

Government of Karnataka

TRAINING MODULE ON
CORPORATE
FINANCE MANAGEMENT

[Non-DLM]

*[20 days Training Module in two phases of 10 days each – Refined
after the validation proceedings]*

With support from
Department of Personnel & Training, Government of India
and
UNDP

ADMINISTRATIVE TRAINING INSTITUTE
Lalitha Mahal Road, Mysore – 570 011

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Note: - Each learning unit contains three portions; (1) Group Activity (2) Reading Material and (3) Instructions to Faculty

Aim:

Value based investment or expenditure is the essence of the Financial Management. Every suitable financial concept must be analyzed and applied from the viewpoint of each stake holder before final decisions are taken. New financial concepts including derivatives, portfolio management etc., are introduced in this training design in order to enable Financial Managers and Senior Executives to arrive at better alternative investment decisions. Analysis of financial portions of economics will also enable them to draft legislation or improve existing legislation to protect the interest of stake holders and to curb the speculations and malpractices.

Therefore, the aim of this training programme is to facilitate practicing Finance Managers from the Finance Department of State Governments and Senior Executives from Administrative Departments to understand and analyze financial statements with a view to taking corporate finance decisions.

Training Need

There is an ever-increasing need to meet the changing scenario in the management of government departments, local bodies, autonomous bodies and PSUs. The changes are felt from the following angles:-

- Public interest
- High quality and understandable documentation
- Uniform internal and external accounting and financial documentation system
- Uniforms internal and external financial rules and regulations
- Enforceable global accounting standards.
- Transparency in financial information and procedures.
- Uniform financial statements from the point of view of effective comparison.
- Uniformity in financial reporting system.
- Introduction of enforceable penal provisions.
- Consultation system to determine high quality solutions.
- Quick availability of financial information, to all.

Implementation of some of the above ideas may take fairly a long time. But the felt need is to prepare the present financial managers and the senior executives for changes in the system with a view to orienting them to improved levels of efficiency and effectiveness.

Phases of Training

To achieve the above aims, training is designed in the following 7 Learning Units in two phases.

Phase-I

1. Basics of Commercial Accounting System including Balance Sheets;
2. Discounted Cash Flow Technique and Internal Rate of returns.
3. Budget, cost and benefits
 - 3.1 Performance budgeting
 - 3.2 Zero Base Budgeting
 - 3.3 Cost Benefit Analysis
4. Management of Capital
 - 4.1 Capital Structure
 - 4.2 Capital budgeting decisions
 - 4.3 Measurement of risk
 - 4.4 Cost of Capital, including CAP-M
 - 4.5 Valuation of Fixed Income Securities
 - 4.6 Valuation of Bonds and Stocks

Phase-II

5. Portfolio Management'
6. Derivatives
7. International Financial Management

Duration

10 days each for each phase of training, totally 20 days.

Target Group

1. Officers from the rank of Deputy Controllers and above from the State Accounts Department
2. Selection Scale KAS officers and IAS Officers having 6 to 9 years experience
3. Senior officers from PSUs and autonomous bodies

Reading and Activity Materials

Reading and group-activity materials on all 7 Learning Units will be supplied to the participants.

Groups may concentrate on the meaning and practicality of the concepts, rather than on difficult portions of mathematics and statistics.

In addition to the above the participants are expected to borrow books from the library on the various aspects of financial management related to the learning units.

Guide to Facilitators/Faculty

The Facilitators/Faculty members may use the “Instructions to Faculty” exclusively designed for this package.

The time for lecture is limited to the extent noted in the Instructions to Faculty. 80% of time is meant for participants, who will learn on their own through group activities, developed in the form questions and answers. Participants will seek solutions to problems. There will be exercises using case studies. In addition there will be problem solving activities. Participants will also be provided material for reading. They will be exposed to techniques for preparing visual aids for more persuasive and effective presentation.

The role of the facilitators will be to guide the participants during group discussion and to moderate the presentations made by each group.

Module for Phase-I

Day-1 Introductory activities

Forenoon Session:

Time & Subject	Activities/Process	Support and Role of Facilitators
10.00- 10.30 am	Registration at ATI Hostel.	
10.30 to 11.30 a.m. Ice Breaking	Introductory activities.	A variety of introductory games are available, including Merry-go-round, Potato Partners, Tell a lie. Facilitator may choose from any of these games to establish rapport with the participants.
11.30 - 11.45 am	Tea/Coffee break	
11.45 am - 12.45 pm Course Objectives Training techniques Group formation	<p>Faculty/Facilitator to explain the facilities available in the Institute as well as the brief background of the training course and spell out the objectives.</p> <p>Faculty may also explain some of the participatory techniques and group activities proposed to be used in the training process.</p> <p>Faculty to also divide participants into four groups based on their experience and background</p>	<p>Faculty to explain the Library, Sports and Club facility available in the ATI campus along with the details of the background of this course.</p> <p>Faculty to explain the advantages of the participatory technique in the form of the Group Activities.</p> <p>Each group will comprise a mix of executives and finance people.</p>
12.45 - 1.30	Participants to visit library to collect books	Faculty and the Chief

pm Visit to library	on Financial Management related to Corporate Finance. Faculty will help participants identify appropriate books and material. Faculty to also familiarize participants with the contents of the handouts provided for the course.	Librarian will assist the participants in the selection of books. .
1.30 - 2.30 pm	Lunch	

Learning Unit - 1

Basics of Commercial Accounting System Including Balance Sheet

OBJECTIVES:

At the end of this Learning Unit the participants will be able to:-

- Classify transactions on the debit side and on the credit side.
- Understand important entries in the subsidiary registers.
- Prepare Trial Balance
- Prepare Trading Account
- Prepare Profit and Loss Account
- Prepare Balance Sheet
- Read balance sheet with some crucial ratios

DAY – 1 contd.
Learning Unit - 1

Afternoon Session:

Time & Subject	Activities/Process	Support and Role of Facilitators
2.30 p.m. to 5.30 p.m. Learning unit – I Basics of Commercial Accounting and Balance Sheet	<p>Commencement of LU-1</p> <p>Brief presentation on the objectives of LU-1: Basics of Commercial Accounting and Balance Sheet.</p> <p>‘Story telling’ on starting of business with details of (i) own capital (ii) loan and transactions related to ‘personal accounts’, ‘asset accounts’, ‘Nominal accounts’, ‘trading and profit and loss account and balance sheet’ summing up of the first day proceedings.</p>	<p>Faculty to use the 'Instructions to Faculty' in L.U -1 as guide for the initial presentation</p> <p>Faculty should demonstrate transactions under each sub-unit with examples.</p>

DAY – 2
Learning Unit - 1

<p>9.30 to 5.30 pm</p> <p>Basics of Commercial Accounting and Balance Sheet</p> <p>Understanding the contents of reading materials</p> <p>Assignment of frames to groups</p>	<p style="text-align: center;">Group Activities:</p> <p>Recap on the first day proceedings. Before commencement of group activities each participant will be provided time to go through the reading material on LU-1</p> <p>Group activities will be carried out as per the instructions in the Handout on “Group Activity LU-1, which will be supplied to each participant.</p>	<p>Faculty to clarify doubts, if any, with reference to contents of reading material.</p>
<p>Frame details</p>	<p>The tasks assigned to the 4 groups will be as follows</p> <ul style="list-style-type: none"> • Group A will deal with frames 1, 2 and 3 • Group B will deal with frames 4, 5 and 6 • Group C to deal with frame 7 • Group D to deal with frame 8 <p>Frame 1: Questions on Accounts classification Frame 2: Questions on Accounts records Frame 3: Trial balance: Practicals Frame 4: Trading Account: Practicals Frame 5: Profit and loss account: Practicals Frame 6: Preparation of Balance Sheet: Practicals Frame 7: How to read Balance Sheet: Practicals Frame 8: Practicals on using ratios and formulas</p> <p>Based on their discussions, groups will prepare visual aids specific to the frame allotted to them for presentation on the following day. Summing up of the proceedings of Day 2</p>	<p>Clarify the activities to be undertaken with reference to each frame</p> <p>Explain the details in each frame.</p> <p>Option will be given to the participants to use any medium for presentation, including LCD-Power point presentation.</p>

Day 3
Learning Unit - 1

Forenoon and afternoon Sessions:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.	Recap on the proceedings of the second-day.	
Basics of Commercial Accounting and Balance Sheet	Presentations by participants on LU-1 “Basics of Commercial Accounting and Balance Sheet”	Moderation by faculty
Presentations by groups		
Learning Points	Listing Learning points on LU-1	
	Summing up of the proceedings of Day 3.	

Discounted Cash Flow Technique and Internal Rate of Return

Objectives:

At the end of this learning unit, the participants will be able to:

- Calculate the present value of money receivable in future.
- Use the SPPWF and USPWF tables to calculate the PV of cost and returns.
- Find out the most economical decision
- Calculate the net present value
- Calculate the internal rate of returns

Day -4.
Learning Unit - 2

Forenoon and Afternoon Sessions:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 p.m. to 5.30 p.m. Recap	Recap on LU-1 with reference to 10 key questions as listed in LU-2 (instructions to faculty)	Help participants make a recap on LU- I
DCFT and IRR	Commencement of LU-2	Explanation on DCFT and IRR Faculty may use the 6 visual aids and graph while explaining DCFT and IRR. (Refer to reading material in LU-2)
	Discounted Cash Flow Technique and Internal rate of return	
	Faculty to make a brief explanation on: <ul style="list-style-type: none"> • Meaning and objective of DCFT • How to use the SPPWF and USPWF tables • Calculation of IRR with formulae <div style="border: 1px solid black; padding: 2px; text-align: center;">Group activity</div>	
	Application of DCFT	
Calculation of IRR	Group I and II should apply DCFT to make purchase decisions Group III and IV to calculate the IRR to assess the viability of the given project Groups to use the SPPWF and USPWF tables for application and calculation of DCFT and IRR Groups to refer to the reading materials for calculation Based on their discussions, groups will prepare visual aids specific to the frame allotted to them for presentation on the following day. Summing up of the 4 th day proceedings.	Faculty to explain on “how to use the tables and reading materials” for calculation and application purpose. Option will be given to the participants to use any medium for presentation, including LCD-Power point presentation.

Day 5
Learning Unit - 2

Forenoon and afternoon Sessions:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 11.30 a.m. Recap DCFT and IRR contd.	Recap on the proceedings of Day 4. Continuation of discussion and preparation of visual aids by the groups for the presentation on exercises relating to DCFT and IRR.	Moderation by Faculty
11.45 a.m. to 5.30 p.m. DCFT and IRR contd. Presentations	Presentation on DCFT and IRR by the groups and moderation by Faculty Listing of learning points on LU-2 Summing up of the 5 th day proceedings.	Summing up of L.U.2

Budget

Sub-Units

- A. Performance Budgeting
- B. Zero Base Budgeting
- C. Cost-benefit analysis

Sub Unit 'A'

Performance Budgeting

Objectives :-

At the end of the learning unit, the participants will be able to:

- Understand the meaning, concept and framework of Performance Budgeting
- Design responsibility centers by linking financial inputs to outputs.

Sub Unit 'B'

Zero Base Budgeting

Objectives:-

At the end of this learning Unit, the participants will be able to:

1. List the steps to be followed for the preparation of Zero Base Budgeting
2. Identify the decision units and the decision packages
3. Identify and rename the redundant expenditure
4. Rationalize expenditure by removing repetitive expenditure items
5. Design decision packages
6. Review the necessity of continuance of on-going expenditure
7. Determine the different levels of funding
8. Use ranking methods for prioritization of decision packages.

Cost Benefit Analysis

Objectives:-

At the end of this learning Unit, the participant will be able to:

- List out and value utility costs and benefits
- Undertake compensation analysis
- Comprehensively use the Externalities Theory in respect of social goods
- Identify and use social rate of discount for cost benefit analysis
- Undertake risk and uncertainty analysis for decisions with reference to a social projects
- Undertake cost benefit analysis with reference to given cases

Day 6
Learning Unit - 3

Forenoon and Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on day-5 proceedings	
Performance Budgeting, Zero Base Budgeting and Cost Benefit Analysis	<p>Commencement of LU-3</p> <p>Faculty to make a brief presentation on the conceptual frame work of Performance Budgeting (PB), Zero Base Budgeting (ZBB) and Cost Benefit Analysis (CBA).</p> <p><u>Group Activity on LU-3 A</u></p>	Brief explanation by faculty on PB, ZBB and CBA
Designing a responsibility centre	<p>The first group to select and design a responsibility centre. They may use the checklist given in the reading materials</p> <p><u>Group Activity on LU-3 B</u></p>	
Designing a decision package	<p>The second group will select and design a decision package under ZBB.</p> <p><u>Group Activity on LU-3 C</u></p>	Faculty to guide the groups regarding designing of responsibility centres and decision packages
Case study: CBA	The third group and the forth group will do the CBA on the case study “The Damodar Valley Flood Control Scheme”	Faculty to ask the participants to ignore the difficult portion of mathematics and only to concentrate on internalities and externalities
Case study: CBA	<p>The reading material will provide sufficient information to the groups.</p> <p>Group work to continue in the afternoon. Visual aids to be developed by the groups for presentation.</p> <p>Summing up of the 6th day proceedings</p>	

Day – 7
Learning Unit - 3

Forenoon and afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.	Recap on 6 th day proceedings	
Recap	Groups I & II to complete the presentations on designing a Responsibility centre and decision package before the end of the Day-6.	Moderation by faculty
CBA Presentations	Group III and IV to make presentations on CBA	
Learning points	Listing of learning points by the groups Each group will list out at least 5 learning points on Performance Budgeting, Zero Base Budgeting and Cost Benefit Analysis	Summing up of LU-3
	Summing up of the 7 th day proceedings (L.U.3)	

Learning Unit - 4

Capital Management

Objectives :-

At the end of this learning unit the participants will be able to:

01. Understand the nature of investment decision.
02. Value the estimated future benefits that will accrue to the firm over a series of years.
03. Understand the implications of long-term investments.
04. Apply the steps of investment evaluation criteria methodically.
05. Work out, to accept or reject a investment proposal.
06. Use pay back period as a method of evaluating investment proposal.
07. Evaluate both the lending and borrowing type projects.
08. Build the relationship between profitability and risk.
09. Describe basic risk concepts.
10. Incorporate risk analysis in the capital budgeting proposals.
11. Do the calculation of cost of equity capitals.
12. Adopt CAPM approach for computing the cost of equity.
13. List the merits and demerits of the CAPM approach.
14. Calculate weighted average cost of capital.
15. Determine the cost of equity capital of the company.
16. Establish relationship between leverage and in the cost of capital.
17. Critically appraise the traditional approach and the Modigliani-Miller approach to the problems of capital structure.
18. Establish relationship between capital structure and the value of firm.
19. Define capital structure, appropriate capital structure and flexible capital structure.
20. Employ yield measures like current yield, yield to maturity, yield to call and realized yield to maturity.
21. Stock valuation by using dividend discount model.
22. Understand the DEMAT systems and the working of depository system in India.

Day- 8.
Learning Unit - 4

Forenoon and Afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
<p>9.30 p.m. to 5.30 p.m.</p> <p>Capital Management</p> <ul style="list-style-type: none"> • Investment criteria • CAPM • MM • WACC • Valuations • Risk measurement • Capital budgeting <p>Assignment of tasks to groups</p>	<p style="text-align: center;"><u>Recap on L.U.3</u> <u>Commencement of LU-4</u></p> <p>Faculty to make a brief presentation to explain concepts of investment criteria, CAPM approach, MM approach, WACC, valuations, risk measurement DEMAT system and the working of depository system in India; and capital budgeting.</p> <p style="text-align: center;"><u>Group Activities</u></p> <p>The existing four groups will be converted into 3 groups</p> <p>Each group will be assigned with two sub-units Group 1: (a) Capital structure analysis, (b) Capital structure Decisions</p> <p>Group 2: (a) Measurement of risk (b) Cost of capital, including CAPM.</p> <p>Group 3: (a) Valuation of fixed income securities, (b) Valuation of bonds and stocks</p> <p>Based on the books borrowed from the library and the reading materials, the groups will have discussion with reference to: (a) conceptual clarity, (b) meaning, (c) utility or scope for application, (d) illustrations and examples.</p>	<p>Faculty to preferably use the 9 visual aids provided in the reading material for LU-4. Details should be explained as per contents in the handout on 'Instructions to faculty on Capital Management'.</p> <p>Faculty to supply the reading materials a day in advance.</p> <p>Faculty/facilitator to guide the groups on the reading material available for reference.</p> <p>Focus to be on 24 questions listed in the Handout on Capital Management in LU-4.</p> <p>Faculty to give clues to the references for the 24 questions.</p>

Day- 9.
Learning Unit - 4

Forenoon and Afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 p.m. to 5.30 p.m.	Recap on 8 th day proceedings Group activities to be continued on Day-9.	

Day 10
Learning Unit - 4

Forenoon & Afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m. Re-Cap	Recap on the proceedings of the Capital Structure presentation by Group 1 on Capital Structure Analysis and Capital Structure Decisions.	
Risk Measurement and Cost of Capital, including CAPM	Group 2 to make presentation on Risk Measurement and Cost of Capital, including CAPM, followed by plenary discussion and moderation by the Faculty.	Moderation of Group Presentation by Faculty
Valuation of Fixed Income Securities and Bonds and Stocks	Group 3 to make presentation of Valuation of Fixed Income Securities and Valuation of Bonds and Stocks followed by plenary discussion and moderation by the Faculty.	
Learning points on Capital management	The 10 learning points on each sub-unit, namely Capital Structure, Capital Structure Decisions, Risk Measurement, Cost of Capital, including CAPM, Valuation of Fixed Income Securities and Valuation of Bonds and Stocks will be listed by the participants at the end of the 10 th day for reinforcement. Summing up by the Faculty	Summing up on L.U.4
	<ul style="list-style-type: none"> • Internal evaluation • Briefing on Phase-II training • Certificate Distribution and Goodbyes. 	

Training Module on Corporate Finance Management

Phase 2

10 days

With support from
Department of Personnel & Training, Government of India
and
UNDP

**Administrative Training Institute
Lalithmahal Road, Mysore**

Contents

1. Portfolio Management
2. Derivatives
3. International financial Management

{Note: The Second Phase Training is meant for the participants, who have undergone training in the first phase}

Module for Phase – 2

Day-I Introductory activities

Forenoon & Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 to 10.30 a.m.	Registration for the participants of Phase-2 training at ATI Hostel.	
10.30 a.m. to 1.45 p.m.	<p>Detailed re-cap on Phase-1 training. Presentation by the four groups on each of the following learning units of phase-1.</p> <ul style="list-style-type: none"> • Basics of Commercial Accounting and Balance Sheet • Discounted Cash Flow Technique and Internal • Rate of Return • Budget • Capital Management 	
2.30 pm to 5.30 pm	<ul style="list-style-type: none"> • Expectations of the participants from phase-2 training and its analysis • Briefing on the objectives and the utility of phase 2 training • Distribution of reading materials and group activities related to the Phase- 2 Learning Units • Visit to the Library to collect books and journals on topics incorporated in Phase-2 Learning Units. <p>Summing up of the proceedings of Day-1.</p>	<ul style="list-style-type: none"> • Facilitator to analyze the expectations of the participants. • Facilitators to explain the salient features of the phase-2 training. • Facilitator to explain how to use the reading materials and books to carry out the group activities effectively. • Facilitator to assist the participants in the selection of books.

Portfolio Management

Objectives :

At the end of this learning unit, the participants will be able to;

- Interpret the basic principles required for designing, analyzing and managing a portfolio
- Forecast the future share price movements
- Identify the factors that influence financial performance of companies.
- Decide the proportions of the total funds that should be invested in each security.
- Take decisions on asset allocation and on the choice of securities within each broad category of asset.
- Revise portfolios based on changes in the prices of securities.
- Evaluate portfolio performance.

Day - 2
Learning Unit - 5

Forenoon & Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on the proceedings of Day-1.	
	Commencement of LU-5	
Portfolio Management	<p>Faculty to initiate the session with a brief presentation on stock exchange, technical analysis and charting of stock prices; modern portfolio theory; asset allocation and portfolio design and evaluation of portfolio performance.</p> <p style="text-align: center;">Group activities</p> <p>Four groups will be formed. Groups will be assigned the following topics:</p> <p style="padding-left: 40px;">Group 1: Firm specific analysis Group 2: Modern Portfolio theory Group 3: Asset allocation and portfolio design. Group 4: Evaluation of portfolio performance.</p> <p>Participants to develop visual aids for the presentations.</p>	<p>Faculty/facilitator may use the 10 visual aids specified in the handout on 'Instructions to Faculty on Portfolio Management' in LU-5.</p> <p>The focus for discussion should be on the points specified in the handout for Group Activities in Learning Unit-5.</p> <p>Reading material on the topics for group discussion will be made available to the participants in advance. Each participant will be required to study the material for participation in group discussion on financial issues, detailed calculations, implications and decisions.</p> <p>Faculty may ask the participants to ignore the difficult mathematical portions.</p>
Assignment of topics		

Day - 3
Learning Unit - 5

Forenoon & Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
	<ul style="list-style-type: none">• Recap on the Day-2 proceedings• Group Activities on L.U.5 will continue for the entire day.• Summing up of the Day-3 proceedings.	

DAY 4
Learning Unit - 5

Forenoon and afternoon Sessions:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on the proceedings of Day 2 and 3	
Firms specific analysis	Presentation by the group 1 on 'firm specific analysis'	Moderation by the Experts based on the presentation by the Participants.
Modern Portfolio theory	Plenary discussion by participants and moderation by faculty.	
Asset Allocation and Portfolio Design	Presentation by the Group 2 on 'Modern portfolio theory';	
	Presentation by Group 3 on 'Asset allocation and portfolio design'	
	Presentation by Group 4 on 'Evaluation of, portfolio performance'.	
	Plenary discussion by participants and moderation by faculty.	
	Listing of learning points arising from the presentations and discussions.	
	Summing up by Faculty	

Derivatives

At the end of this learning unit, the participants will be able to:

01. Understand the rationale of risk management.
02. Understand the background on derivatives.
03. Understand option theory.
04. Use complex option pricing model and the Black-Scholes model.
05. Understand forward contracts, futures and swaps.
06. Use derivatives to reduce risks.

Forenoon and Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
<p>9.30 p.m. to 5.30 p.m. Recap Derivatives</p> <p>Group tasks</p>	<p style="text-align: center;">Recap on L.U.5 Commencement of LU-6</p> <p>Faculty to make a brief presentation on the meaning and background of derivatives as well as option pricing models including the black schales option pricing model and using derivatives to reduce risk.</p> <p>All groups will be asked to read the key concepts and case studies on derivatives provided in the reading material in LU-6 and to respond to the questions following the material.</p> <p>Summing up of the 5th day proceedings.</p>	<p>As this is a new subject, every care should be taken to explain basic definitions with simple examples.</p> <p>Faculty may use the 7 visual aids indicated in the handout “Instructions to Faculty” in LU-6.</p>

Day 6
Learning Unit - 6

Forenoon and afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m. Recap Derivatives Focus on questions and mini cases	<p>Recap of the proceedings of Day 5.</p> <p>Group activities contd.</p> <ul style="list-style-type: none"> • All groups will have to go through the reading material and/or available books related to this topic. • Participants will be supplied with reading materials and brief summary on derivatives. • After studying the material provided, each group will be expected to answer the questions following the reading material and the two mini cases (as per details in the handout 'group activity on derivatives' in LU-6). • Participants to develop visual aids to do the presentation. 	<p>Explain the importance of questions and mini cases</p>
	Summing up of the proceedings of Day 6.	

Day 6
Learning Unit - 6

Forenoon and afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.	Recap of the proceedings of Day 6. Presentations, discussions, moderation and listing of learning points. Summing up of the proceedings of Day-6.	Moderation and summing up.

Learning Unit - 7

International Financial Management

Objectives:-

At the end of this learning unit, the participants will be able to:

01. Prepare statements of balance of payments.
02. Acquire the skills of conversion rates, by bid price, ask price and spread
03. Workout the arbitrage possibilities.
04. Calculate expected exchange rate.
05. Understand the various exchange rate theories.
06. Work on 'covering exchange rate risk' with reference to appreciation, depreciation, hedging and translation exposure.
07. Calculate the interest rate risk under different situations.
08. Recommend regarding procurements, manufacturing and viability based on the case studies.
09. Understand the financial systems in the Euro currency market.

Day 8
Learning Unit - 7

Forenoon and afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on L.U.6.	
	Commencement of LU 7 International Financial Management.	
International Financial Management	Faculty to make a brief presentation on BOP, exchange rate theories, hedging and translation exposure, currency adjustment, IMF and IBRD functions, EMS, Foreign exchange market Euro currency market and risks in international operations.	Faculty to use the visual aids indicated in the handout “Instructions to Faculty” in LU 7.
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Group activity:</div>	
Focus on 15 problems and two cases	<ul style="list-style-type: none"> • Group work will be assigned to the existing 4 groups. • Participants will be required to read/study the reading materials in LU 7 and to use references to solve specific problems. • 15 problems and 2 case studies will be supplied to the participants (the details are available in the handout on ‘group activities’ in LU-7) 	
Case on guns Case on helicopters.	<p>As far as the case studies are concerned, the groups must make specific recommendations about the manufacture and purchase of guns, and hiring or purchasing of helicopters along with financial implications.</p> <p>Groups will develop visual aids for presentations.</p> <p>Summing up of the 8th day proceedings.</p>	

Day 9
Learning Unit - 7

Forenoon and afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
	Recap on the proceedings of Day 8. Group activities on L.U.7 will continue on Day 9. Summing up of the Day 9 proceedings.	

Day 10
Learning Unit - 7

Forenoon and afternoon Sessions:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 1.30 p.m. Recap International Financial Management Presentation	Recap on the proceedings of Day 9. Presentations, discussions, moderations listing of learning points and summing up.	Moderation and summing up
2.30 p.m. to 5.30 p.m. Conclusion	Summing up of LU-7 by the participants. Internal evaluation/good byes	

LEARNING UNIT - I

**BASICS OF COMMERCIAL
ACCOUNTING
AND BALANCE SHEET**

GROUP ACTIVITIES

Administrative Training Institute
Lalitha Mahal Road, Mysore - 570 011

Group Activities

Learning Unit 1

1. Basic Instructions to Participants

- 1.1. The objective of the group activities is to enable each participant to acquire to skills specified in the objectives of Learning Unit 1.
- 1.2. It is necessary that participants acquire in-depth knowledge in each frame of this Learning Unit. Faculty will attempt to ensure that this knowledge is transformed into a skill during the group activity.
- 1.3. Participants may refer to the reading material provided and the books borrowed from Library for the group activities.
- 1.4. Participants will be required to prepare visual aids on each frame on key points listed. Representatives of the groups will make presentations.
- 1.5. Each group will be given 30 minutes for presentation. Faculty members will moderate the presentation.

2. Group Tasks

- 2.1. Tasks will be assigned to all four groups in the form of Frames, which follow this section. There are a total of eight frames, each dealing with the Basics of Commercial Accounting and Balance Sheets. The frames are in the form of simple questions; fill in the blanks, true/false. There are also questions which require analysis and problem solving. Groups will be asked to discuss and solve the issues/ questions given in the different frames:
 - Group A will deal with Frames 1,2 and 3.
 - Group B will deal with Frames 4, 5 and 6.
 - Group C will deal with Frame-7.
 - Group D will deal with Frame-8
- 2.2. Each group will be given sufficient time to discuss to find answers/solutions for each frame and to prepare visual aids for presentation. Requisite stationery required for making visual aids will be provided. Participants may also opt for making Power Point presentations. This task will be completed on the first day itself. If necessary, the participants may continue their discussions and prepare visual aids for presentation by working in their

hostel rooms in the evening, if the class time is not sufficient. Groups which complete their task early may assist the other groups.

- 2.3. Presentations will be made in the forenoon session on the next day. At the end of the presentation each group will list important learning points for reinforcement.

3. The Frames

(Questions and Problems are taken out from the book 'Fundamentals of Double entry and Book Keeping' by Prof. J.R. Batliboi)

Frame-1

Answer the following and fill in the blanks:

- (1) Accounts can be classified into three. They are:

(i) _____

(ii) _____

(iii) _____

- (2) Ledger Account has two sides. The left hand side is called _____ side and right hand side called as _____ side.

- (3) The debiting and crediting procedure followed in personal accounts are
(a) _____ (b) _____

- (4) The debiting and crediting procedure followed in Asset accounts are (a) _____
(b) _____

- (5) The debiting and crediting procedure followed in nominal accounts are

(i) -----

(ii) -----

- (6) If Mr. A sell goods worth Rs.500/- to Mr. B on credit basis, which accounts are affected in the books of Mr. A? How is it affected, and why? Similarly how will the accounts be treated in the books of Mr. B?

- (7) If Mr. A sells the goods worth Rs.200/- on cash payment to Mr. B, how will you treat the accounts in the books of Mr. A and in the books of Mr. B?

(8) On the deposits of Mr. 'X', the Bank paid an interest of Rs.250/-. How will you account for the interest in the book of Mr. X ?

Frame - 2

Answer the following questions and fill in the blanks

- 1) Make a list of subsidiary records and indicate the purpose for which they are maintained in an organisation.
- 2) Discount is an _____ account. Therefore, when a discount is received it shall be _____ and when discount is given to others it shall be _____
- 3) When a Self Cheque is drawn, the cash column in the Bank shall be _____ and _____ column will be credited in the cash book
- 4) The excess of debit over credit is _____ balance.
- 5) The excess of credit over debit is _____ balance.
- 6) The debit balance should be posted on the _____ side of its account.
- 7) The credit balance should be posted on the _____ side of the account.
- 8) The LF stands for _____
- 9) The letter 'C' in cash book stands for _____ meaning _____
- 10) The Cash Account in cash book must always show _____ balance.
- 11) The credit balance of Bank Account in Cash Book means _____

True or false/ Agree or Disagree:

- 12) When a cheque is issued to a party debit the bank column and credit the cash column. (True or false) If incorrect, what are the correct entries and how should they be recorded in the Cash Book.
- 13) One must always go for major cash transaction in the Office, instead of going for transactions through Bank. (Agree or disagree) Give reasons for your answer.

Frame 3

Theoretically, you have understood how Trial Balance is prepared.

The Faculty has also explained to you with examples how Trial Balance is prepared by taking into account all the Ledger Account Balances.

Now with reference to the following prepare a Trial Balance in your group

R. Row's Capital Account	--	1,50,000
Land and Buildings Account	--	55,000
Plant and Machinery account	--	85,000
Furniture and Fixture account	--	2,500
Motor Vans Account	--	15,750
Bills Receivable Account	--	4,000
Bills Payable Account	--	5,000
Factory Wages	--	12,200
Salaries to Staff	--	4,500
Rent and Taxes	--	1,700
Lighting and Power	--	900
Coal and Fuel	--	600
Trade Expenses	--	575
Commission	--	2,700
Duty and Clearing charges	--	1,260
Stock, on 1st April 1970	--	50,450
Purchases	--	96,000
Sales	--	1,65,000
Returns Inwards	--	2,100
Bank Charges	--	125
Travelling Expenses	--	3,750
Advertising	--	2,115
Repairs to Plant	--	1,070
Loan from Multi Bros.	--	25,000
Interest on Loan	--	960
Cash at Bank	--	6,400
Cash on Hand	--	300
Petty Cash Balance	--	75
R. Row's Drawings	--	6,000
Sundry Debtors	--	85,420
Sundry Creditors	--	88,650

Frame 4

Prepare a Trading Account, with the following details.

Sales	--	32,000
Returns inwards	--	2,000
Closing Stock	--	9,000
Stock at commencement	--	7,500
Purchases	--	16,000
Return outwards	--	400
Carriage inwards	--	400
Duty and Clearing	--	1,500

Frame 5

Prepare a Profit and Loss Account with the following details. The Gross Profit is Rs.1,88,906.

Salaries	--	31,930
General Expenses	--	16,284
Carriage outwards	--	4,300
Insurance and taxes	--	8,350
Stable expenses for distribution	--	4,946
Discount paid	--	1,856
Interest and Bank charges	--	950
Old Reserve	--	4,000
Reserved for bad and doubtful debts	--	7,814
Bad Debts	--	2,970
Plant and Machinery:	--	
Depreciation	--	3,944
Fixtures and fittings :		
Depreciation	--	948
Houses and carts	--	2,000

Commission:

- a) Works manager at 1% of Rs.1,88,906
- b) General Manager at 5% of Rs.1,05,704

Frame : 6

Based on the Frame 5, i.e., after preparing Profit and Loss Account, prepare a Balance Sheet with the following additional information.

Capital	--	1,60,000
Bank Loan	--	20,000
Creditors on open accounts	--	1,08,320
Outstanding Liabilities	--	7,174
Good will	--	60,000
Free hold works	--	50,000
Plant & Machinery	--	39,440
Fixtures and Fittings	--	18,960
Houses & Carts	--	10,330
Stock in Trade	--	59,260
Sundry Debtors	--	1,56,280
Reserve for doubtful debts	--	7,814
Expenses prepaid	--	980
Cash at Bank	--	15,080
Cash in hand	--	290

Frame 7

Skills to Read Balance Sheet

The balance sheet given below will be discussed in groups and presentation made on key points with reasons.

Khadi Udyog Balance Sheet

(This portion taken from the book 'How to read Balance Sheet' – an ILO Programme Book)

Liabilities	Rs.	Assets	Rs.
Money Subscribed by Shareholders	7,000	Land, Buildings etc.,	21,000
Long Term Loan owed to financial institution	16,000	Raw Materials etc.,	7,000
Bank over draft	5,000		
Total		Total	

Focus will be on reading financial health of the organisation with reference to liquidity, profitability, stability, credibility and activity ratios.

Fill in the blanks and answer the following questions:

Level One:

- (a) The balance sheet table relates to the assets and liabilities of _____.
- (b) Balance sheet must always _____.
- (c) _____ show the source of money and _____ show how the money is used.
- (d) In this balance sheet _____ is missing.
- (e) Can the skills of highly trained technicians be expressed in monetary terms and shown in a Balance Sheet?
- (f) What are the supporting documents required to read a Balance Sheet ?

Level Two:

- (a) Assets can be grouped into _____ and _____
- (b) Current assets can be grouped into _____ and _____
- (c) Give examples for fixed assets
- (d) Cash in banks and in hand are called _____ assets
- (e) Inventories are quick assets (correct/incorrect)
- (f) Assets intended for long term use are _____ assets
- (g) Fixed assets vary on day-to-day basis (correct/Incorrect)
- (h) What is an operating Cycle ? The operating cycle will normally be less than _____ year.
- (i) Assets which can be converted into cash within the operating cycle is called as _____ assets.
- (j) Finished product stocks are _____ asset.
- (k) Raw materials are _____ asset
- (l) Work-in-progress are _____ asset
- (m) Account receivable are _____ asset
- (n) Marketable securities are _____ asset.

Level Three:

- (a) Current asset are more liquid than _____ assets
- (b) Cash is a _____ asset

Level Four:

- (a) How do you value inventories ?
- (b) How do you value the fixed assets like :
 - (i) Buildings
 - (ii) Plant and machinery

- (iii) Vehicles
- (iv) Land

(c) If assets are over valued what are the consequences ?

Level Five

- (a) The depreciation and provision for doubtful items increase/reduce the value of the assets.
- (b) Marketable securities are shown on the _____. In balance sheets they should be indicated as _____

Level Six:

- (a) Fixed assets are valued at _____ less _____
- (b) Goods will be a _____ asset arising from the _____

Level Seven:

- (a) _____ liabilities shall be met within one year.
- (b) Long-term liabilities are known as _____ liabilities
- (c) Debenture is a _____ term loan

Level Eight:

- (a) What is the difference between the 'Capital Authorised' and the 'Capital Subscribed'?
- (b) Who are the owners of the company ?
- (c) Share holders will be paid interest (Correct/incorrect)
- (d) What will be paid to the share holders ?
- (e) Portion of the profit retained by the Company called as _____
- (f) What is the difference between the revenue reserve and capital reserve
- (g) For what purpose can a company retain a portion of profits in the form of revenue reserve ?
- (h) Why is dividend to share holders not be paid from Capital Reserve ?
- (i) Does shareholders funds have to be returned ? If so, when ?
- (j) Profit out of sale of fixed assets is _____ reserve.
- (k) What is the difference between the ordinary shares and the preference shares ?
- (l) What compensation will shareholders get at the time of winding up a company?
- (m) Increased value from the revaluation of fixed assets is called _____ reserve.

Level Nine:

- (a) What are outside and inside liabilities?
- (b) When enterprise can be called as solvent ?
- (c) If assets are greater than outside liabilities; what does it reflect?
- (d) How do you measure liquidity ?

- (f) If current liabilities are less than current assets; what does it reflect?
- (g) What is net working capital
- (h) What is gearing? If gearing is 4:1 what does it reflect? If gearing is 1:4, what does it reflect?
- (i) Why should the balance sheet of the current year be compared with the balance sheet of the previous year? What statement can be prepared from the comparison?
- (j) How can sources and uses of funds be prepared?
- (k) What are the sources of new funds? Give examples.
- (l) For what purpose can new funds be used? Give Examples.
- (m) Can money actually leave the business on account of depreciation shown in Profit and Loss Account? Yes or No. Give reasons

Level Ten:

- (a) What is solvency ratio? What does it indicate?
- (b) What does high solvency ratio indicate? What does low solvency ratio indicate?
- (c) What is Current ratio? What does it measure?
- (d) What is quick ratio? What does it measure?
- (e) If current ratio is less than 1:1, what does it indicate? If the current ratio is greater than 1:1, what does it indicate?
- (f) _____ is more important than profit

Level Eleven:

- (a) Gross profit =
- (b) Operating profit =
- (c) Profit before tax =
- (d) Net profit after tax =
- (e) Return on capital employed can be calculated by using formula =
- (f) Return on share holders funds will be measured by using formula =
- (g) Total assets - Current liabilities = _____
- (h) Capital employed is equal to shareholders fund + _____

Level Twelve:

- (a) What are the limitations of Balance Sheet?
- (b) Whether balance sheet reveals the picture regarding stability?

Frame. 8

Calculate the following for the years 1990 and 1991 using figures in the balance sheet and Profit and Loss Account given below:

- (a) Return on Capital employed
- (b) Current Ratio;
- (c) Debt/Equity Ratio;

- (d) Fixed Assets Turnover Ratio;
- (e) Inventory Turnover Ratio ;
- (f) Earnings Per Share; and
- (g) Dividend Cover.

Balance Sheet as at 31st December

	(Rs. in lakhs)		
	<i>1989</i>	<i>1990</i>	<i>1991</i>
<i>Liabilities</i>			
Share Capital:			
Shares of Rs. 10 each	800	1,000	1,000
Reserves and Surplus	700	800	1,000
Secured Term Loans	800	2,000	2,400
Cash credits from banks	800	1,000	1,500
Sundry Creditors	1,200	900	1,100
	<u>4,300</u>	<u>5,700</u>	<u>7,000</u>
<i>Assets :</i>			
Fixed Assets :			
	2,800	3,000	4,000
<i>Less:</i> Depreciation	920	1,400	2,000
	<u>1,880</u>	<u>1,600</u>	<u>2,000</u>
Stock	1,520	2,400	2,800
Debtors	480	500	900
Other Current Assets	420	1,200	1,300
	<u>2,420</u>	<u>4,100</u>	<u>5,000</u>
Total Assets	<u>4,300</u>	<u>5,700</u>	<u>7,000</u>

Extracts from Profit and Loss Account as on 31st December

	(Rs in lakhs)	
Particulars	1990	1991
Sales	4,800	7,200
Profit before depreciation and interest on term loans	1,500	2,400
Depreciation	480	600
Interest on term loans	420	600
Tax	300	600
Dividends	100	150

Solution to Frame 8:

Note: At the end of group discussion, this portion shall be supplied to enable the participants to compare their answers.

	1990	1991
Computation of Ratios:		
(a) Return on Capital Employed:		
$\frac{\text{Profit before interest, \& Tax}}{\text{Average Capital Employed}} \times 100$	$= \frac{1020}{3050} \times 100 = 33.44\%$	$= \frac{1800}{4100} \times 100 = 43.90\%$
(b) Current Ratio:		
$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	$= \frac{4100}{1900} = 2.16$	$= \frac{5000}{2600} = 1.92$
(c) Debt Equity Ratio:		
$\frac{\text{Debt}}{\text{Equity}}$	$= \frac{2000}{1800} = 1.11$	$= \frac{2400}{2000} = 1.20$
(d) Fixed Assets Turnover Ratio:		
$\frac{\text{Sales}}{\text{Average Fixed Assets (Net)}}$	$= \frac{4800}{1740} = 2.76 \text{ times}$	$= \frac{7200}{1800} = 4.00 \text{ times}$
(e) Inventory Turnover Ratio:		
$\frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$	$= \frac{3300}{1960} = 1.68 \text{ times}$	$= \frac{4800}{2600} = 1.85 \text{ times}$

(f) **Earnings per share :**

Profits available for equity shareholders	300	600
----- =	----- = Rs.3	----- = Rs.6
Number of Equity Shares	100	100

(g) **Dividend Cover:**

Profits available for equity shareholders	300	600
----- =	----- = Rs.3	----- = Rs.4
Dividend for Equity shareholders	100 times	150 times

(Rs. in lakhs)

1989 1990 1991

Working Notes:-

(1) Capital Employed:

Total Assets	4,300	5,700	7,000
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Less: Current Liabilities:

Cash Credit from Banks
Sundry creditors

800	1,000	1500
<u>1,200 - 2000</u>	<u>900 - 1900</u>	<u>1100 - 2600</u>

Average Capital employed

$\left(\frac{2300 + 3800}{2} \right)$	$\left(\frac{3800 + 4400}{2} \right)$
= 3,050	= 4,100

(2) Debt:

Secured Term Loans:	<u>2,000</u>	<u>2,400</u>
---------------------	--------------	--------------

(3) Equity:

Share Capital	1,000	1,000
Reserve & Surplus	<u>800</u>	<u>1,000</u>
	<u>1,800</u>	<u>2,000</u>

(4) Current Assets:

Stock	2,400	2,800
Debtors	500	900
Other Current Assets	<u>1,200</u>	<u>1,300</u>
	<u>4,100</u>	<u>5,000</u>

(5) Current Liabilities:

(As per WN 1)

1,900	2,600
-------	-------

(6) Inventory (Stocks)	1,520	2,400	2,800
Average Inventory	$\frac{1520 + 2400}{2}$	$\frac{2400 + 2800}{2}$	
	=	1,960	= 2,600
(7) Profit before Interest and Tax:			
Profit before Depreciation and Interest on Term Loan	1,500	2,400	
Less: Depreciation	<u>480</u>	<u>600</u>	
	<u>1,020</u>	<u>1,800</u>	
(8) Profits available for Equity Shareholders:			
Profit before Depreciation and Interest on term loan	1,500	2,400	
Less: Depreciation, Interest on Term Loan and Tax	<u>1,200</u>	<u>1,800</u>	
	<u>300</u>	<u>600</u>	
(9) Cost of Goods Sold:			
Sales	4,800	7,200	
Sales: Profit before Depreciation and Interest on Term Loan	<u>1,500</u>	<u>2,400</u>	
	<u>3,300</u>	<u>4,800</u>	
(10) Fixed Assets (Net)	1880	1,600	2,000
Average Fixed Assets (Net)	$\frac{1880 + 1600}{2}$	$\frac{1600 + 2000}{2}$	
	=	1,740	= 1,800

LEARNING UNIT - I

**BASICS OF COMMERCIAL
ACCOUNTING
AND BALANCE SHEET**

READING MATERIAL

**Administrative Training Institute
Lalithamahar Road, Mysore - 570 011**

Basics of Commercial Accounting and Balance Sheets

1. Accounting Policy

- 1.1. An organization must have a policy regarding accounting procedure, valuation of assets and documentation for the purpose of consistency, transparency, uniformity and accountability.

2. Focus

- 2.1. One of the basics of Commercial Accounts is the double-entry system. The fundamentals of double entry will focus on :-

- Classification of Accounts and the meaning of debit and credit
- Journal entries
- Subsidiary Accounts
- reconciliation of accounts with Bank
- Trial balance.
- Trading Account
- Manufacturing Account
- Adjusting entries and closing entries
- Profit and loss account
- Balance Sheet

- 2.2. The learner must understand the salient features of the sub-units listed above. The objective is to enable the learner to acquire a proper foundation to skills relating to the 'reading of balance sheets' and thus enable the learner to take appropriate financial decisions.

3. Basics of Double Entry System

- 3.1. Every transaction affects two accounts. One account will be debited and the other account will be credited. The left hand side of the account is debit and the right hand side of the account is credit.

4. Classification

4.1. There are 3 kinds of accounts: (i) Personal Account, (ii) Asset Account and (iii) Nominal Account. A description of each of these is given below.

1. Personal Account: Personal Account concerns dealings with persons or firms. Separate Accounts are maintained for each person/firm. The principles for Debiting and crediting of personal accounts are:

- ? Debit when personal account receives the benefit
- and
- ? Credit when personal account imparts benefit

Example 1:
Personal Account:

Mr. 'X' sold goods worth Rs.600 to Mr. 'Y' on credit basis.

This means that Mr. Y did not pay cash immediately. In other words, for the moment i.e., on the same day, no cash transactions have taken place. It may therefore be noted that in case of credit transactions, personal accounts are opened to indicate 'to be paid' or 'to be received'.

In the books of Mr. 'X' the personal account of 'Y' has to be debited. Since Y received the benefit, it must show that 'Y' is yet to pay 'X'.

In the books of Mr. 'Y', the personal account of Mr. 'X' has to be credited. Since X has imparted the benefit, it must show that 'Y' owes money to 'X'.

2. Asset Account: Asset Account is an all encompassing account covering cash, goods, cash at bank, furniture, machines, buildings, plants, lands, vehicles, semi- finished goods, raw material, etc. The principles of 'asset account' are:

- ? Debit what comes in
- and
- ? Credit what goes out

In the example given in the box above, the goods account is also affected by the transaction. The goods account is an asset account.

Now, keeping in view the principle of *debit what comes in*, the books of Mr. 'Y' will debit the 'goods account' since goods have come into Mr. Y's possession.

Similarly, keeping in view the principle of *credit what goes out*, the books of Mr. X will credit the goods account since goods have gone out from Mr. X's possession.

3 Nominal Account: The nominal account is based on the following principles, namely:

? Debit all expenses or losses

? Credit all gains or income

Rent, salaries, wages, Printing, Stationery, discount, coolie charges, discount, travelling expenses, commission etc., are some of the nominal accounts.

Example 2:

Nominal Account

Mr. 'X' paid rent of Rs.200 to Mr. 'Y' in cash.

In the books of Mr. 'X' debit the rent account and credit the cash account
and

In the books of Mr. 'Y' debit the cash Account and credit the rent account

Note: - In case of fully paid cash transactions personal accounts will not be affected. If cash is due and not paid, then personal accounts will be affected.

In this example, 'rent account' is a nominal account and the 'cash account' is an asset account.

5. Accounts Book

5.1. The following are the important accounts books that shall be maintained

- (1) Cash Book
- (2) Purchase Book
- (3) Purchase returns Book
- (4) Sales Book
- (5) Sales returns book
- (6) Bills Receivable Book
- (7) Bills Payable Book
- (8) Journal Proper

5.1.1. Cash Book: There are many types of cash books, but our focus will be on cash book with 'Cash, Bank and discount columns' on both sides. Both sides mean one on 'debit side' and the other on 'credit side'.

5.1.2. It must be ensured that the postings in cash book are made correctly before the cash book is signed daily. Following are the important points to be seen.

? The receipts will be entered on the debit side

- ? The payments will be entered on the credit side
- ? The cash book will have discount column on both debit side as well as on credit side.
 - o The discount is a nominal account. If discount is allowed when receiving cash payment, it will be indicated as a loss. Cash Account is an asset account and will appear on the debit side of the cash book. The discount is a loss and being a nominal account it will be debited.
 - o The opposite will be the transactions and postings if discount is received at the time of making cash payment

Note: It is always better to avoid the cash transactions either in receipts or payments. As far as possible all the transactions must undertaken through banks to prevent fraud.

For small payments, it is advisable to maintain a **Petty Cash Book** instead of burdening the main cash book.

5.1.3. Bank Column in Cash Book

- ? When payment is made by cheque, make entry on the credit side of the bank column in the cash book.
- ? When cash paid to the Bank, cash Account shall be entered on credit side and debited to the bank column.
- ? When cash is received, make entry only on the debit side of cash column.
- ? Each side of the cash book will have Ledger Folio Column Whenever, the bank column and cash column are affected simultaneously, mark it as 'C' in L.F. Column. 'C' means 'contra entry' without necessitating further ledger postings.

Points to note:

- ? When cash is drawn from Bank for office use, debit cash account and credit bank account. Mark 'C' on both sides of the L.F. Column.
- ? Strike balance with reference to cash columns. The cash column always shows the debit balance.
- ? Debit balance means cash receipts are more than cash payments. Post the debit balance of cash to the credit side of cash column and balance it. (Similarly do it for Bank Column separately)

- 5.1.4. Purchases Book: The goods purchased on credit basis for resale will be entered in the purchases book. Proper filing of invoices in consecutive order is sufficient instead of maintaining purchases book.
- 5.1.5. Purchases returns book: Some times goods bought need to be returned. A debit note will be issued while returning goods. Simultaneously entries will be made in the purchases return book.
- 5.1.6. Sales Book: Credit sales are recorded in the Sales Book i.e., goods sold on credit basis. For each credit sale 'outward, invoice' shall be prepared'
- 5.1.7. Sales returns book: When goods sold are returned, entries will be made in this book. Credit notes shall be issued on receipt of goods (returned back)
- 5.1.8. Bills receivable book: A bill receivable means that a trader is entitled to receive cash/cheque on a specific date. The final acceptor of the bill is liable to pay. In this book the details like, name of the drawer and acceptor, as well as the date of acceptance, the amount due and the due date of payment will be recorded.
- 5.1.9. Bills payable book: The bill accepted by the trader shall be paid by him on the due date. The details of bills payable will be recorded in this book.
- 5.1.10. Journal proper: If any transaction does not find place in the above said books i.e., from cash book to bills payable book, the journal proper book will be used. This Journal Proper Book is used for the following purposes :-
1. To pass opening entries
 2. Transfer from one account to another account
 3. To rectify errors.
 4. To pass adjusting entries
 5. To make closing entries
 6. Postings with reference to dishonor of bills.

6. Balancing

- 6.1. Till now, we have studied about all the Accounts Books to be maintained, namely cash book, purchases book, purchases return book, sales book, sales returns book, Bills receivable book, Bills payable book and journal proper. All these books are called Books of Original Entry. From these books Ledger Accounts will be opened. The Ledger Accounts will have two sides; the debit side and the credit side. If the debit is more than the credit side, it will be called as debit balance. If the credit side is more than the debit side, it will be called as credit balances.
- 6.2. The debit balance will be posted on the credit side to balance the accounts and the credit balance will be posted on the debit side to balance the accounts. This balancing will normally be done at the month end and also at the end of the Accounting Year.
- 6.3. The debit balance of Personal Account shows 'outstanding asset'. The credit balance of Personal Account, shows 'outstanding liability'.
- 6.4. The credit balance of Nominal Accounts shows gain. The debit balance of Nominal Account shows loss or expenses

7. Capital Account

- 7.1. The amount brought in to the business by a trader will be credited to Capital Account

8. Drawings Account

- 8.1. Amount drawn for personal use from business will be debited to drawings account.
- 8.2. At the time of balancing, the debit balance of drawings account will be debited to the capital account to reduce the capital account to the extent of drawings.
- 8.3. Every trader must maintain separate accounts for each personal account i.e., for each persons, each organization i.e., name-wise etc.

9. Trial Balance (by debit and credit balances method)

- 9.1. For every debit entry there will be a corresponding credit entry. Taking all the ledger accounts into consideration, the total of debit balances must be equal to the total of credit balances. Only for clerical errors it may not tally. Otherwise it must tally.
- 9.2. At the end of the accounting year all the ledger accounts will be balanced. If it is a debit balance it will taken to debit column of trial balance. If it is a credit balance, it will be taken to the credit column of trial balance.
- 9.3. Before preparing final accounts, preparation of trial balance statement is a must.
- 9.4. The columns of the Trial balance are :-
- ? Particulars
 - ? Ledger folio
 - ? Debit-column
 - ? Credit Column
 - ? Total of debit and credit columns

10. Trading Account:

- 10.1. The Trading Account shows the gross profit. Gross profit means :
- [A] Proceeds of the sale of goods
(Minus)
[B] Cost of the goods
- 10.2. The cost of the goods does not include establishment expenses.
- 10.3. Here the cost of the goods means expenses directly related to cost of the goods sold. This point must be made clear in the accounting policy of Board/ organisation/ business firm. In other the organisation/board/ business firm must clarify which items are to be included in the cost of the goods sold. Similarly, items that are not being included in the cost of the goods sold should also be indicated.
- 10.4. The following are to be considered on the debit side of the Trading Account:
- a) Opening stock (at the beginning of the Accounting Year)
 - b) Purchase of goods i.e., goods purchase in a given Accounting year minus goods returned (also known as Returns Outwards)

- c) Charges directly related to the cost of the goods purchased. For example: Freight, Duty, Clearing Charges, Dock Dues, and Carriage. Inwards, Cartage etc.,

10.5. The following are to be considered on the credit side of the Trading Account:

- a) Sale of goods minus goods returned.
- b) Closing stock

10.6. The credit balance on the Trading Account i.e., excess of credit over debit shows gross profit. This gross profit will be shown on the debit side of the Trading Account to balance the account. The gross profit will be carried forward to credit side of the Profit and Loss Account.

11. Activities to be carried out at the end of the Accounting Year

- Valuation of Closing Stock
- Valuation of work-in-progress
- List of bad-debts for approval of the Board to write-off
- If there is any indefiniteness regarding recovery of debts, give specific reasons and classify it as doubtful debts and make provision for it
- Write off the depreciation on various assets
- Account of outstanding liabilities
- Apportion payments made in advance
- Account income accrued and not received
- Adjustment or apportionment of income received in advance
- Make provision for discounts to be allowed to debtors.
- Make provision for discounts to be received from the creditors
- Calculate interest and account for the same on capital and drawings.

12. Stock Valuations :

- 12.1. The unsold goods should be valued on the basis of cost price or market price whichever is lower keeping the board policy in mind.

13. Accounting

→ Closing Stock

- ? Debit the stock account and credit the Trading Account
- ? Debit balance appear as asset in the Balance Sheet

→ Bad Debts

- ? Debit bad debts Account and
- ? Credit the accounts of Debtors
- ? Bad debts Account will appear on the debit side of profit and loss account

→ Doubtful Debts

- ? Debit Profit and Loss Account and
- ? Credit reserve for Doubtful debts Accounts
- ? Deduct out of Sundry Debtors and show it in the Balance Sheet

→ Depreciation

- ? Debit the depreciation account and
- ? Credit the concerned Asset Account
- ? debit Profit and Loss Account by depreciation Account
- ? In balance sheet show it as asset minus depreciation

14. Profit and Loss Account

- 14.1. As already explained the gross profit shown in Trading Account should bring on the credit side of Profit and Loss Account. All types of income received will appear on credit side of Profit and Loss Account. All expenses to carryout business like rent, salary, insurance, printing, advertisement etc., will appear on the debit side of the Profit and Loss Account. In other words, on the debit side of the account, the items of expenses coming under the following categories will be recorded.

- ? Selling and Distribution expenses
- ? Management Expenses

- ? Financial Expenses
- ? Maintenance and depreciation

14.2. The credit balance of Profit and Loss Account shows the net profit. The debit balance on the Profit and Loss Account shows the net loss.

15. Balance Sheet

15.1. The Balance Sheet shows the following:

- ? How net profit influenced capital
- ? What is the capital made up of.

15.2. The Balance Sheet is a statement of financial position for the prescribed accounting period in terms of Assets and Liabilities. The right hand side shows the Asset side and left hand side shows the Liabilities side.

15.3. The assets and liabilities will be given value in terms of money.

- The assets will show how money was used.
- The liabilities will show where the money had come from.

ASSETS	=	Liabilities to creditors and shareholders
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15.4. The Balance Sheet to be supported by Profit and Loss Account sources and uses of funds statement, notes to the financial statements and the auditor certificate.

15.5. What the business owns are assets and what it owes are liabilities. The assets are of two groups, namely:

- o Fixed Assets
- o Current Assets

Fixed Assets: - Are meant for long term use

Current Assets :- Are ready to be converted into cash during the operating cycle of the business e.g., accounts receivable, inventories, marketable securities. Cash is a first current asset. The period between buying the raw materials and selling the finished products is the operating cycle, which will be less than one year.

16. Liquidity

- 16.1. Liquidity, measured in degree depends on how quickly an asset can be converted into cash. Therefore current assets are more liquid than fixed assets.

17. Quick Asset

- 17.1. Quick Assets are part of current assets. it can quickly be converted into cash.

18. Outstanding assets

- 18.1. This refers to amounts yet to be paid by the customers. These customers are referred to as debtors or accounts receivable. This will appear on the asset side of the balance sheet.
- 18.2. Long term assets like land, buildings, plant and machinery, motor vehicles, fixtures and fittings are the fixed assets. There will not be much variation or fluctuation in value as far as fixed assets are concerned.
- 18.3. On the other side current assets will vary much even on day-to-day basis. All the inventories like stocks of finished products, raw materials and work-in-progress are all current assets.
- 18.4. Normally fixed assets will not sell to raise cash, because they are meant for long term use. The liquidity of the fixed assets is very low.

19. Valuation

- 19.1. The value of assets should be estimated before it is incorporated in the balance sheet. This should be done within the framework of the Accounting Policy of the Board/ Organisation/ Business firm. The normal rule is that current assets are valued at cost price or market price, whichever is less. Fixed assets are valued at cost price less depreciation and shown on the Assets side of the Balance Sheet.
- 19.2. In the absence of a definite policy, some companies may overvalue their assets to mislead the various stake holders, like share holders and debenture holders.
- 19.3. The value of marketable securities is computed with reference to their market value and indicated in the assets side of the Balance Sheet.
- 19.4. While making a valuation of inventories, spoiled stocks or obsolete stocks should be deleted.

- 19.5. Valuation of goodwill is difficult. Goodwill will depend on reputation. It is intangible. It will be incorporated in the Balance Sheet only when it is raised in the books of accounts, for example, at the time of purchasing a going concern.

20. Liabilities

- 20.1. The three main groups of liabilities are :

- ? Current liabilities
- ? Fixed liabilities
- ? Share holders funds

(Shareholders are different from person who has given loans to the company. People who have given loans are not the owners of the company. Shareholders are the owners of the company.)

- Long term loans from financial institutions are an example of fixed liability.
- Short term loans and overdraft accounts payable are examples of current liabilities.
- The cost of current liabilities will be low when compared to the cost of fixed liabilities.
- Current liabilities and fixed liabilities are called outside liabilities.
- Normally, the current liabilities have to be met within one year.
- Fixed liabilities represent the long-term finance and the current liabilities represent short-term finance.

- 20.2. Usually, long term loans are obtained on the basis of property as security. The property offered as security may be in the form of building, plant and machinery etc.

21. Share holders Funds.

- 21.1. To a company the major portion of money comes from the shareholders. This will be shown in the Balance Sheet as 'Capital issued and subscribed'. It must be within the limits of "Capital Authorized" by law.
- 21.2. The company will pay dividends to its share holders. The dividends will be paid out of profits.
- 21.3. The portion of the profits retained in the business without payment to the shareholders may form 'Capital reserve and revenue reserve'.
- 21.4. Revenue Reserve emanates from profit from normal business operations. Capital reserve comes from the amount realized from the sale of fixed assets. The sale of fixed assets is not part of normal business operations.

- 21.5. Only profit in the form of dividend will be paid to share holders. The original amount subscribed by the share holders will not be paid up until the company is closes down. Therefore, the funds of the share holders are a permanent finance of a company. This is shown as liability in the Balance Sheet, as this amount is owed by the company to its shareholders. The company will not pay interest on the funds of the share holders, but compensates them in the form of dividends.
- 21.6. There may be different classes of shares. But we are concentrating on ordinary shares and preference shares.
- 21.7. If the company is to wound up, the ordinary share holders will get their claim settled only after all the creditors and other investors get their claims settled. Preferential share holders will have priority over their ordinary shareholders. This is because the ordinary share holders are the real owners of the company.

22. Capital Reserve

- 22.1. Sometimes the revaluation of fixed assets shows increased value. This is called capital revenue. They may be in form of cumulative totals (accumulated from year to year) upto the end of the period in the balance sheet.
- 22.2. A company must obtain legal clearance to issue shares up to certain amount. This is called “capital authorized”. A company can issue shares up to the amount of ‘capital authorized’. Normally, a company floats shares much below the amount of ‘capital authorized’. Out of shares floated by the company, the amount actually contributed by the shareholders is called the “capital issued and subscribed”.

Points to note:

Only in case a company is to be wound up, does the question of liability to return shareholders funds arise. The dividends to share holders will not be paid from capital reserve, but may be paid out from revenue reserve.

Apart form paying dividends to share holders, out of net profit, a company will try to retain some portion of the profit arising from its normal operations. This is called Revenue Reserve. This revenue reserve may be used for (a) future expansion plans or (b) to pay dividend for those years, when there is less or no profit or to simply maintain consistency in payment of dividends and thereby maintain credibility in the minds of the shareholders.

23. Solvency

- 23.1. If assets are more than that of 'out side liabilities', a company is said to be solvent.

24. Liquidity

- 24.1. If a company can meet its current liabilities out of current assets, it is called as 'liquid'.

25. Working capital

- 25.1. Working Capital is calculated as:

$$CA - CL = W.C.$$

Where CA stands for current Assets, CL stands for current liabilities and WC stands for Working Capital.

26. Gearing

- 26.1. Gearing refers to the SHF: BM (LC) where SHF refers to the shareholders' funds and BM refer to the borrowed money or loan capital.

Example 3

Gearing

If gearing is 4:1 it means that proportionality is 4/5 and 1/5 i.e., 4/5 is SHF and 1/5 is BM. Therefore SHF = 80% and BM = 20%. This is a situation of low gearing that is 4:1, showing less loan capital and also indicating that there is scope to borrow more money.

The opposite 1:4 is a case of high gearing.

27. Comparison

- 27.1. The balance sheet gives two sets of figures, to compare the current balance sheet with that of previous balance sheet.
- 27.2. Comparison will serve the purpose of ascertaining the cause for changes. Such comparison will also help ascertain the sources and uses of funds.
- 27.3. The net working capital is nothing but excess of current assets over current liabilities. In other words, the net working capital shows liquidity.

28. Sources and uses of funds

- 28.1. By comparing the current balance sheet with the previous balance sheet, the statement of sources and uses of funds can be prepared.
- 28.2. Sources means, where does the money come from. Uses means, how such new money has been used.
- 28.3. The new funds or money may be due to the
- (i) Net profit i.e., after the depreciation
 - (ii) Depreciation; (Note: - because of depreciation money will not actually Leave the business)
 - (iii) New shares subscribed
 - (iv) Fixed assets sold
 - (v) Fresh loans availed.
- 28.4. The funds might have been used :
- (i) To pay dividends
 - (ii) Procurement of new fixed assets
 - (iii) Loan re-payment
 - (iv) To raise net working capital for more liquidity.
- 28.5. Sources of funds must always be equal to uses: to the extent that it is not used, there will be an increase in the liquidity. There will be an increase in the net working capital or increase in the gap between the current assets and current liabilities.
- 28.6. The sources and uses of money statement should be attached to the balance sheet. The mere rise in company's money may not be indicative of the health status of the company. The health of the company depends on how the money is used. If it is used for productive operations or for the expansion of existing plants or for purchase of new machinery or for modernization, future production may increase. If the new money is spent, for example, for the construction or for the renovation of the houses of directors, it may not improve production. Therefore, to read the financial health of a company, one has to analyze how and for what purpose has the money been spent.

29. Solvency ratio

- 29.1. The portion of the shareholder funds (SHF) out of the total liabilities determines the solvency of a company. The higher the SHF when compared to other liabilities in total, the greater the solvency and the vice-versa.
- 29.2. The share holders' funds are also known as 'owner's equity'.
- 29.3. High solvency ratio means that the SHF portion in the total liabilities is high representing capacity to borrow more money from outside. Low solvency ratio means that SHF portion in the total liabilities is low and indicates that there is less scope to borrow money from outside. The solvency ratio is often expressed as a percentage.
- 29.4. The two measures of liquidity are (a) Current ratio and (b) Quick ratio
- 29.5. Current Ratio is measured by the following formula:

$$CR = CA : CL$$

Where CR - Stands for current ratio

CA stands for current assets and

CL stands for current liabilities

- 29.6. Quick Ratio is measured by the following formula:

$$QR = QA : CL$$

Where QR stands for quick ratio

QA stands for quick assets and

CL stands for current liabilities

- 29.7. To measure general liquidity, current ratio is required. To measure immediate liquidity, quick ratio is required.
- 29.8. In business, the harsh reality is that cash is more important than profit. Therefore, there must be a situation of higher portion of current assets when compared to current liability, so that the current ratio will always be positive i.e., more than one. To calculate the current ratio, the marketable securities should always be included.

- 29.9. Quick assets are cash and include other assets which can quickly be converted into cash. Quick assets do not include stock or inventories.

How quickly can liabilities be met?

To obtain answers, we have to use current ratio and quick ratio.

It is always safer to have the current ratio on the positive side to maintain a higher degree of liquidity. This has to be specifically stated in an accounting policy. Based on an analysis using current and quick ratios, the management may think of financial re-planning.

30. Profit and Loss Account (Income Statement)

- 30.1. The balance sheet must be supplemented by the Profit and Loss Account. The Profit and Loss Account shows :

- ? Gross Profit
- ? Operating Profit
- ? Profit before tax (PBT)
- ? Net Profit after tax (NPAT)

Gross Profit (G.P.)

Cost of sales includes money spent on raw materials, wages and factory overhead costs.

Operating Profit (OP)

$OP = GP - \text{Selling administrative and general expenses}$

Selling administrative and general expenses includes office staff, stationery, telephone, sales force etc.,

Profit Before Tax (PBT)

$PBT = OP - \text{Non-operating expenses.}$

Non-operating expenses include interest payment on loans, losses on the sale of investments and fixed assets etc.

Net Profit after tax (NPAT)

$NPAT = PBT - \text{Income Tax}$

The Profitability is measured on (a) Return on capital employed, (b) Return on share holders funds (SHF) as indicated in the formulae given below:

Return on Capital Employed

$$= \frac{\text{PBT} + \text{Interest on fixed liabilities}}{\text{Capital employed}} \times 100$$

Return on SHF

$$= \frac{\text{NPAT}}{\text{SHF}} \times 100$$

Capital employed

Capital employed means

$$\boxed{\text{Total Assets}} - \boxed{\text{Current Liabilities}}$$

Capital employed is nothing but SHF + long term liabilities.

To read the balance sheet it is necessary to utilise the auditor's certificate and notes to the financial statements.

Limitations

The data available in a balance sheet will not be sufficient to value the company as a going concern. Because it is concerned only with things that can be expressed in monetary terms. The other limitation is that figures that appear in the balance sheet are only estimates and not scientific facts. The technical competency of staff, technological advancement, market conditions etc., will have its own effects on business environment. These aspects are not revealed in the balance sheet.

LEARNING UNIT - I

**BASICS OF COMMERCIAL
ACCOUNTING
AND BALANCE SHEET**

INSTRUCTIONS TO FACULTY

**Administrative Training Institute
Lalitha Mahal Road, Mysore - 570 011**

Basics of Commercial Accounting and Balance Sheet

1. Objectives :

- 1.1. At the end of this Learning Unit the participants will be able to:
- o classify transactions on the debit and credit side
 - o understand important entries in the Subsidiary Registers
 - o Prepare Trial Balance
 - o Prepare Trading Account
 - o Prepare Profit and Loss Account
 - o Prepare Balance Sheet
 - o Read Balance Sheet with some crucial ratios

2. Sub Units of Learning

1. Objectives and advantages of double entry
2. Specimen transactions indicating classification of debit or credit
3. Importance of Subsidiary Registers
4. Trial balance
5. Trading Account
6. Profit and Loss Account
7. Preparation of Balance Sheet and Skills to read a Balance Sheet

3. Methodology

- 3.1 Faculty shall start Presentation by ‘**Story telling**’ with reference to a businessmen’s financial transitions Vis-à-vis accounting procedures.
- 3.2 The methodology followed will provide for a mix of presentations by faculty, which will raise issues and/ or provide specific exercises for discussion among the participants in small groups. Group discussion will be followed by plenary presentation by the participants. After the plenary presentations, faculty will intervene for listing out the crucial learning points from the session/ discussion, which will then be summed by the faculty. On an average, the initial presentation cum discussion will take approximately one hour. The group discussion/ activity/ exercise will take approximately two hours, which will be followed by group presentations, plenary discussions and summing up.

- 3.3 The details of group activity with detailed instructions are explained in the handout on Group Activities for Learning Unit 1.
- 3.4 To ensure the transferability of learning the ratio between knowledge and skill is determined at 1:3 and the participants will list important learning points at the end of the presentation of group activity.

4. Reading Material:

- 4.1 Reading materials along with the tasks and exercises to be completed by the participants will be supplied.
- 4.2 Participants may also use Library books and journals.
- 4.3 This design contains details regarding:
 - a) How faculty should conduct learning activities and
 - b) The details of group activities

5. Instructions to Faculty

- 5.1. The basic responsibility of the faculty is to create learning environment which facilitate the learner to learn. Most participants are expected to be Non-Commerce graduates, and hence it is crucial that an environment be created to enable them to grasp the basics of Accounting and Balance Sheets.
- 5.2. It is neither intended nor possible from a course of this nature that the participants are made experts in financial management. The objective of this learning unit as well as the other learning units is to enable the participants to acquire some minimum skills to read the financial pages and to enable them to analyze the key issues recorded in the financial records, to take financial decisions on their own.
- 5.3. Therefore in this learning unit the Faculty should start on an inspiring note clearly explaining the objectives.
- 5.4. The estimated time for this learning unit is 6 hours.
- 5.5. The first two hours i.e., before the commencement of this learning unit the faculty :
 - ? Will introduce him/her.
 - ? Initiate an icebreaking and introductory activities for all the participants to get to know each, and create an environment that is cheerful, friendly, non-formal and non-hierarchical.

- ? elicit expectations from the participants and make an analysis of the expectations with reference to the course design.
 - ? explain the objectives of the course, highlighting the methodology proposed to be used.
6. The Faculty may use the following visual aid to explain the course contents:

Visual Aid -1: Course Contents - Phase 1 & 2

Course Contents - Phase 1 & 2
<ul style="list-style-type: none">• Accounting Policy• Basics of Commercial Accounting and reading of Balance Sheet• Discounted Cash Flow Technique and Internal Rate of Return• Management of Capital• Measurement of Risk• Capital Asset Pricing Model• Derivatives related to investments• Structure of Capital• Analysis of Financial Pages• Performance budgeting• Zero-base Budgeting• Cost-benefit analysis• Portfolio theory• International Finance

- 6.1. After giving a brief overview of the course contents, faculty may break participants into four groups. It is necessary to ensure that every group has members of equal potential and experience. Faculty may ensure that participants with commerce backgrounds or experience in the corporate management are equally distributed in all the groups, rather than being clustered in one group only.
- 6.2. With this faculty may provide participants with any other details about the training institution, available facilities, including library, computer centre, recreation facilities etc.

7. Now Commence with the presentation on L.U-I

- 7.1. Make a presentation on the Basics of Commercial Accounting, ensuring that all points listed in Visual Aid-2 are covered. It is necessary to obtain immediate feedback on each point covered in the presentation, in order to assess the participant's level of understanding.

Visual Aid - 2: Basics of Commercial Accounting

Basics of Commercial Accounting

- Classifications
- Subsidiary registers
- Trial Balance
- Trading Account
- Profit and Loss Account
- Balance Sheet

Visual Aid - 3: Classification

Classification

- Personal Account
- Asset Account
- Nominal Account

- 7.2. While explaining classifications, faculty must ensure that they explain (a) each account with at least two examples, (b) the meaning of debit and credit, (c) ledger rulings.

Visual Aid – 4: Subsidiary Records

Subsidiary Records

- Cash Book
- Purchases Book
- Return outwards Book
- Sales Book
- Return inwards Book
- Bills Receivable Book
- Bills payable Book
- Journal Proper

- 7.3. The overall objective of Subsidiary Records is to maintain accuracy in accounts and prevent fraud. While handling the portion on Subsidiary Records, Faculty should explain (a) the importance and objectives of each record, (b) Ledger Postings, (c) how to identify key entries in these registers and for what purpose.

Visual Aid -5: Trial Balance

Trial Balance	
• Balances method	
• Debit Balance	
• Credit Balance	
• Capital Account	
• Debtors	
• Creditors	
• Errors	

- 7.4. While explaining Trial Balance, faculty should explain (a) the meaning of balances on accounts, (b) why Trial Balances must be prepared, before finalizing Accounts. This should preferably be shown with a concrete example, which indicates why and how a Trial Balance always tallies. (c) Why certain accounts always show debit balances and other accounts always show credit balances.

Visual Aid 6 : Trading Account

Trading Account			
• Opening Stock	Rs.	• Sales	Rs.
• Purchases		Less: returns	
Less: returns		• Closing Stock	
• Freight duty etc.			
• Carriage Inwards			
• Gross Profit Transferred to P & L Account			
Total Rs.		Total Rs.	

- 7.5. Faculty to explain :-

- The meaning of trading expenses
- Stock Accounts
- Direct Charges

- Results of Trading Account

Visual Aid - 7: Profit and Loss Account

Profit and Loss Account			
<ul style="list-style-type: none"> • Selling and Distribution Expenses • Management Expenses • Financial Expenses • Maintenance and Depreciation • Net Profit 	Rs.	<ul style="list-style-type: none"> • Gross Profit • Earned Discount • Income From Investment • Interest on Deposits • Interest on renewal of bills • Other income 	Rs
Total Rs.		Total Rs.	

7.6. Faculty should explain each item on the debit side of Profit and loss Account with examples. Faculty may use the example given below:

- Selling and Distribution expenses
 - Ware house and Store Rent
 - Packing charges
 - Export charges
 - Cost of samples
 - Cost of catalogues
 - Advertising
 - Travelers' Salaries expenses and commission
 - Bad debts
 - upkeep of motor Lorries or Van
- Management expenses
 - Office salaries and wages
 - Office Rent and Taxes
 - Office Lighting and Insurance
 - Office Car up-keep
 - Printing and Stationery
 - Telephone charges
 - Postage, Telegram etc.,
 - Legal expenses
 - Directors' fees and expenses

- Managing Agents Remuneration and Commission
- Audit Fees
- Office General exposes
- Financial Expenses
 - Cash discounts allowed
 - Cost of discounting bills
 - Interest on Capital
 - Interest on borrowed Capital
 - Loss in exchange
 - Discount on Issue of Debentures
 - Preliminary expenses written off.
- Maintenance and Depreciation
 - Repairs and renewals
 - Depreciation of Assets

7.7. Faculty may also explain the balancing of Profit and Loss Account and its effect on the Balance Sheet.

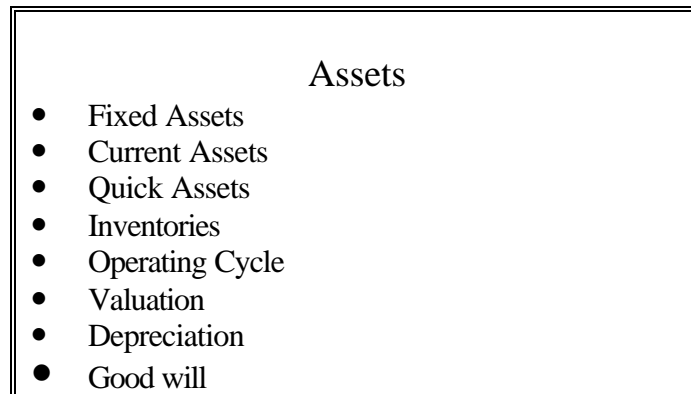
Visual Aid - 8 : Liabilities & Assets

Liabilities	Rs.	Assets	Rs.
<u>Sundry Creditors</u> <ul style="list-style-type: none"> ● Bills Payable ● Open Accounts ● Wages and Salaries 		Cash in hand Cash in Bank Bills Receivable Sundry Debtors Less: Reserve for Doubtful debts Less: Reserve for discounts Stock-in-Trade Fixed assets Minus: depreciation Land + extensions Pre-paid	
<u>Capital Accounts</u> <ul style="list-style-type: none"> ● Opening Balance ● Plus: Profit Minus: drawings 			
Total Rs.		Total Rs.	

7.8. While handling this subject, faculty may explain the :

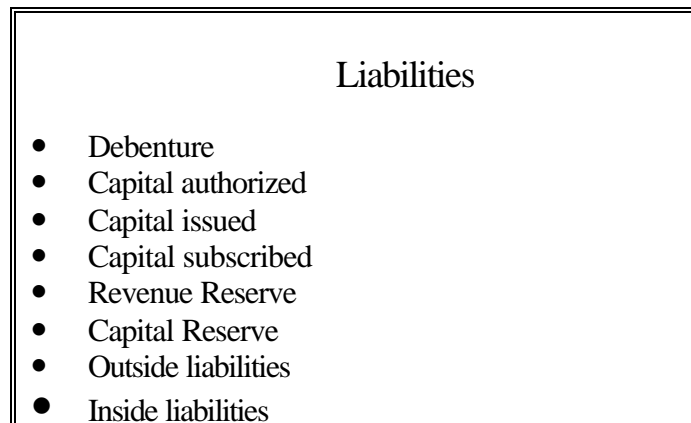
- Format of Balance Sheet
- Why Balance Sheet must always tally
- Estimations of Assets and Liabilities
- Provisions for bad and doubtful debts
- Depreciation of Capital Assets
- Capital Account

Visual Aid - 9: Assets



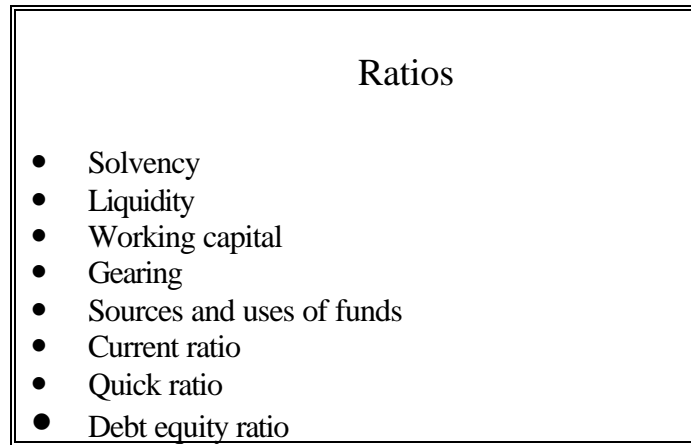
7.9. Faculty should explain the impact of variation of each item on other items. Also, explain the effect of variation of proportion inter-se. What is its impact or change? How is accounting policy important?

Visual Aid - 10: Liabilities



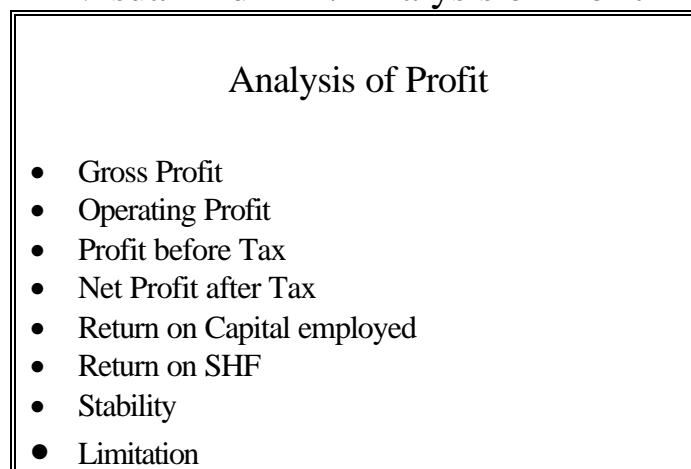
- 7.10. Faculty should explain the meaning of each item shown in this visual aid with simple examples.

Visual Aid - 11: Ratios



- 7.11. Faculty should explain how to use ratios with two or three examples for each ratio. Ensure that the participants are understanding implications of the outcome.
- 7.12. Also explain that there are different stake holders to Balance sheet, and that ratios can be used and analysed from the viewpoints of different stake holders. *Highlight how the out come of the ratio analysis can be used?*
- 7.13. Ask the participants to make their own ratio analysis during the group activity.

Visual Aid - 12: Analysis of Profit



7.14 Faculty should explain (a) the importance of profit analysis with reference to return on capital employed and return on shareholders funds with two or three examples, (b) highlight what a balance sheet does not reveal, (c) importance of stability and how does the Balance Sheet reveal the stability of a Company.

8. Group Work:

- 8.1. After the preliminary presentation on the Basics of Commercial Accounting and Balance Sheets, distribute Reading Material and Work Sheet for group activity. Ask participants to read the material circulated and thereafter to discuss the questions/ issues in the Work Sheet for possible answers/ solutions.
- 8.2. Faculty should act as facilitator for each group to enable the participants to solve the problems in the group. The Faculty shall monitor the group activities as shown in the Handout on Group Activities for Learning Unit 2.
- 8.3. Finally, Faculty should respond to the presentations made by the each group and facilitate the culling out of learning points by the participants.

LEARNING UNIT - II

“Discounted Cash Flow Technique and Internal Rate of Return”

[Group Activities]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Learning Unit – 2

Group Activity

Discounted cash flow Technique and Internal Rate of Return

1. This exercise will also be conducted in 4 groups. The first two groups will be entrusted with the task of applying Discounted Cash Flow Technique. The next two groups will calculate the Internal Rate of Return.
 - 1.1. Each group will be given sufficient time to discuss and to solve the problems entrusted to them and to prepare visual aids.
 - 1.2. Each group will make a presentation using visual aids. Each group may be given approximately 25 minutes for the presentation and Faculty may require 5-10 minutes for moderation and summing up.
 - 1.3. At the end of each presentation all groups will list out the key learning points, which will be consolidated in the plenary.

2. The Tasks: DCFT Groups I and II.

Application of DCFT for purchase decisions.

(The following problems taken from the book 'Expenditure Control and Zero base budgeting' by Prof. K.L. Handa)

The purchase choice relates to two machines, i.e., Machine A and Machine B

The details of Machine A are as follows:

➤ Initial cost of 'A'	Rs.3.5 Lakhs
➤ O & M expenses	
• First year	Rs.0.30 Lakhs
• Second year	Rs.0.30 Lakhs
• Third year	Rs.0.40 Lakhs
• Fourth year	Rs.0.50 Lakhs
• Fifth year	Rs.0.55 Lakhs

The life span of Machine A is 5 years. The salvage value of Machine 'A' at the end of the 5th year is Rs.50,000-00

The estimated returns Machine A are as follows.

First year	Rs.0.50 Lakhs
Second year	Rs.0.50 Lakhs
Third year	Rs.0.60 Lakhs
Forth year	Rs.0.60 Lakhs
Fifth year	Rs.0.50 Lakhs

The details of Machine 'B' are as follows:

- Initial cost of Machine 'B' Rs.5.00 Lakhs
- O & M expenses
 - First year Rs.0.20 Lakhs
 - Second year Rs.0.20 Lakhs
 - Third year Rs.0.30 Lakhs
 - Forth year Rs.0.35 Lakhs
 - Fifth year Rs.0.40 Lakhs
 - Sixth Year Rs.0.45 Lakhs

The life span of Machine 'B' is 6 years. The salvage value at the end of the 6th year is Rs.0.80 Lakhs.

The estimated returns on machine 'B' are as follows.

I Year	0.70 Lakhs
II Year	0.70 Lakhs
III Year	0.65 Lakhs
IV Year	0.60 Lakhs
V Year	0.55 Lakhs
VI Year	0.50 Lakhs.

Apply DCFT for a purchase decision.

3. The Tasks: IRR Groups III and IV

Calculation of IRR to assess the viability of the project.

A farmer intends to make investment of Rs.20, 000 in a project involving Construction of a small shed, purchase of tools and equipments, and installation of oil ghani (crushing machine) with 2 HP (4 bull expeller) motor, including fitting charges. The oil ghani has a life of 10 years, at the end of which its salvage value will be Rs.1,000. His opportunity cost is 18%. For each year, the farmer's estimated earnings and costs associated with the project will be as follows :

Year	Earning	Cost	Net Cash Flow
1.	Rs.6000	Rs.2000	Rs.4000
2.	Rs.7000	Rs.2000	Rs.5000
3.	Rs.8000	Rs.2000	Rs.6000
4.	Rs.8500	Rs.2500	Rs.6000
5.	Rs.8500	Rs.2500	Rs.6000
6.	Rs.8500	Rs.2500	Rs.6000
7.	Rs.9000	Rs.3000	Rs.6000
8.	Rs.8000	Rs.3000	Rs.5000
9.	Rs.7000	Rs.3000	Rs.4000
10.	Rs.7000	Rs.3000	Rs.5000*

*includes Rs.1000 as salvage value of the project.

His earnings include income from grinding 15 to 20 quintals of oil seeds of Sarson (mustard) by charging a specified rate, revenue from sale of oil, etc. His costs in operating the oil ghani include expenditure on raw material, labour, overheads etc. His earnings from the project are termed as cash in-flows, and his costs are called cash out-flows. The difference between the cash in-flow and the cash out-flow is termed Net Cash Flow. The net cash flow for the 10th year (last year of the life of the project) has been calculated as Rs.5000 which includes Rs.1000 as salvage value of the project left at the end of its life.

Now, calculate Internal Rate of Return to find out the viability of the project.

LEARNING UNIT - II

“Discounted Cash Flow Technique and Internal Rate of Return”

[Reading Material]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Learning Unit 2

Reading Material

Discounted Cash Flow Technique

1. The objective of the application of DCFT is to enable the investor to take economical decisions i.e., decision with the least investment for the highest returns.
 - 1.1. DCFT is based upon the concept of time value of money. In other words, money in hand today is more valuable than the same amount of money after some time, because of the existence of cost of money in terms of interest.
 - 1.2. DCFT technique is useful in the following areas of investment decisions.
 - Buying or hiring.
 - Expanding the existing plant/ business/ or to going in for a new plant/ business.
 - Whether to make full cash down payment or to make payments in installments.
 - Whether to opt for machinery operated work or labour oriented work
 - Determine lead time in inventory management.
 - Project investments and return on such investments.
 - 1.3. To apply DCFT, a common point of time should be determined, especially in project finance. For example, cash out flow estimation may be made on different dates six times during a calendar year. Similarly returns may be obtained on different dates in the same year. All such estimated cash out flows and cash in flows at different points of time in the year, must be brought in line with a common time unit for the application of DCFT. The common unit of time say, one year or 6 months or 3 months must be determined by the Project Board for uniformity and consistency in calculation. Application of DCFT can also help in comparing one project estimation with other projects, in order to facilitate the investor in the selection of a project for implementation. DCFT can be used to select the most economical method for application.
 - 1.4 In project finance, DCFT is the most scientific technique to measure benefits and costs associated with project.
 - 1.5 DCFT will help assess the present value of returns and cost. This is based on the reverse of Compound Interest formula. The compound interest formula is $FV = PV \times (1 + r)^n$

Where FV stands for Future Value,
PV stands for Present Value,

r stands for interest rate,
n stands for number of years.

In other words, Compound Interest formula will help us to find Future Value of money.

For example:

At the rate of 10% PA, the Future Value of Rs.100 at the end of the

I Year	=	Rs.110
II Year	=	Rs.121
III Year	=	Rs.133.10
IV Year	=	Rs.146.40 and so on.

By reversing the compounding interest formula, we can find the present value of money receivable in future i.e. '

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

- 1.6. For example, if 'X' invests Rs.100 on 01.01.2001 at rate of 10% P.A. and he expects a return of Rs.146.40 at the end of the IV year. In terms of the cost of the money i.e., interest rate of 10 % P.A., the present value of Rs.146.40 receivable at the end of the fourth year is Rs.100 only. [It may be less than Rs.100, if the negative aspect of inflation effect is calculated. But we are not focusing on inflation accounting]
- 1.7. Every investor will expect returns higher than the Investment + Cost of Investment. The cost of investment is nothing but interest rate. Some investors expect returns higher than the present returns, i.e. more than the present opportunity. This is called opportunity cost based approach to calculate net returns. Opportunity cost will be the cost of capital to measure the cost of cash outflow and cash inflow. Therefore, the cost of capital to calculate the net return varies from person to person, firm to firm and industry to industry. The Planning Commission of Government of India fixes the cost of capital at 12% to calculate the net returns for all government projects, barring some Agro-based industries, like sugar Factories, where the deficiency in returns is subsidized because of social weightages.
- 1.8. The cost of capital i.e., in the form of interest rate or in the form of opportunity cost is taken as Discount Factor to calculate the present value of costs and the present value of returns. The difference is the net present value:
- 1.9. To save time, there are ready made: SPPWF table and USPWF Table.

- 1.10. SPPWF stands for the Single Payment Present worth Factor and USPWF stands for the Uniform Series of Present Worth Factors. The tables are enclosed to these reading materials.

SPPWF Table

- 1.11. The SPPWF table is prepared on the present value of Re.1.
- 1.12. The first vertical column shows years up to 50 years.
- 1.13. The first horizontal column shows discount factors upto 50 %
- 1.14. Overall, the SPPWF table shows the returns on a single rupee receivable in future at the end of different years (upto 50 Years) and at the different discount factors. Therefore, there is no need to use the formula to find out the present value of a single rupee for each year and for each discount factor.
- 1.15. For example, to calculate the present value of Rs.10, 000 at the end of the 9th year at the discount factor of 15%, we can use the SPPWF table, without having to use the formula.

“Go to 9th year in the first vertical column, go to 15 % Discount Factor on the first horizontal column. Both straight lines will meet at 0.2843. To get the PV of Rs.10, 000,

$$\begin{aligned} &= \text{Rs.}10,000 \times 0.2843 \\ &= \text{Rs.}2,843. \end{aligned}$$

This means, that the Present Value of Rs.10, 000 receivable in future i.e., at the end of the 9th year is Rs.2, 843.

- 1.16. Where the investment amount or the return amount or both investment and return amounts varies from time to time (i.e., not being constant from year to year) the SPPWF table must be applied.

USPWF table

- 1.17. If the investment amount or return amount or both investment and return amounts are constant from year to year or for a group of years, the USPWF table must be used for speedy calculation.
- 1.18. For example, if the return of Rs.10,000 is constant per year, say for 10 years at the discount factor of 15% P.A., the use of the SPPWF table to calculate the PV will be a long and laborious process, as is obvious from the example below:

- 1.19. If we use SPPWF table from 1st to 10th year and 15 % Discount Factor, it will appear as:

I Year	0.8696
II Year	0.7561
III Year	0.6575
IV Year	0.5718
V Year	0.4972
VI Year	0.4323
VII Year	0.3759
VIII Year	0.3269
IX Year	0.2843
X Year	0.2472
	Rs.5.0188

- 1.20. In this example the return is Rs.10, 000 for each year: i.e. the return is constant for each year. By using SPPWF tables we undoubtedly arrived at the figure of Rs 5.0188. But it is a time consuming process.
- 1.21. Instead if we refer to the USPWF table and look at the 10th year of 15 % D.F. column, we will find the figure of Rs 5.0188. This is the same figure that we got by adding the figures from 1st to 10th year in the 15% of column of SPPWF table. But we saved considerable time required for calculation.
- 1.22. To calculate the PV of Rs.10, 000 at the end of each year over 10 years multiply.

$$\begin{aligned} &\text{Rs.10, 000} \times 5.0188 \\ &= \text{Rs.50, 188} \end{aligned}$$

In other words, the PV of Rs.1, 00,000 is Rs.50, 188.

- 1.23. Consider the following example, where the

- Cost of equipment A is Rs.19,00,000

- Cost of equipment B is Rs.18,00,000, and
- Cost of equipment C is Rs.17,00,000

- 1.24. All the equipment will serve a common purpose i.e., utility. The life span of each equipment is 5 years.
- 1.25. Based on initial costs only, the obvious decision would be in favour of purchasing equipment 'C' since it costs least. However, if we apply DCFT and consider information under indicators like Returns, Operation & Maintenance expenses and Salvage Value, the decision would clearly be different. Let us see, how this technique can be applied. Following are the technical estimations regarding Returns, Operation & Maintenance expenses and Salvage Value.

Equipment		A	B		C	
Initial Cost		Rs 19,00,000	Rs 18,00,000		Rs 17,00,000	
Year	O&M	Returns	O&M	Returns	O&M	Returns
I	10,000	800,000	12,000	800,000	14,000	700,000
2	11,000	800,000	13,000	700,000	14,000	700,000
3	12,000	700,000	14,000	600,000	14,000	600,000
4	12,500	600,000	14,500	500,000	14,000	500,000
5	13,000	500,000	15,000	400,000	14,000	300,000
Salvage value at the end of the 5 th year		200,000		100,000		50,000

- 1.26. Now calculate the present value at the Discount Factor of 20 %

Equipment A :

Present Value of estimated cash outflow is:

$$19,00,000 + (10,000 \times 0.8333) + (11,000 \times 0.6944) + (12,000 \times 0.5787) + (12,500 \times 0.4823) + (13,000 \times 0.4019) = \text{Rs.}19,34,169.$$

Present value of estimated cash inflow is:

$$(800,000 \times 0.8333) + (800,000 \times 0.6944) + (700,000 \times 0.5787) + (800,000 \times 0.4823) + (500,000 \times 0.4019) + (200,000 \times 0.4019) = \text{Rs.}21,97,960$$

Net present value is equal to benefits in terms of present value minus cost in terms of present value. That means that in this case: NPV = 2,63,791

Equipment B :

Present value of estimated cash outflow is:

$$18,00,000 + (12,000 \times 0.8333) + (13,000 \times 0.6944) + (14,000 \times 0.5787) \\ + (14,500 \times 0.4823) + (15,000 \times 0.4019) = \text{Rs.} 18,40,150$$

The present value of estimated cash inflow is:

$$(8,00,000 \times 0.8333) + (7,00,000 \times 0.6944) + (6,00,000 \times 0.5787) + (5,00,000 \times 0.4823) \\ + (4,00,000 \times 0.4019) + (1,00,000 \times 0.4019) = \text{Rs.} 19,42,040$$

The NPV in the present case is = 1,01,890

Equipment C :

The PV of estimated cash outflow is:

$$17,00,000 + (14,000 \times 2.9906) = \text{Rs.} 17,41,868$$

The PV of cash inflow is:

$$(7,00,000 \times 0.8333) + (7,00,000 \times 0.6944) + (6,00,000 \times 0.5787) + (6,00,000 \times 0.4823) \\ + (3,00,000 \times 0.4019) + (50,000 \times 0.4019) = \text{Rs.} 18,46,655$$

The NPV in the present case = 1,04,787

Consider the NPV of 3 equipments together.

Equipment A : Rs.2,63,791

Equipment B : Rs.1,01,890

Equipment C : Rs.1,04,787

The decision to purchase should invariably be in favour of Equipment A, even though its initial cost is higher than that of Equipment B and C.

Internal Rate of Return

2. IRR must be calculated in order to assess at what point of time in the project the investor will fully recover his /her initial investment. This point is indicated by percentage. If $NPV = 0$, the Present Value of benefits is equal to the Present Value of costs. The time required to recover initial investment may vary from project to project. An investor will clearly opt for a project where he/she can quickly recover the initial investment, when compared to the other projects.

- 2.1. The point, at which the discount factor shows the NPV as zero, is nothing but IRR. In other words IRR exists at the point where $NPV = 0$ or the PV of benefits is equal to PV of costs.
- 2.2. If PV of benefits is more than the PV of cost, ($NPV > 0$) NPV is positive. If PV of benefits is less than the PV of costs, ($NPV < 0$) NPV is negative. If PV of benefits is equal to the PV of costs, ($NPV = 0$) NPV is neutral. IRR exists at the discount factor at which $NPV = 0$.

3. How is IRR calculated? An Example:

- 3.1. A person wanted take up project 'X' with an initial investment of Rs.10, 000. This project involves purchasing of machinery etc., The project is estimated to have life span of 5 years. The estimated Salvage Value of the 'left overs' at the end of the fifth year is Rs.500. The other relevant estimations pertaining to the project are as follows :-

Year	Earning	Cost	Net Cash flow
1	3,000	1,000	2,000
2	3,500	1,000	2,500
3	4,000	1,000	3,000
4	5,000	2,000	3,000
5	5,000	2,000	3,000*

*includes Rs.500 as salvage value of the project.

- 3.2. Here, the earnings mean cash inflow in the form of returns. Cost means 'Operation and Maintenance expenses'. The objective of the IRR calculation is to ascertain discount factor (cost of capital) at which the investor recovers the initial investment of Rs.10, 000 in terms of present value.
- 3.3. Solution: The reader may note that IRR can be determined only by trial and error. A discount factor where $NPV = 0$ cannot be determined all of a sudden. Therefore two different factors must be arbitrarily selected: one yielding positive figure ($NPV > 0$) and another yielding negative figure ($NPV < 0$). Next by using the interpolation formula between these two, IRR can be determined at which $NPV = 0$. In arriving at the following solution by trial and error, one discount factor worked at 10% and the other discount factor worked at 12%.

Year	Net Cash Flow	D. F at 10%	NPV at 10%	D.F. at 12%	NPV at 12%
I	II	III	IV	V	VI
1	2000	0.910	1820	0.893	1786
2	2500	0.827	2068	0.798	1995
3	3000	0.752	2256	0.712	2136
4	3000	0.684	2052	0.636	1908
5	3000	0.621	1863	0.568	1704
	Initial Cost =		10059 -10000		9529 -10000
			+59		-471

4. By using the Interpolation Formula :

$$IRR = 10 + [(12-10 \times \frac{59}{59 - (-471)})]$$

$$= 10 + (2 \times \frac{59}{530})$$

$$= 10 + \frac{59}{265}$$

$$= 10 + 0.22$$

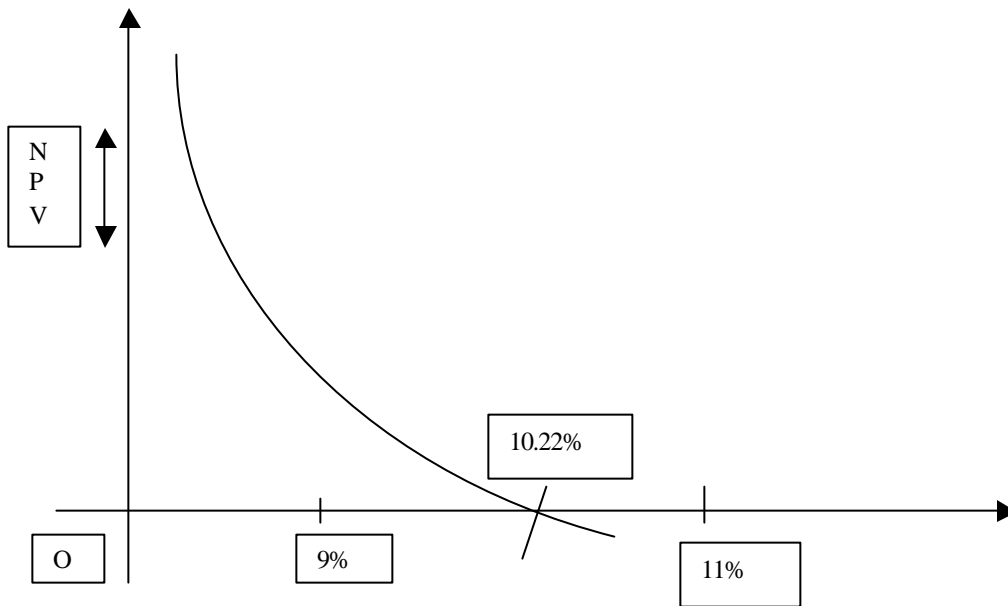
$$= 10.22$$

Therefore IRR = 10.22 %

- 4.1. Therefore, in this case, the investor recovers his/her initial investment at the discount factor of 10.22%, where benefit is equal to costs.
- 4.2. However, if the cost of capital in the present case were to be less than 10.22%, the investor would gain and the project would be viable. For example, if the cost of capital were 9 %, the investor would gain to the extent of the difference between 9% and 10.22 %. The higher the difference between cost of capital and IRR, the higher the return.
- 4.3. Conversely, if the cost of capital is more than 10.22 % (Cost > Benefits), then the project is not viable for the investor.
- 4.4. There must invariably be sufficient difference between the cost of capital and IRR. If the cost of capital is low and the IRR is high, there will obviously be greater difference between costs and benefits, showing the positive effect of NPV. The higher the difference the higher the net benefit. There must be sufficient margin of safety before considering the project as worthy of investment.

5. Graphic presentation.

- 5.1. Graphically, the situation can be represented as follows. In the graph given below, the curve cuts the OX axis at 10.22 %, showing $NPV = 0$. If the cost of capital were 9%, ($NPV > 0$), the benefits would exceed the cost. The gap between the 9% and 10.22 % is the margin of safety. Conversely, if the cost of capital were 11 % ($NPV < 0$), the costs would exceed the benefit.



Discounted Cash Flow Technique

TABLE A PRESENT VALUE OF RE.1/- (SPPWF)

n/r	1.0%	2.0%	3.0%	4.0%	5.0%	6%	7%	8%	9%	10%	11%	12%	13%
1	.9901	.9804	.9709	.9615	.9524	.9434	.9346	.9259	.9174	.9091	.9009	.8929	.8850
2	.9803	.9612	.9426	.9246	.9070	.8900	.8734	.8573	.8417	.8264	.8116	.7972	.7831
3	.9706	.9423	.9151	.8890	.8638	.8396	.8163	.7938	.7722	.7513	.7312	.7118	.6931
4	.9610	.9238	.8885	.8548	.8227	.7921	.7629	.7350	.7084	.6830	.6587	.6355	.6133
5	.9515	.9057	.8626	.8219	.7835	.7473	.7130	.6806	.6499	.6209	.5935	.5674	.5428
6	.9420	.8880	.8375	.7903	.7462	.7050	.6663	.6302	.5963	.5645	.5346	.5066	.4803
7	.9327	.8706	.8131	.7599	.7107	.6651	.6227	.5835	.5470	.5132	.4817	.4523	.4251
8	.9235	.8535	.7894	.7307	.6768	.6274	.5820	.5403	.5019	.4665	.4339	.4039	.3762
9	.9143	.8368	.7664	.7026	.6446	.5919	.5439	.5002	.4604	.4241	.3909	.3606	.3329
10	.9053	.8203	.7441	.6756	.6139	.5584	.5083	.4632	.4224	.3855	.3522	.3220	.2946
11	.8963	.8043	.7224	.6496	.5847	.5268	.4751	.4289	.3875	.3505	.3173	.2875	.2607
12	.8874	.7885	.7014	.6246	.5568	.4970	.4440	.3971	.3555	.3186	.2858	.2567	.2307
13	.8787	.7730	.6810	.6006	.5303	.4688	.4150	.3677	.3262	.2897	.2575	.2292	.2042
14	.8700	.7579	.6611	.5775	.5051	.4423	.3878	.3405	.2992	.2633	.2320	.2046	.1807
15	.8613	.7430	.6419	.5553	.4810	.4173	.3624	.3152	.2745	.2394	.2090	.1827	.1599
16	.8528	.7284	.6232	.5339	.4581	.3936	.3387	.2919	.2519	.2176	.1883	.1631	.1415
17	.8444	.7142	.6050	.5134	.4363	.3714	.3166	.2703	.2311	.1978	.1696	.1456	.1252
18	.8360	.7002	.5874	.4936	.4155	.3503	.2959	.2502	.2120	.1799	.1528	.1300	.1108
19	.8277	.6864	.5703	.4746	.3957	.3305	.2765	.2317	.1945	.1635	.1377	.1161	.0981
20	.8195	.6730	.5537	.4564	.3769	.3118	.2584	.2145	.1784	.1486	.1240	.1037	.0868
21	.8114	.6598	.5375	.4388	.3589	.2942	.2415	.1987	.1637	.1351	.1117	.0926	.0768
22	.8034	.6468	.5219	.4220	.3418	.2775	.2257	.1839	.1502	.1228	.1007	.0826	.0680
23	.7954	.6342	.5067	.4057	.3256	.2618	.2109	.1703	.1378	.1117	.0907	.0738	.0601
24	.7876	.6217	.4919	.3901	.3101	.2470	.1971	.1577	.1264	.1015	.0817	.0659	.0532
25	.7798	.6095	.4776	.3751	.2953	.2330	.1842	.1460	.1160	.0923	.0736	.0588	.0471
26	.7720	.5976	.4637	.3607	.2812	.2198	.1722	.1352	.1064	.0839	.0663	.0525	.0417
27	.7644	.5859	.4502	.3468	.2678	.2074	.1609	.1252	.0976	.0763	.0597	.0469	.0369
28	.7568	.5744	.4371	.3335	.2551	.1956	.1504	.1159	.0895	.0693	.0538	.0419	.0326
29	.7493	.5631	.4243	.3207	.2429	.1846	.1406	.1073	.0822	.0630	.0485	.0374	.0289
30	.7419	.5521	.4120	.3083	.2314	.1741	.1314	.0994	.0754	.0573	.0437	.0334	.0256
35	.7059	.5000	.3554	.2534	.1813	.1301	.0937	.0676	.0490	.0356	.0259	.0189	.0139
40	.6717	.4529	.3066	.2083	.1420	.0972	.0668	.0460	.0318	.0221	.0154	.0107	.0075
45	.6391	.4100	.2644	.1713	.1112	.0727	.0476	.0313	.0207	.0137	.0091	.0061	.0041
50	.6080	.3715	.2281	.1407	.0872	.0543	.0339	.0213	.0134	.0085	.0054	.0035	.0022

- r is the rate of discount and n is the number of time periods.

n/r	16%	18%	20%	22%	24%	26%	28%	30%	32%	34%	36%	38%	40%	45%	50%
1	.8621	.8475	.8333	.8197	.8065	.7937	.7831	.7692	.7576	.7463	.7353	.7246	.7143	.6897	.6667
2	.7432	.7182	.6944	.6719	.6504	.6299	.6104	.5917	.5739	.5569	.5407	.5251	.5102	.4756	.4444
3	.6407	.6086	.5787	.5507	.5245	.4999	.4768	.4552	.4348	.4155	.3975	.3805	.3644	.3280	.2963
4	.5523	.5158	.4823	.4514	.4230	.3968	.3725	.3501	.3294	.3102	.2923	.2757	.2603	.2262	.1975
5	.4761	.4371	.4019	.3700	.3411	.3149	.2910	.2693	.2495	.2315	.2149	.1998	.1859	.1560	.1317
6	.4104	.3704	.3349	.3033	.2751	.2499	.2274	.2072	.1890	.1727	.1580	.1448	.1328	.1076	.0878
7	.3538	.3139	.2791	.2486	.2218	.1983	.1776	.1594	.1432	.1289	.1162	.1049	.0949	.0742	.0585
8	.3050	.2660	.2326	.2038	.1789	.1574	.1388	.1226	.1085	.0962	.0854	.0760	.0678	.0512	.0390
9	.2630	.2255	.1938	.1670	.1443	.1249	.1084	.0943	.0822	.0718	.0628	.0551	.0484	.0353	.0260
10	.2267	.1911	.1615	.1369	.1164	.0992	.0847	.0725	.0623	.0536	.0462	.0399	.0346	.0243	.0173
11	.1954	.1619	.1346	.1122	.0938	.0787	.0662	.0558	.0472	.0400	.0340	.0289	.0247	.0168	.0116
12	.1685	.1372	.1122	.0920	.0757	.0625	.0517	.0429	.0357	.0298	.0250	.0210	.0176	.0116	.0077
13	.1452	.1163	.0935	.0754	.0610	.0496	.0404	.0330	.0271	.0223	.0184	.0152	.0126	.0080	.0051
14	.1252	.0985	.0779	.0618	.0492	.0393	.0316	.0253	.0205	.0166	.0135	.0110	.0090	.0055	.0034
15	.1079	.0835	.0649	.0507	.0397	.0312	.0247	.0195	.0155	.0124	.0099	.0080	.0064	.0038	.0023
16	.0930	.0708	.0541	.0415	.0320	.0248	.0193	.0150	.0118	.0093	.0073	.0058	.0046	.0026	.0015
17	.0802	.0600	.0451	.0340	.0258	.0197	.0150	.0116	.0089	.0069	.0054	.0042	.0033	.0018	.0010
18	.0691	.0508	.0376	.0279	.0208	.0156	.0118	.0089	.0068	.0052	.0039	.0030	.0023	.0012	.0007
19	.0596	.0431	.0313	.0229	.0168	.0124	.0092	.0068	.0051	.0038	.0029	.0022	.0017	.0009	.0005
20	.0514	.0365	.0261	.0187	.0135	.0098	.0072	.0053	.0039	.0029	.0021	.0016	.0012	.0006	.0003
21	.0443	.0309	.0217	.0154	.0109	.0078	.0056	.0040	.0029	.0021	.0016	.0012	.0009	.0004	.0002
22	.0382	.0262	.0181	.0126	.0088	.0062	.0044	.0031	.0022	.0016	.0012	.0008	.0006	.0003	.0001
23	.0329	.0222	.0151	.0103	.0071	.0049	.0034	.0024	.0017	.0012	.0008	.0006	.0004	.0002	.0001
24	.0284	.0188	.0126	.0085	.0057	.0039	.0027	.0018	.0013	.0009	.0006	.0004	.0003	.0001	.0001
25	.0245	.0160	.0105	.0069	.0046	.0031	.0021	.0014	.0010	.0007	.0005	.0003	.0002	.0001	.0000
26	.0211	.0135	.0087	.0057	.0037	.0025	.0016	.0011	.0007	.0005	.0003	.0002	.0002	.0001	
27	.0182	.0115	.0073	.0047	.0030	.0019	.0013	.0008	.0006	.0004	.0002	.0002	.0001	.0000	
28	.0157	.0097	.0061	.0338	.0024	.0015	.0010	.0006	.0004	.0003	.0002	.0001	.0001		
29	.0135	.0082	.0051	.0031	.0020	.0012	.0008	.0005	.0003	.0002	.0001	.0001	.0001		
30	.0116	.0070	.0042	.0026	.0016	.0010	.0006	.0004	.0002	.0002	.0001	.0001	.0000		
35	.0055	.0030	.0017	.0009	.0005	.0003	.0002	.0001	.0001	.0000	.0000	.0000			
40	.0026	.0013	.0007	.0004	.0002	.0001	.0001	.0000	.0000						
45	.0013	.0006	.0003	.0001	.0001	.0000									
50	.0006	.0003	.0001	.0000	.0000										

TABLE B PRESENT VALUE OF RE.1/- RECEIVED PER PERIOD (USPWF)

n/r	1.0%	2.0%	3.0%	4.0%	5.0%	6%	7%	8%	9%	10%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355
3	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.6243	2.5771	2.5313	2.4869
4	3.9020	3.8077	3.7171	3.6299	3.5459	3.4651	3.3872	3.3121	3.2397	3.1699
5	4.3534	4.7135	4.5797	4.4518	4.3295	4.2124	4.1002	3.9927	3.8897	3.7908
6	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.7665	4.6229	4.4859	4.3553
7	6.7282	6.4720	6.2303	6.0020	5.7864	5.5824	5.3898	5.2064	5.0330	4.8684
8	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.9718	5.7466	5.5348	5.3349
9	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.5152	6.2469	5.9952	5.7590
10	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	7.0236	6.7101	6.4177	6.1446
11	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.4987	7.1390	6.8051	6.4951
12	11.2551	10.5753	9.9540	9.3851	8.8632	8.3838	7.9427	7.5361	7.1607	6.8137
13	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	8.3577	7.9038	7.4869	7.1034
14	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.7455	8.2442	7.7862	7.3667
15	13.8650	12.8493	11.9379	11.1184	10.3797	9.7122	9.1079	8.5595	8.0607	7.6061
16	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	9.4466	8.8514	8.3126	7.8237
17	15.5622	14.2919	13.1661	12.1657	11.2741	10.4773	9.7632	9.1216	8.5436	8.0216
18	16.3983	14.9920	13.7535	12.6593	11.6896	10.8276	10.0591	9.3719	8.7556	8.2014
19	17.2250	15.6785	14.3238	13.1339	12.0853	11.1581	10.3356	9.6036	8.9501	8.3649
20	18.0455	16.3514	14.8775	13.5903	12.4622	11.4699	10.5940	9.8181	9.1285	8.5136
21	18.8570	17.0112	15.4150	14.0292	12.8211	11.7641	10.8355	10.0168	9.2922	8.6487
22	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	11.0612	10.2007	9.4424	8.7715
23	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	11.2722	10.3711	9.5802	8.8832
24	21.2484	18.9139	16.9355	15.2470	13.7086	12.5504	11.4693	10.5288	9.7066	8.9847
25	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	11.6536	10.6748	9.8226	9.0770
26	22.7952	20.1210	17.8768	15.9828	14.3752	13.0032	11.8258	10.8100	9.9290	9.1609
27	23.5596	20.7069	18.3270	16.3296	14.6430	13.2105	11.9867	10.9352	10.0266	9.2372
28	24.3164	21.2813	18.7641	16.6631	14.8981	13.4062	12.1371	11.0511	10.1161	9.3066
29	25.0658	21.8444	19.1884	16.9837	15.1481	13.5907	12.2777	11.1584	10.1983	9.3696

30	25.8077	22.3965	19.6004	17.2920	15.3724	13.7648	12.4090	11.2578	10.2737	9.4269
31	26.5423	22.9377	20.0004	17.5885	15.5928	13.9291	12.5318	11.3498	10.3428	9.4790
32	27.2696	23.4683	20.3888	17.8735	15.8027	14.0840	12.6466	11.4350	10.4062	9.5264
33	27.9897	23.9886	20.7658	18.1476	16.0025	14.2302	12.7538	11.5139	10.4644	9.5694
34	28.7027	24.4986	21.1318	18.4112	16.1929	14.3681	12.8540	11.5869	10.5178	9.6086
35	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	12.9477	11.6546	10.5668	9.6442
40	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	13.3317	11.9246	10.7574	9.7791
45	36.0945	29.4902	24.5187	20.7200	17.7741	15.4558	13.6055	12.1084	10.8812	9.8628
50	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	13.8007	12.2335	10.9617	9.9148

n/r	16%	18%	20%	22%	24%	26%	28%	30%	32%	34%	36%
1	0.8621	0.8475	0.8333	0.8197	0.8065	0.7937	0.7813	0.7692	0.7576	0.7463	0.7353
2	1.6052	1.5656	1.5278	1.4915	1.4568	1.4235	1.3916	1.3609	1.3315	1.3032	1.2760
3	2.2459	2.1743	2.1065	2.0422	1.9813	1.9234	1.8684	1.8161	1.7663	1.7188	1.6735
4	2.7982	2.6901	2.5887	2.4936	2.4043	2.3202	2.2410	2.1662	2.0957	2.0290	1.9658
5	3.2743	3.1272	2.9906	2.8636	2.7454	2.6351	2.5320	2.4356	2.3452	2.2604	2.1807
6	3.6847	3.4976	3.3255	3.1669	3.0205	2.8850	2.7594	2.6427	2.5342	2.4331	2.3388
7	4.0386	3.8115	3.6046	3.4155	3.2423	3.0833	2.9370	2.8021	2.6775	2.5620	2.4550
8	4.3436	4.0776	3.8372	3.6193	3.4212	3.2407	3.0758	2.9247	2.7860	2.6582	2.5404
9	4.6065	4.3030	4.0310	3.7863	3.5655	3.3657	3.1842	3.0190	2.8631	2.7300	2.6033
10	4.8332	4.4941	4.1925	3.9232	3.6819	3.4648	3.2689	3.0915	2.9304	2.7836	2.6495
11	5.0286	4.6560	4.3271	4.0354	3.7757	3.5435	3.3351	3.1473	2.9776	2.8236	2.6834
12	5.1971	4.7932	4.4392	4.1274	3.8514	3.6059	3.3868	3.1903	3.0133	2.8534	2.7084
13	5.3423	4.9095	4.5327	4.2028	3.9124	3.6555	3.4272	3.2233	3.0404	2.8757	2.7268
14	5.4675	5.0081	4.6106	4.2645	3.9616	3.6949	3.4587	3.2487	3.0609	2.8923	2.7403
15	5.5755	5.0916	4.6755	4.3152	4.0013	3.7261	3.4834	3.2682	3.0764	2.9047	2.7502
16	5.6685	5.1624	4.7296	4.3567	4.0333	3.7509	3.5026	3.2832	3.0882	2.9140	2.7575
17	5.7487	5.2223	4.7746	4.3908	4.0591	3.7705	3.5177	3.2948	3.0971	2.9209	2.7629
18	5.8178	5.2732	4.8122	4.4187	4.0799	3.7861	3.5294	3.3037	3.1039	2.9260	2.7668
19	5.8775	5.3162	4.8435	4.4415	4.0967	3.7985	3.5386	3.3105	3.1090	2.9299	2.7697
20	5.9288	5.3527	4.8696	4.4603	4.1103	3.8083	3.5458	3.3158	3.1129	2.9327	2.7718
21	5.9731	5.3837	4.8913	4.4756	4.1212	3.8161	3.5514	3.3198	3.1158	2.9349	2.7734
22	6.0113	5.4099	4.9094	4.4882	4.1300	3.8223	3.5558	3.3230	3.1180	2.9365	2.7746
23	6.0442	5.4321	4.9245	4.4985	4.1371	3.8273	3.5592	3.3253	3.1197	2.9377	2.7754
24	6.0726	5.4509	4.9371	4.5070	4.1428	3.8312	3.5619	3.3272	3.1210	2.9386	2.7760
25	6.0971	5.4669	4.9476	4.5139	4.1474	3.8342	3.5640	3.3286	3.1220	2.9392	2.7765
26	6.1182	5.4804	4.9563	4.5196	4.1511	3.8367	3.5656	3.3297	3.1227	2.9397	2.7768
27	6.1364	5.4919	4.9636	4.5243	4.1542	3.8387	3.5669	3.3305	3.1233	2.9401	2.7771
28	6.1520	5.5016	4.9697	4.5281	4.1566	3.8402	3.5679	3.3312	3.1237	2.9404	2.7773
29	6.1656	5.5098	4.9747	4.5312	4.1585	3.8414	3.5687	3.3316	3.1240	2.9406	2.7774

30	6.1772	5.5168	4.9789	4.5338	4.1601	3.8424	3.5693	3.3321	3.1242	2.9407	2.7775
31	6.1872	5.5227	4.9824	4.5359	4.1614	3.8432	3.5697	3.3324	3.1244	2.9408	2.7776
32	6.1959	5.5277	4.9854	4.5376	4.1624	3.8438	3.5701	3.3326	3.1246	2.9409	2.7776
33	6.2034	5.5320	4.9878	4.5390	4.1632	3.8443	3.5704	3.3328	3.1247	2.9410	2.7777
34	6.2098	5.5356	4.9898	4.5402	4.1639	3.8447	3.5706	3.3329	3.1248	2.9410	2.7777
35	6.2153	5.5386	4.9915	4.5411	4.1644	3.8450	3.5708	3.3330	3.1248	2.9411	2.7777
40	6.2335	5.5482	4.9966	4.5439	4.1659	3.8458	3.5712	3.3332	3.1250	2.9412	2.7778
45	6.2421	5.5523	4.9986	4.5449	4.1664	3.8460	3.5714	3.3333	3.1250	2.9412	2.7778
50	6.2463	5.5541	4.9995	4.5452	4.1666	3.8461	3.5714	3.3333	3.1250	2.9412	2.7778

LEARNING UNIT - II

**“Discounted Cash Flow Technique
and Internal Rate of Return”**

[Instructions to Faculty]

**Administrative Training Institute
Lalithamahar Road, Mysore - 570 011**

Learning Unit-2
Instructions to Faculty

Recap on Learning Unit-I

1. Before commencement of Learning Unit II, the Faculty may spend approximately half an hour to make a recap of the Learning Unit-I with reference to the following 10 questions:
 1. What is the objective of Trading Account ?
 2. What is the Objective of Profit and Loss Account ?
 3. What are the differences between the (i) Authorised Capital (ii) Issued Capital and (iii) Subscribed Capital ?
 4. Who are the real owners of a company ?
 5. What is the difference between the inside liabilities and the outside liabilities ?
 6. What are solvency ratios ?
 7. What are liquidity ratios ?
 8. What is gearing ? What is low gearing and what is high gearing ?
 9. What is debt equity ratio ?
 10. What is an operating cycle ?

Discounted Cash Flow technique and Internal Rate of Return

1. Objectives :

- 1.1. At the end of this Learning Unit, the participants will be able to :-
- Calculate the present value of money receivable in future
 - Use SPPWF and USPWF tables to calculate the PV of cost of returns
 - Calculate the most economical decision
 - Calculate the net present value (NPV)
 - Calculate the Internal rate of return (IRR)

2. Sub-Units of Learning Unit-2

1.	Meaning and objective of DCFT
2.	Present value of formulae with examples
3.	Using of Discount factors with examples
4.	Using of SPPWF table with examples
5.	Using USPWF table with examples
6.	Calculation of Internal rate of return

3. Instructions to Faculty :

- 3.1. Make a presentation in the sequence listed below, using visual aids Nos. 13 - 19:
- ↗ Explain the time value of money and meaning of discount factor, the advantages of using DCFT and to which situations DCFT can be applied
 - ↗ Give simple examples, for example returns accruing on National Savings Certificates, Fixed Deposits etc.,
 - ↗ Explain with examples the method of calculating future value of money by using Compound Interest
 - ↗ Explain how present value (PV) can be calculated by reversing the Compound Interest Formulae
 - ↗ Explain how discount factor can be used.

- ⇒ Explain how SPPWF and USPWF have been constructed and how it can be used with examples.
- ⇒ Explain the meaning and the purpose IRR
- ⇒ Explain how scientific it is to use IRR to take investment decisions with calculations and graphs
- ⇒ Explain the meaning of Salvage Value.
- ⇒ Explain how interpolation formulae can be used to determine the IRR
- ⇒ Explain with examples how to calculate NPV

Visual Aid -13: Discounted Cash Flow Technique

Discounted Cash Flow Technique

- Objective and Scope
- Present Value of money
- Common point of time
- $FV = PV \times (1 + r)^n$
- $PV = FV \times \frac{1}{(1 + r)^n}$

Visual Aid - 14: SPPWF & USPWF

SPPWF and USPWF:

- Use of SPPWF and USPWF tables
- Discount Factors
- Opportunity cost
- Net present value

Note:- Faculty to explain the use of table with examples on the black board, instead of using PV formula.

Visual Aid -15: Purchase Decisions

Purchase decision		
Equipments	Initial Cost (Rs.)	NPV (Rs.)
A	19,00,000	2,63,791
B	18,00,000	1,01,890
C	17,00,000	1,04,787

Note: Faculty to explain with reference to the reading materials for LU 2, why equipment 'A' should be purchased after calculation of NPV.

Visual Aid -16: Internal Rate of Return

Internal Rate of Return; Example: Initial Cost: Rs.10,000			
Year	Earning	Cost	Net Cash Flow
1	3,000	1,000	2,000
2	3,500	1,000	2,500
3	4,000	1,000	3,000
4	5,000	2,000	3,000
5	5,000	2,000	3,000*
* Includes Rs.500 as Salvage Value			

Visual Aid -17: Internal Rate of Return

(Solution to problem posed in Visual Aid 16)

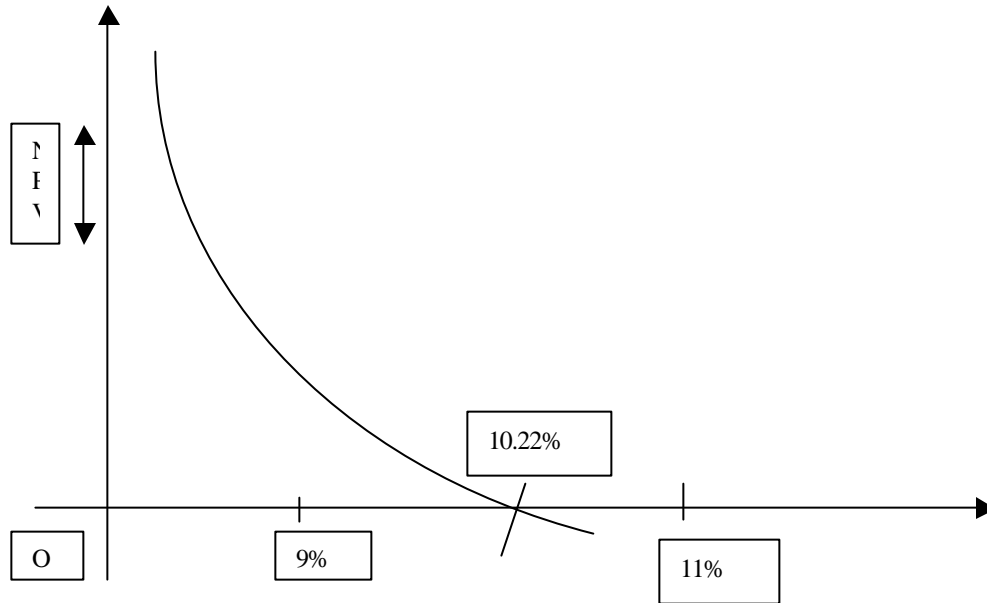
Year	Net Cash Flow	D.F. at 10%	NPV at 10%	DF at 12%	NPV at 12%
1	2,000	0.910	1,820	0.893	1,786
2	2,500	0.827	2,068	0.798	1,995
3	3,000	0.752	2,256	0.712	2,136
4	3,000	0.684	2,052	0.636	1,908
5	3,000	0.621	1,863	0.568	1,704
	Initial Cost	--	10,059 (-) 10,000	--	9,529 (-)10,000
			(+) 59	--	(-) 471

Visual Aid -18: Interpolation Formula

Interpolation formula to determine IRR

$$\begin{aligned}
 & \text{IRR} - 10 + (12-10) \times \left(\frac{59}{59 - (-471)} \right) \\
 &= 10 + 2 \times \left(\frac{59}{530} \right) \\
 &= 10 + 0.22 \\
 &\text{IRR} = 10.22\%
 \end{aligned}$$

Visual Aid -19: Graphic Presentation



4.Group exercise:

- 4.1. After the faculty has made a presentation based on the above visual aids No 13 - 19, faculty may give exercise described in the Handout on Group Activities to the participants for application of DCFT for purchase decisions and calculation of IRR.
- 4.2. The task on DCFT will be given to two groups; each group will work separately. One hour time limit is sufficient to discuss, to workout the application, to take decisions, and to prepare visual aids. In addition, 30 minutes will be required for group presentations for moderation.
- 4.3. Similarly, the other 2 groups will be given the task of calculating the IRR to assess the viability of the project. Each group will work separately.
- 4.4. After the groups have made their presentations, the faculty should document the critical learning points

LEARNING UNIT -III

B u d g e t

- A. Performance Budgeting
- B. Zero Base Budgeting
- C. Cost - Benefit Analysis

[GROUP ACTIVITIES]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Learning Unit-3

Budget

1. Group Activities

- 1.1 Each group will be given reading materials and details of group activities. Each group should read the material supplied, discuss solutions to the exercise given in the group activities and make presentations thereon.
- 1.2 Each group will be given sufficient time to discuss and to prepare visual aids for presentation.

2. Group 1:

- 2.1 Group 1 will be assigned the task of designing a responsibility centre by using the concept of performance budgeting.
- 2.2 The group will select a responsibility centre of their choice and design the same as per check list given in the reading materials.
- 2.3 The time for presentation and moderation will be approximately 30-40 minutes.
- 2.4 After the group presentation, the participants will list out the learning points in the plenary.

3. Group 2:

- 3.1 Group 2 will work on an application of Zero Based Budgeting. Group 2 will select a decision unit, list out 5 to 10 decision packages under the selected decision unit, and choose one specific decision package to design with reference to the points in the Reading Material.
- 3.3 Approximately, two hours will be given for the group to discuss and to prepare the visual aids for presentation. In addition, 30-40 minutes will be available for presentation and moderation.
- 3.4 After the group presentation, the participants will list out the important learning points in the plenary.

Note: Both the first group and second group may assume approximate financial figures for the purpose of class-room exercise. Lack of exact financial figures cannot be assumed

as a major constraint. Approximate figures selected by the group for designing and analyzing will serve the purpose.

4.Groups- 3 and 4

- 4.1 Group 3 will undertake a cost-benefit analysis on the case study, entitled 'The Demodas valley flood control scheme' by Ajit K. Dasgupta and D.W. Pearce.
- 4.2 Group 4 will undertake a cost-benefit analysis on the case study, entitled 'The Damodar valley Flood control scheme' also by Ajit K. Dasgupta and D.W. Pearce
- 4.3 In order to make an effective analysis the groups should refer to the reading materials in Learning Unit-3.C.
- 4.4 There will be sufficient time for discussion and preparation of visual aids. Approximately 30-40 minutes will be available for presentation and moderation.
- 4.5 All the groups will list out the learning points in the plenary.

CASE STUDY

The Damodar Valley Flood Control Scheme

(Ajit.K. Dasgupta and D.W. Pearce)

The last chapter studied the application of cost-benefit analysis to the choice of site for a particular project. The present chapter is concerned with evaluating a project is already in operation.

1. THE DAMODAR VALLEY SYSTEM

The Damodar river rises in the Palamau hills, Bihar (north-east India), at an elevation of about 2000 feet. It flows eastwards for about 180 miles through Bihar and enters the deltaic plains of West Bengal below the coal-mining centre of Raniganj (see Fig. 1). It continues to flow east and as it reaches the boundary of Burdwan district it is joined by the river Barakor. The enlarged river flows along the boundary of Bankura and Burdwan districts and then into the Burdwan district, passing just south of Burdwan town. About ten miles east of Burdwan town, the river abruptly changes its course and turns south. It bifurcates into the rivers Mudeswari and Damodar about two miles before entering Hooghly district. In the extreme southern part of Hooghly district, some thirty miles below Calcutta, it joins the Hooghly river which reaches the sea shortly afterwards.

The catchments area of the river at its mouth is about 8500 square miles, of which nearly 7000 square miles is the catchments area of the upper Damodar. (The confluence with Barakor River is regarded as separating the upper and the lower stretches of the Damodar.)

The topography of the Damodar valley changes from hilly and forest regions in the upper portion of the drainage area to the flat deltaic plains of the lower region. This is reflected also in the slope of the river, which is 10 feet per mile in the first 150 miles of its course, 3 feet per mile in the next 100 miles and less than 1 foot per mile in the last 90 miles.

The Damodar is a flood-prone river. Since at least as far back as 1730, it has been known to overflow its banks during the rainy season, leading to devastating floods in the lower valley.

The occurrence of floods along the Damodar River is due in the first instance to heavy storm-rainfalls during the monsoon period, and more generally to certain characteristics of the river regime. Thus, in the earlier part of its course the river flows very rapidly, eroding land and collecting silt, a tendency which has been accelerated by deforestation in the upper reaches. In its lower reaches, the flat deltaic plains of West Bengal, it becomes a sluggish stream and discharges its flood waters and silt along its banks.

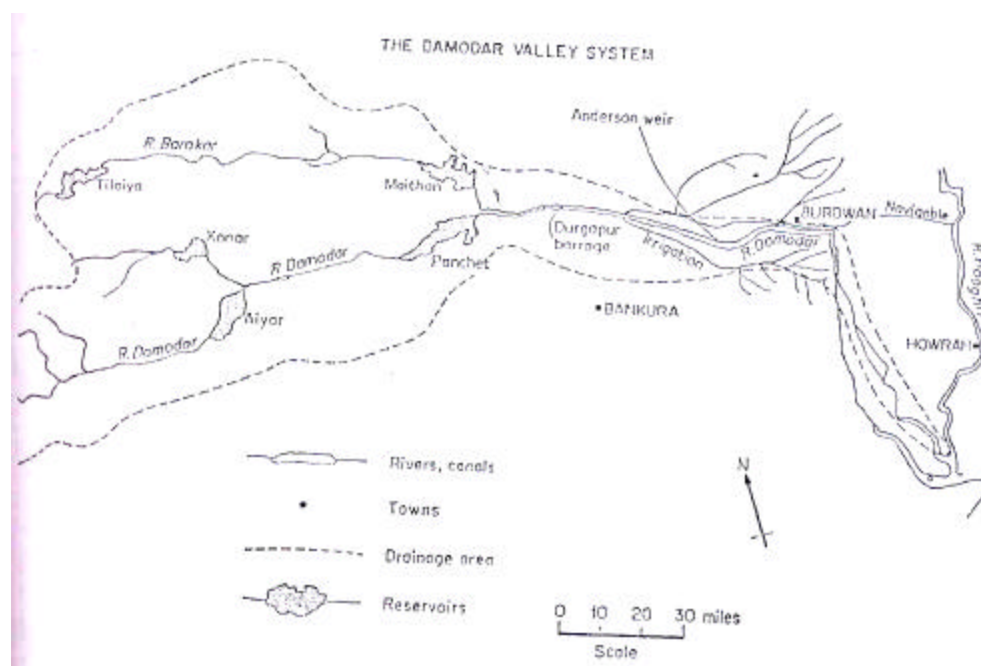


Table1. Allocation of storage Capacities in the D.V.C. Dams

	Tilaiya		Konar		Maithon		Panchet		Total	
	Storage Capacity *	%	Storage Capacity *	%	Storage Capacity *	%	Storage Capacity *	%	Storage Capacity *	%
Irrigation and Power	135	36	179	66	496	45	185	15	975	33
Flood Control	140	45	45	16	440	40	881	73	1510	52
	88	19	49	18	168	15	148	12	426	15
To top of gate	363	100	273	100	1104	100	1214	100	2911	100

*in thousand acre feet

Source DVC data Book (1966)

The system of dams and reservoirs designed to develop and control the waters of the Damodar valley is administered by a public corporation- the Damodar Valley Corporation (D.V.C.). The control system is generally referred to as the D.V.C. system. It consists of four dams, Tilaiya and Maithon on the Barakor, and Konar and Panchet Hill on the river Damodar (Fig. 1). Of these, Tilaiya is a concrete gravity dam while the others are earth dams with a concrete spillway. The total storage capacity of the four dams together amounts to 2.9 million acre-feet, which is allocated between the different objectives as shown in Table 1.

In addition to the four dams, the system includes a hydro power station at each of the dams except Konar; thermal power stations; the Durgapur barrage; and numerous irrigation canals off the barrage. Some characteristics of the lower Damodar valley are described in Table 2.

Table 2 Classification of Area of Some Districts in the Lower Damodar Valley
According to Some Characteristics, 1962-3 (in thousand hectares)

	Characteristics	Burdwan	Bankura	Howrah	Hooghly	Purulia
(a)	Area irrigated by various canals *	259.30	118.10	24.50	109.20	78.10
(b)	Area available for cultivation	542.70	507.00	118.30	251.10	446.20
(c)	Area sown more than once	32.80	19.40	19.50	47.70	14.10
(d)	Net area sown	495.10	346.60	95.30	239.10	236.20
(e)	Area not available for cultivation γ	139.80	39.30	36.80	62.60	89.30
(f)	Current fallows	11.80	81.50	8.70	2.60	79.10
(g)	Other uncultivated land, excluding current fallows	35.80	78.90	14.30	9.40	130.90
(h)	Total area of the district	700.71	685.54	145.08	313.92	623.42

* Relates to 1960-1.

γ Excluding forest area.

Source: Directorate of Agriculture, West Bengal.

The capacity costs of the project are shown in Table 3.

Table 3 Capacity Costs of D.V.C. Dams

	Tilaiya	Konar	Maithon	Panchet
Storage capacity to top of gate (thousand acre-feet)	320	275	1104	1214
Total cost in million rupees	37.1	97.5 *	179.3	191.4
Cost per acre-foot in rupees	116	357	162	157

* Exclusive of the costs of the hydroelectric station.

Source: Data supplied by the D.V.C.

The estimated lifetimes of the component dams are as shown in Table 4.

Table 4: Estimated Lifetime of D.V.C. Dams

Dam	Estimated lifetime in years
Tilaiya	151
Konar	219
Maithon	246
Panchet	75

2. FLOOD CONTROL AND COST-BENEFIT ANALYSIS

The project studied in this chapter has considerable significance in terms of the problems discussed in Chapters 1-8, especially in the following respects. Firstly, the benefits of a flood-control project during a particular year depend on whether or not a flood occurs in that year, and this cannot be known in advance. Hence, in evaluating such a project, the problems of risk and uncertainty, considered in Chapter 8, are involved in an essential way. Our discussion in chapter 8, are involved in an essential way. Our discussion in Chapter 8 reached the conclusion that under conditions of risk and uncertainty the expected utility criterion provides the most generally acceptable method of project evaluation. We shall attempt to use this approach in the present case, subject to the usual limitation that utility has to be measured in monetary units, appropriate price data being used for this purpose. In a sense, the whole of the present chapter can thus be regarded as an extended appendix to Chapter 8.

Secondly, our objective is to develop a method for evaluating the benefits not only of the project as it now stands but also of possible variants of it. The question of the potential benefits of 'complete protection' against possible floods compared to the partial protection that is currently provided by the D.V.C. project is relevant here. The D.V.C. project as originally conceived was supposed to build at least six dams and provide enough flood storage capacity to prevent any flood damage in the area. Subsequently it was decided to provide only partial flood protection and the number of dams was reduced to four. It has often been suggested that the storage capacity should actually be increased so that the original purpose of the project may be fulfilled. An evaluation of the social benefit of complete protection in the area is thus a matter of some practical importance and relates clearly to the problem of evaluating 'given' as opposed to 'variable scale' projects discussed in Chapter 5. We shall attempt to develop a conceptual framework which enables us to make such an evaluation.

Thirdly, we shall confine ourselves to the evaluation of benefits only. We make no attempt at a systematic analysis of costs. In particular, the existing allocation of storage capacity costs as between different objectives of the system, e.g. irrigation, power, flood control, etc., is taken as given. Since a multiple-purpose river-valley scheme such as this one can properly be regarded as an indivisible unit, such an allocation is necessarily arbitrary in some degree.

Finally, our main concern throughout is to illustrate principles rather than to deal exhaustively with all the problems that actually arise.

3. THE 'OFFICIAL' APPROACH TO BENEFIT ESTIMATION

While there has been a great deal of study of flood-control problems in India from the engineering and hydrological points of view, on the economic aspects of flood control little systematic research appears to have been done.

The authors of the *D.V.C. Data Book* point out that ‘curves establishing relations between flood storage versus damage in the lower valley have not been worked out after a carefully planned survey of the affected regions after the occurrence of floods’, and that, in consequence, the benefits of the moderation of floods achieved by the use of the *D.V.C.* dams have not yet been assessed on a scientific basis. An approximate appraisal of the flood-control benefits of *D.V.C.* is attempted in the *Data Book* as follows.

Firstly, the moderation of floods by the *D.V.C.* reservoir system since it started operating in 1958 is described. This is shown here in Table 5

Table 5 Date	Actual Moderation of Damodar Floods, 1958-63	
	Peak flow (without dams) In thousand cusecs*	Moderate flow at dams in thousand cusecs*
23-24 July 1958	228	30
12-13 Aug 1958	126	32
16-17 Sept 1958	555	175
11 July 1959	134	71
21-22 July 1959	137	90
10 Sept 1959	137	101
13 Sept 1959	137	56
1-2 Oct 1959	623	288
25-26 Aug 1960	119	72
30 Aug 1960	173	104
27-28 Sept 1960	348	92
22-23 Aug 1961	110	64
10-11 Sept 1961	118	44
2-3 Oct 1961	516	161
25-26 July 1962	117	44
22-23 Sept 1962	152	45
28-29 Sept 1963	216	41
2-3 Oct 1963	451	121
24-25 Oct 1963	465	91

* A cusec is one cubic foot per second.

Source: *D.V.C. Data Book* (1966).

Secondly, the relationship between the flood discharge and the area affected is stated to be as in Table 6

Table 6: Relationship between Flood Discharge and Area Affected

Flood discharges	Region affected	Area in square miles
Less than 100,000 cusec	None	0
100,000 to 200,000 cusec	Amta - Mudeswari	300
200,000 to 300,000 cusec	Amta - Mudeswari and Raina Area	500
300,000 cusec and above	Amta - Mudeswari, Raina and left-bank area	1500

Thirdly, the number of occasions when the different areas would have been affected without dams and the number of occasions when they were actually affected with dams are listed in Table 7.

Table 7

Data	Amta-Mudeswari without dams	Area with dams	Raina without dams	Area with dams	Left bank without dams	Area with dams
23-24 July 1958	*	-	*	-	-	-
12-13 Aug 1958	*	-	-	-	-	-
16-17 Sept 1958	*	*	*	-	*	-
11 July 1959	*	-	-	-	-	-
21-22 July 1959	*	-	-	-	-	-
10 Sept 1959	*	-	-	-	-	-
13 Sept 1959	*	-	-	-	-	-
1-2 Oct 1959	*	*	*	*	*	-
25-26 Aug 1960	*	-	-	-	-	-
30 Aug 1960	*	-	-	-	-	-
27-28 Sept 1960	*	-	*	-	*	-
22-23 Aug 1961	*	-	-	-	-	-
10-11 Sept 1961	*	-	-	-	-	-
2-3 Oct 1961	*	*	*	-	*	-
25-26 July 1962	*	-	-	-	-	-
22-23 Sept 1962	*	-	-	-	-	-
28-29 Sept 1963	*	-	*	-	-	-
2-3 Oct 1963	*	*	*	-	*	-
24-25 Oct 1963	*	-	*	-	*	-
Total of occasions	19	4	8	1	6	0

* Shows area was affected;
- shows area was not affected.

The Benefits due to flood control are considered to be two fold: (i) the saving of crops, and (ii) the protection of property. The probable damage due to flood inundation is estimated from the previous data together with the further assumptions that (a) the intensity of cultivation is 80 per cent, (b) the average yield of the crop (paddy) is 25 maunds per acre (=2056 lb per acre), (c) the price of paddy is Rs.15 per maund (i.e. Rs.0.18 per lb) and (d) flooding of the left-bank area causes damage to property to the extent of about Rs.200 million, in addition to the damage to agricultural production.

On these assumptions, the losses due to damage in the Amta-Mudeswari area are put at Rs. (300 X 0.8 X 640 X 25 X 15)= Rs.60 million. Similarly, the damage due to flooding in the Raina area is put at Rs.40 million and that due to flooding of the left bank at Rs.400 million.

Hence the damage that would have occurred without dams is put at Rs.(19 X 60 + 8 X 40 + 6 X 400) million =Rs.3860 million. The damage with the dams is estimated to be Rs. (4 X 60 + 40) million =Rs.280 million. Hence the reduction in damage due to the dams is estimated as Rs.3580 million.

Since this refers to the period 1958-64, the corresponding average flood benefit per year becomes Rs. 3580 million = Rs.51 million approximately.

4. AN ALTERNATIVE APPROACH TO BENEFIT ESTIMATION

The method of evaluating flood-control benefits described above is based on the correct idea that these benefits consist in the reduction of flood damage that the project in question makes possible. However, the method suffers from a number of inadequacies.

Firstly, in using the sample observations during 1958-64 to derive the project benefits of flood control, the method appeals implicitly to the theory of probability; but it fails to specify a well-defined probabilistic model which can serve as a basis for prediction.

Secondly, the sample itself is too small.

Thirdly, the method does not lend itself conveniently to an analysis of the variations in project benefit corresponding to variations in the reservoir operation policy.

Fourthly, the inclusion of all flood discharges above 100,000 cusecs in a given year leads to double-counting of crop damage and hence to overestimation of flood-control benefit.

Because of these defects in the method used by the authorities of D.V.C. and as the more conventional analysis based on the 'stage-damage curve' (which relates various flood stages to the associated levels of flood damage) is ruled out by the shortage of data, we shall attempt to develop an alternative approach in terms of which the data that are available can best be utilized.

The basis assumption underlying our approach is that flood damage is a function of the peak flow only (cf. Maass et al.[1] pp.287-8). In fact, the level of damage depends also on such considerations as the time of year (which, for example, affects the maturity of crops), the velocity of flow, the physical and chemical properties of flood waters and the depth and duration of inundation. The use of peak flow as the determinant of flood damage only provides a convenient first approximation (By defining 'peak flow' as the yearly maximum of 'average daily flows' (rather than as 'momentary peaks'), one can also, to some extent, implicitly take duration into account).

If flood damage can be regarded as related predominantly to the level of flood discharge, as is often the case, the benefits of flood control per period can be written as

$$B = \int_{x^1}^x p(x) \{c(x) - c(x^1)\} dx$$

Where $p(x)$ denotes the probability density of peak flow x ;
 $c(x)$ is the corresponding social cost ('flood damage'); and
 x^1 denotes the moderated outflow corresponding to the flood discharge level x .

In the case of a reservoir storage system of flood control, let $x^1 = ?(x)$ represent the reservoir operation policy. Then, substituting this equivalence into the first equation gives

$$B = \int_x p(x) \{c(x) - c(x^1)\} dx$$

Assuming a stationary probability distribution $p(x)$ over the relevant period, the present value of an annuity of B per period over the life of the project at the appropriate rate of discount gives the gross benefit of the project. By subtracting from this figure the relevant investment and operation costs similarly 'discounted' to the base year; we can get the appropriate measure of the net benefit of the project.

If $c(x^1) = 0$, we have $B = \int_x p(x) \cdot c(x) \cdot dx$ which represents

Gross benefit of complete protection. The corresponding present value gives the 'expected present social value' of complete protection. A comparison of this value with the social cost involved can in principle determine whether complete protection is 'worth while'.

It is likely that the reservoir operation policies as represented by $x^1 = ?(x)$ will vary with the peak flow, x . Suppose they vary as follows:

If $x > x_1$, then $x^1 = ?_1(x)$;
 If $x_1 = x < x_2$, then $x^1 = ?_2(x)$

 And so on.

The gross benefit of flood control becomes

$$B = \int_x p(x) \{c(x) dx + [\int_{x_1}^{\infty} p(x) c(?_1(x)) dx + \int_{x_2}^1 p(x) c(?_2(x)) dx + \dots]\}$$

Given the operating policy, the probability distribution $p(x)$ and the flood damage function $c(x)$, B can be readily calculated.

5. AN APPLICATION OF THE ALTERNATIVE APPROACH

In this section, the principles described in section 10.4 are applied in order to evaluate flood-control policies in the Damodar Valley Project. There are two main problems; (a) the estimation of the probability distribution of the peak flow; and (b) the estimation of the peak flow/flood damage relationship. These problems are taken up in turn.

(a) Probability Distribution of Peak flow

The probability distribution of the peak flow was derived from the data on the yearly maximum of average daily discharges in cusecs. These are given in Table 8 below. (The reader who is not familiar with the mathematics used can safely skip the section which derives the probability distribution.)

Table 8

Peak Flows at Rhondia, 1935-52
(thousand cusecs)

Year	Maximum of average daily discharges
1935	422.5
1936	174.5
1937	121.7
1938	61.9
1939	258.5
1940	266.5
1941	625.0
1942	375.0
1943	251.3
1944	153.5
1945	120.9
1946	313.7
1947	259.6
1948	229.7
1949	230.1
1950	245.9
1951	347.4
1952	168.3

The statistical theory of extreme values, as developed by Gumbel [2] and others, was applied to derive the probability distribution of the peak flow. The logic of the theory can be described briefly as follows. Consider a sample containing n independent observations on a continuous variate x . We seek the probability distribution of the maximum value of x in the sample. Clearly, the probability distribution of x and on the sample size. Thus, let $f(x)$ be the probability distribution of x and let $F(x)$ be the probability that the value x is the largest among n independent observations.

Then $\phi_n(x) = \{F(x)\}^n$

Where $F(x) = \int_{-\infty}^x f(x) dx$ is the cumulative probability distribution of x

As is usual in the analysis of flood data, we assume that the initial distribution of x is the exponential type:

$$F(x) = e^{-x}$$

It can then be shown that

$$\lim_{n \rightarrow \infty} \Phi_n(x) = e^{-e^{-y}}$$

Where y is a transform of x such that

$$Y = a_n(x - u_n),$$

With $1/a_n$ and u_n having the same dimension as x , so that y is a pure number.

Hence, the double exponential distribution $e^{-e^{-y}}$ represents the cumulative probability distribution of the reduced variety. The derivative of this gives the corresponding probability distribution (probability density function) desired.

There are two possible approaches to the estimation of the theoretical distribution of the largest value.

Firstly, if we know the functional form of the initial distribution and the values of its parameters as well as the sample size n , then the parameters a_n and u_n , can be obtained directly.

Secondly, if, as is more usual, the initial distribution is unknown, we can still estimate the parameters a_n and u_n , provided we assume that the distribution is of the exponential type. In this case, there are a number of alternative methods for estimating the parameters a_n and u_n . We shall follow the large-sample modified least squares method described by Gumbel ([2] pp. 35, 168-9).

As Gumbel shows, for large n , a_n and u_n can be estimated with a reasonable degree of approximation independently of n . The estimates depend only on the sample distribution of extreme values and are derived by the normal equations

$$\frac{1}{a} = \frac{Sx}{N}$$

$$u = x - \frac{Y_n}{a}$$

Where Sx , x denote respectively the standard deviation and mean of observations of the extreme values and N , Y_n are functions of the number N of extreme values observed. The values of a_n and Y_n as functions of N have been tabulated by Gumbel ([2] p.228).

The parameters of the theoretical distribution are now calculated for the data of Table 8. They are shown in Table 9, below.

Table 9: Estimation of Parameters

	Peak Flow: Maximum of average Daily discharges
N= Number of observations of largest value	18
\bar{x} Sample mean (thousand cusecs)	257.05
S_x = Sample standard deviation (thousand cusecs)	127.05
a_n	1.0493
Y_n	0.5202
$1/a$ (thousand cusecs)= S_x/a_n	121.08
u (thousand cusecs)= $\bar{x} - Y_n/a$	194.04

Having calculated the constants, we can now proceed to derive the observed and theoretical distributions of the largest value for each of the two types of peak-flow data considered. These are shown in Table 11

Column 1 of Table 11 shows values of the reduced variate at intervals of 0.25, the length of the class interval being necessarily arbitrary. Column 2 gives the corresponding values of y as calculated from Becker's tables [3]; it gives the cumulative probability of y for each value of y tabulated in column 1. Column 3 is derived by multiplying each item in column 2 by the sample size; it gives the theoretical cumulative frequency. Column 4 gives the first differences of successive entries in column 3 and represents the theoretical frequencies in each class interval.

The peak flows x , equal to the yearly maximum of average daily discharges obtained by letting y take on the values shown in column 1, are given in column 5 ($x = Y/a + u$; a , u being found from Table 9). The cumulative observed frequencies corresponding to these values of x are derived from Table 10 which gives the peak-flow data of Table 8 ranked in ascending order. These are given in column 6. Column 7 is obtained by taking first differences of the figures in column 6. These show the observed frequencies for the same class intervals for which the theoretical frequencies were calculated.

Table 10

Ranking of Peak Flows in Ascending Order

(Peak flow= yearly maximum of average daily discharges)

Rank	Peak flow (thousand cusecs)
1	61.9
2	120.9
3	121.7
4	153.5
5	168.3
6	174.5
7	229.7
8	230.1
9	245.9
10	251.3
11	258.5
12	259.6
13	266.5
14	313.7
15	347.4
16	375.0
17	422.5
18	625.0

The cumulative frequency distributions for theoretical and observed peak flows as calculated above are graphically represented in Fig. 8. (Peak flow= yearly maximum of average daily discharges). The observed and theoretical cumulative distribution show close agreement. This provides some justification for the use of the estimated distribution for the assessment of flood damage in this region.

Table 11: Theoretical and Observed Distribution of Peak Flow
(maximum of average daily discharges)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Reduced variable	Theoretical cumulative probability	Theoretical cumulative frequency	Theoretical frequency	Observed peak flow	Observed cumulative frequency	Observed frequency
- 1.00	0.6599	1	1	73	1	1
- 0.75	0.12039	2	1	103	1	0
- 0.50	0.19230	4	2	133	3	2
- 0.25	0.27693	5	1	164	4	1
0.00	0.36788	7	2	194	6	2
0.25	0.45896	8	1	224	6	0
0.50	0.54524	10	2	255	10	4
0.75	0.62352	11	1	285	13	3
1.00	0.69220	13	2	315	14	1
1.25	0.75088	14	1	345	14	0
1.50	0.80001	14	0	376	16	2
1.75	0.84048	15	1	406	16	0
2.00	0.87342	16	1	436	17	1
2.25	0.89996	16	0	466	17	0
2.50	0.92119	17	1	497	17	0
2.75	0.93807	17	0	527	17	0
3.00	0.95143	17	0	557	17	0
3.25	0.96197	17	0	587	17	0
3.50	0.97025	18	1	618	17	0
3.75	0.97675	18	0	648	18	1

(b) The Relationship between Peak flow and Flood Damage

The relationship between peak flow and flood damage was derived in two stages: (1) the relationship between peak flow and area inundated, and (2) the calculation of the damage per unit area inundated.

The choice of this method was dictated by the lack of data required for more sophisticated methods of analysis. Since, in the area concerned, flood damage consists predominantly of damage to agricultural output; it is believed that the method provides reasonably satisfactory estimates of flood damage.

The relationship between the flood intensity and the are inundated was derived from the observations listed in Table 12.

Table12

Discharge at Rhondia (thousand cusecs)	Area inundated (square miles)
150	360
200	386
250	405
300	423
400	454
500	479
600	500

Source: Report of the Committee for the Augmentation of Water Resources of Damodar Valley Corporation (Calcutta, 1959) p.52.

A linear regression $y = a + \beta x$ was fitted to the data by the standard least-squares method and gave the following results :

$$\begin{aligned} a &= 324\,930 \\ \beta &= 0.305 \\ r^2 &= 0.944 \end{aligned}$$

$$r \text{ v } 5$$

$$t = \frac{r \text{ v } 5}{\sqrt{1 - r^2}} = 9.215.$$

The function = $y = 324.93 + 0.305x$

Was used for calculating the area inundated, y , for a given discharge, x . (See above for the derivation of this equation. The relationship between the theoretical and observed values suggested that a linear regression was justified.)

To calculate the damage per unit of is inundated, we made the same assumptions that were used by the D.V.C. in computing their own estimates of flood damage, namely:

- The intensity of cultivation is 80 per cent.
- Paddy is the only crop grown
- The average yield of paddy is 2056 lb per acre
- The average price of paddy is Rs.0.18 per lb.

The probability distribution of the peak flow together with the discharge/flood-damage relationship enable the gross benefit of flood-control policies as described to be computed. For this purpose, the maximum of average daily discharges measure of the peak flow was used, since this appeared to be the concept of most closely related to the data of Table 12, from which the linear regression of the area inundated on flood discharge was computed.

We then have the annual expected area inundated

$$= 324.93 + [0.305 \times 257.03] = 403.38 \text{ square miles}$$

(The sample mean \bar{x} being used to estimate the population mean). On the assumptions made about the damage per unit area inundated, the value of crops lost per year is Rs.82 million.

The life of the project was assumed to be one hundred years, which is generally used for the evaluation of similar projects in India. The present value of an annuity of Rs.82 million per year for a hundred years at a 10 per cent rate of discount is Rs.820 million approximately.¹ This can be regarded as an estimate of the damage to agricultural production due to floods in the Damodar Valley.

Apart from the damage to agricultural output, damage to property such as railway lines or roads on the left bank of the Damodar River may also occur if the peak flow is sufficiently high. The expected level of such damage can then be computed from our estimated probability distribution together with the relevant damage function. Similar considerations apply to the damage due to loss of life, although special difficulties are involved in evaluating such damage.

The Damodar Valley Project cannot at present provide for complete flood protection. Hence, to compute the benefits of the extent of flood protection achieved by the project, one could follow the method indicated in section 10.4 by estimating the functions $f(x)$ representing the reservoir operation policies in various ranges of values of x . The benefits so computed could then be compared with the relevant costs.

A Summary

We shall conclude by pointing out some of the more important limitations of the method of evaluating flood-control benefits described in this chapter.

Firstly, the estimation of the flood-damage function involves a number of serious difficulties. Thus, the relationship between flood discharge and area inundated in this region is likely to show an upward shift over time owing to the building of new structures and the silting of the river bed in the lower valley. This has in fact been happening in the deltaic regions of West Bengal, with the result that a peak flow of a given intensity now tends to produce a greater extent of inundation than in the past.

Again, the damage per unit area inundated tends to increase over time because of economic development. To the extent that such an increase in the damage factor is due to autonomous economic development, the estimation procedure may be corrected by appropriate statistical analysis (e.g. by taking trend factors into¹ within the normal range of rates of discount it actually makes very little difference whether the lifetime used is 100 years or 150 years or infinity. 10 per cent has been widely used as an accounting rate

of discount in public-sector projects in India. However, this rate is used here merely to illustrate the method. The question of the appropriate social rate of discount has been discussed in Chapter 6 above account). On the other hand, economic development may result from the flood-control project itself. In this case, there are considerable conceptual difficulties in evaluating project benefits. These are connected with the question: do flood-control schemes lead to 'over-development' in the flood basin? Such a question cannot easily be answered within the framework of cost-benefit analysis itself (but see Renshaw [4]).

Secondly, this exercise has been confined to the flood-control component of the D.V.C project; for this purpose, we took the allocation of storage capacity between different objectives, e.g. flood control, irrigation and power, as given. This means in effect that we accepted without question the constraints imposed on the system, viz., certain minimum levels of power, flood-control storage and so on. On the other hand, one of the aims of cost-benefit analysis of multi-purpose river-valley projects should be to examine the opportunity costs of varying the levels of different constraints. This can provide means of estimating the trade-offs between different objectives. However, the method described for estimating the benefits of flood control may itself be regarded as a first step towards making such comparisons possible. Thirdly, no attempt was made to estimate the 'secondary' benefits of flood control.

Finally, it must be stressed once more than the statistical calculations provided in this chapter must be regarded as illustrative and preliminary rather than as providing a blueprint for the project in question.

B u d g e t

- A. Performance Budgeting
- B. Zero Base Budgeting
- C. Cost - Benefit Analysis

[READING MATERIAL]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Reading material

Performance Budgeting

1. Definitions:

- 1.1. It is an input-activity-output analysis.

2. Goal:

- 2.1. The goal of performance budgeting is to establish the relationship between financial input and physical output, both tangible and intangible in accountable terms with scope for proper performance measurement to strengthen the accountability systems and to present the same to representatives of people for discussion and voting during the budget session.

3. Objectives:

- ➔ To adopt concepts of economy and efficiency
- ➔ To plan and budget with the mission of customers satisfaction
- ➔ To set targets under each variable by following the principles of operationality and attainability.
- ➔ To measure the performance, both tangible and intangible
- ➔ To match responsibility, authority and accountability
- ➔ To serve the purpose of systematic monitoring and evaluation
- ➔ To enable internal customers and supervisory level staff to undertake performance inspection
- ➔ To enable external evaluating agencies to conduct performance audit.
- ➔ To develop an activity oriented system to fill the gap between benchmark and defined standards in terms of quantity, quality and time.
- ➔ To present performance results to board level or to the representatives of the people, as the case may be.

➔ To enable the appropriate level of management to bring about corrections in the system to consolidate the existing position and to think of further refinement.

- 3.1 At the macro level, the Head of the department must consolidate the performance budget prepared for different responsibility centers. To begin with, the mission of the organisation must be effectively marketed at all internal managerial levels. A business survey should be conducted within the policy frame of the government. If required, when conducting the business survey, external customers may be involved along with other departments and organisations to the extent that co-ordination is required from them.
- 3.2 The task of business survey is both internal and external. The objective of internal survey is to collect important data, followed with information. For example, details regarding the budget for the ensuing year, current year with revision, if any, and actuals of the previous three years. This entails a study of the Annual administrative reports, Inspection Reports, Audit Reports, Financial and appropriation accounts of previous three years.
- 3.3 In the external survey, the needs of the external customers must be identified with proper methods and strategies, and if possible, with proper evidence. This will enable the Head of Department and the managerial level at different centres to match the response level of internal staff to the needs of the different stake holders, including the final customers. This will also enable the internal staff to identify benchmarks under different variables and to enable them to redefine or to refix the standards in terms quantity, quality and time. In other words the objective of business survey is to ascertain the gap between, what it is and what ought to be. Once the gap is identified the task of the internal staff is to identify what is possible and what is not possible to fill the gap. It can also enable the internal staff to draw out strategies and methods that need to be adopted in order to fulfill the gaps in phased or consolidated manner. The pre-requisite for this kind of an exercise is that the constraints must be identified, by doing the SWOT analysis.
- 3.4 After the business survey is over, the next task is that the HOD lists out the responsibility centers at macro level by involving the internal staff at different managerial levels. This must be done with precision and accuracy for each responsibility center, area-wise. For example “Compulsory Primary Education” is one of the responsibility centers in the Education Department. Under this, there are a number of schools, number of teachers, number of students in different districts, blocks, villages through out the state. Therefore, listing out the name of each school with address, names of teachers, numbers of students enrolled is essential at the micro-level. Performance Budgeting must be prepared for

each primary school. A state wide consolidation of Performance Budgeting must be undertaken for all the primary schools. Only then will Performance Budgeting for “Compulsory Primary Education” be ready for presentation at the macro level. Similar exercises must be undertaken for all responsibility centers at the micro and macro level to make a Performance Budget for the entire department. Such a document must be placed before the Legislature for discussion and voting. Along with this document, both internal and external evaluation reports for the previous year should also be placed before the Legislature.

- 3.5 The concept of Performance Budgeting is based on the principles of “Investment Justification”. Performance cannot merely be measured in terms of money spent. In Performance Budgeting the financial input must be related to the physical output, whether tangible or intangible. The estimated relation between the input and the output should be scrupulously monitored by the head of each responsibility center, during the implementation process. The consolidated outcomes of the evaluation, with reasons for short performance or non-performance or bad performance, as the case may be, should be invariably placed before the different stake holders, internal and external, to take further action, including corrections, refinement, accountability etc.

4. **Group Work:**

- 4.1. Prepare the Performance Budget for a responsibility center using the check list given below; presuming that, at this stage the task of business survey is completed.

Check List to prepare PB for ‘Responsibility Center ’

1. Title:

PB of the ----- (Project/Office/Scheme etc.) coming under the ----- (Organization/Department) for the financial year -----
--

2. Aim

Write down the aims of the responsibility center within the policy frame of National or State level.
--

3. Objectives

Write down the number of objectives on priority basis. Again under each objective list the variables.

4. Targets

Under each variable spell out the targets.

If the targets are intangible (not measurable), mention the targets in terms of positive statement. If possible, incorporate the figures for 3 years. That means, there must be 5 columns i.e., first three columns for the previous three years, the 4th column for the current year with two sub columns covering both the original and revised targets, and the 5th column for the ensuing year.

5. Budget

List out budgetary details separately for manpower budget and the details of non-salary budget, both under plan and non-plan. The details of capital outlays and loans, if any, shall also be mentioned. It shall contain the column wise details for the previous three years, current year budget with the sub columns for original and revised estimates and the estimates for the next year. The detailed head wise, i.e., objective classification shall be mentioned.

6. Organisation Chart

Mention the details of organization right from the Head of the responsibility Center with cadre wise strength. Also, mention the job chart of the staff, with the details of authority and responsibility. Under the job chart list out the events and list out the activities under each event. For each activity, prepare a checklist.

7. Infrastructure Facility

The existing strength of the department in terms of buildings, machines, furniture and other equipment etc., with the details of there condition shall be mentioned.

8. Constraints

The specific constraints experienced in the past three years and the anticipated constraints and limitations shall be mentioned. For example, the work load, lack of equipment, support, lack of training to operate new machinery, etc.

9. Co-Ordination

The expected level and areas of co-ordination with other organisations shall be mentioned here.

10. Designing a Responsibility Center

- 10.1 For each responsibility center, determine the exact or appropriate funding required achieving the objectives.
- 10.2 Under each objective determine the number of variables in order of priority in terms of quantity and quality
- 10.3 Under each variable indicate the achievable targets in terms of quantity, quality and time standards. . If necessary, indicate a phasing out of such targets, if required on a monthly, quarterly, half yearly or an annual basis. Where it is not possible to explain the targets in measurable terms, indicate the same in the form of statements. Under each variable, ensure that you:
 - Briefly explain the variations under each variable between the bench mark and the proposed standards
 - List out the activities to be undertaken to fill the gap between the bench mark and proposed standards.
 - Mention implementation methods and strategies preferably in terms of time standards with expenditure plan
 - Develop unit cost under each variable by following the techniques of least cost methods.
 - In case of taking project as responsibility center adopt the network techniques.
 - Develop methods to measure the periodical performance under each variable coming under each objective. For this purpose establish an internal monitoring system, which clarifies:
 - who has to measure what
 - at what periodicity should it be measured
 - under which variable should it be measured
 - which yard stick should be chosen for measuring the variable
 - to whom should a report with periodical results be submitted
 - what action should be taken by the person who receives the periodical reports.

In other words MIS shall be adopted.

- ⇒ Consolidate the finance, activity and targets under each objective to get the total figures.
- ⇒ Develop a system of documentation of performance
- ⇒ Develop a system of external evaluations to measure the performance.

Note: The design in terms of format and columns may vary from responsibility center to responsibility center. For this purpose HOD has to involve the Heads of responsibility center in order to evolve a common format for responsibility center.

11. AT HoD Level

- a. Performance Budgeting of each common responsibility center must be consolidated at the HoD level. At this stage PB will be ready for the entire department. At HoD level the financial figures related to non-responsibility centers (Supervisory level) should be mentioned separately and the same may be treated as overhead costs.
- b. At this stage the Performance Budget document for the entire department will be ready for presentation and discussion by different stakeholders.

ZERO BASE BUDGETING

1. Meaning :

Zero base budgeting means starting from zero: it means viewing the funding/ budgeting required for an entire scheme or a programme or an item of a scheme or programme afresh.

- 1.3 In the case of a proposal involving fresh expenditure, zero base budgeting enables the planner to examine its necessity from various angles with a view to taking a final decision for approving or rejecting the same.
- 1.2 In the case of 'on-going expenditure' zero base budgeting helps examine the necessity of continuance of that expenditure from various angles with a view to enabling planners to take final decisions on whether to continue or stop that expenditure.
- 1.3 In the case of recurring expenditure, zero base budgeting help view every item of the recurring costs afresh in order to help planners decide as to whether to allow the recurrence of the expenditure or to stop it.
- 1.4 If the initial examination indicates that the existing level of expenditure of any item is inevitable, zero base budgeting will help question the incremental expenditure of that item.

2. Methodology:

To prepare Zero Base Budgeting, it is necessary to follow the steps given below:

- Identify and list the decision units
- Breakdown the decision units into a number of specific decision packages
- Design each decision package
- Evaluate each decision package
- Prioritise the decision package based on evaluation

- Allocate funds to each decision package

3. Decision Units:

- 3.1 In every organization there are several decision taking levels. A decision unit is the same as a decision level. It is necessary identify and list out the Decision Levels/Units in every organization. Decision levels/ units may be identified area-wise or subject-wise, or both area- and subject-wise.
- 3.2 A decision unit should not be too small or too big in size. It must be of a meaningful size, so that cost performance ratio (financial input and output ratio) is convincing. If the decision unit is too small, the overhead costs may be highly disproportionate to the performance. If the decision unit is too big, the quality of monitoring of performance may suffer. Therefore, it may be necessary to bring about structural re-organization in a department in order to provide for an optimum decision unit from the point of view of economy and effective monitoring.
- 3.3 In a Department, a decision unit may be at various levels: at the level of the Head of the Department itself, or at the division level, or at the District or Taluk or Hobli or Panchayat or Municipal level. Sometimes, there may be autonomous bodies under the control of a Department. Such autonomous bodies may be taken as separate decision units.
- 3.4 The objective of proper classification and size of the decision units are to:
 - ? Define or redefine authority and responsibility
 - ? Provide effective internal co-ordination
 - ? Carry out analytical studies, e.g. work load study; resource-performance ratio study; machinery-performance ratio study, etc.
 - ? Identify redundant expenditure
 - ? Remove duplication of expenditure
 - ? Re-deploy surplus resources
 - ? Resize tasks with reference to local needs; etc.,

4. Listing Decision Packages Under Each Decision Unit

- 4.1 Under each decision unit, there may be a number of decision packages either in the form of subjects or projects.
- 4.2 Each subject or project would have a unique title. For example, assume that the Deputy Director of AH&VS of a District is a decision unit. Under this decision unit there may be the following decision packages:
 - Sheep rearing

- Poultry farming
- Artificial insemination centre
- F & M vaccine centre
- Pets health care; etc.

5. Design of decision package

This is a very important part of ZBB. Each decision package must be designed comprehensively to justify the quantum of financial investment. The format to design a decision package is given below:

- Name of decision package with details of its identification with location.
- Major head of account
- Duration of implementation of the package
- List of functions
- Specific objectives under each function
- Targets or events to be achieved under each objective with deadlines
- Activities to reach target or to accomplish each event.
- List of direct and indirect benefits on reaching target or on accomplishing of each event.
- Relevance of each activity in the present context or with reference to the needs of the people.
- Explanation regarding consequence if event/target/activity is not funded
- Indication of norms of performance or prescribing performance standards under each indicator
- Funding levels in decision package and how and to what extent each level should be funded
- Estimated cost under each detailed head of account or item-wise.
- Phasing of proposed expenditure.
- Listing alternative methods with cost to achieve prescribed targets or to accomplish each event
- Series of relevant questions with answers to justify every proposed item of expenditure in the decision package. A suggestive list of relevant questions is given in the box below:

Questions:

- What is the necessity of the decision package?
- What will be the consequences if the decision package is not implemented?
- What will be the tangible and intangible benefits if the decision package is implemented?
- Make a social cost-benefit analysis of the decision package

- Are there any other similar/ duplicate activities?
- What co-ordination mechanisms have been proposed for cost reduction?
- Why has the proposed implementation method been chosen?

6. Evaluating the Decision Package

- 6.1 Each item of expenditure has to be examined rigorously in order to effect reduction in the proposed cost and to increase the returns or benefits from the implementation of the decision package. It is particularly crucial to identify and eliminate the overhead costs and duplication of expenses.
- 6.2 Evaluation must take cognizance of the needs of the people - from the point of view of prioritization of Decision Packages and from the point of view of allocation of resources.

7. Ranking Of Decision Packages

- 7.1 The evaluated Decision Packages must be ranked based on the needs of the people and on the Policy of the Government. Decision Packages with higher rankings must be funded on a priority basis. Decision Packages which are lower in ranking and cannot be funded on account of resource constraints have to be deferred.

COST BENEFIT ANALYSIS

Cost-benefit analysis is based on welfare theories developed by various economists. Here we will not be dwelling on the historical development of the welfare concept. Our focus will be on undertaking Cost Benefit Analysis with reference to a given project.

A given project will have a definite area and definite customers. In theory, before launching a project the following points must be considered:-

- The individual preference with reference to a need or quantum of need must be identified and such individual needs converted into social preferences or social needs. This will be the basis of identification of social weightages with reference to the proposed projects.
- A system must be developed to make out or to identify social preferences.
- The likely direct and indirect benefits from a project must be estimated and the beneficiaries identified. To what extent these beneficiaries utilise these direct/indirect benefits and to what extent these beneficiaries will pay towards it must be ascertained.
- The capacity and willingness to pay, and the quantum of payment must be estimated. To analyze the willingness to pay, consumer surplus must be worked out, i.e., the relationship between market prices and willingness to pay.
- In case of some projects, a situation may arise that the people who are not likely to get any benefits, may also have to share the expenses of social projects. If so, the extent of their share must be estimated. In developing countries from the point of balanced regional growth or from the angle of socio-economic justice, this kind of approach may be inevitable.
- Regarding the sharing of expenses, the other situation may also arise, where the present generation may have to incur the burden of expenses on a project for the benefit of the future generation. Conversely, the present generation may implement a project, get its benefits, and pass on the liability to the next generation.
- The direct loss and indirect loss to society must be analyzed
- The direct cost and indirect cost of the proposed project must be analyzed.
- Changes in distribution of benefits from a project should be measured.

- Compensation policies.
- Economic growth centers.
- Prioritization of projects and prioritization of objectives in a given project must be based on the principles of consumer sovereignty.

Shadow Price

(Also known as Accounting Price or Social Price)

(Definition from the Book 'Pocket Economist' by Prof. Matthew Bishop)

- 1.1 Shadow price is the true economic price of an activity: the Opportunity Cost. Shadow Price can be calculated for those goods and services that do not have market price, perhaps because they are set by government. Shadow pricing is often used in Cost Benefit Analysis, where the whole purpose of the analysis is to capture all the variables involved in the decision, not merely those for which market prices exist.
- 1.2 Speaking in simple terms, every input, activity and output is measured in terms of price. In commercial projects market-price is used as the yardstick to measure inputs and outputs. But in case of social projects this is not possible. Opportunity cost may also be taken as shadow price. The unit cost are determined on the basis of the inputs of a project. The subsidies allowed, if any, are to be ignored, while calculating the unit cost. The unit cost is also taken as base to measure the unit of goods or services provided to a customer, again by ignoring the subsidies. This means that subsidies, if any, at cost point or at providing point have to be eliminated to calculate shadow price.

2. External Effects:-

- 2.1 The externality effect exists when a:
 - Production affects another production
 - Consumption affects another consumption
 - Production affects another consumption
 - Consumption affects another consumption
- 2.2 The effect of each of these may be either negative or positive. If the effect is negative, the sufferer has to be compensated. If it is positive, the person who has gained must pay for it. The effects are analyzed from the point of view of (i) input-generated effects and (ii) output-generated effects.

Production also affects the consumer. Here too, the effect may be positive or negative. If the effect is positive, the consumer must pay for it. If it is negative, the consumer has to be compensated.

External effects are often attributed to technological advances. In addition, government assistance, including subsidies also have an external impact.

3. Social Rate of Discount

- 3.1 Social time preference is based upon the assumption that (i) society always prefers the present to the future, and (ii) the next generation will have higher consumption levels. It is not possible to estimate the preferences of the generation. However, the benefits to be derived by future generations must be greater than the cost of sacrifice of the present generation. The time gap between these is taken as base for discounting procedure.
- 3.2 The unsubsidized interest rate as the cost of sacrifice by the present generation may be taken as discount factor to calculate the present value of the estimated returns to be received by the present generation and as well as by future generation. Such discount factor will be the social rate of discount.
- 3.3 To make a choice between alternate projects the necessary condition is that discounted benefits should exceed discounted costs. In other words $NPV > 0$.
- 3.4 The Social Rate of Discount is taken as base to calculate the present value of benefits and costs. While selecting a project on the basis of NPV indicator, risk and uncertainty analysis must be undertaken. The major problem is non-availability of exact/reliable data. The expected utilities and the probabilities are the major factors of uncertainty. The driving forces, sustaining forces, restricting forces shall be measured especially under the key indicators. Too much of pessimistic or too much optimistic estimations not to be considered. The calculations based on weighted average or standard deviations may be more appropriate. In reality, it is always safer to prepare for the marginal variations i.e., regarding the difference between the actuals and estimations.

B u d g e t

A. Performance Budgeting

B. Zero Base Budgeting

C. Cost - Benefit Analysis

[Instructions to Faculty]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

A. Performance Budgeting

1. Objectives:

At the end of this learning unit, the participants will be able to

- Understand the meaning, concept and framework of performance budgeting.
- Design responsibility centers by linking financial inputs to outputs.

To achieve the above objectives it is necessary to impart training in the conceptual framework of performance budgeting and the methodology to design responsibility centers.

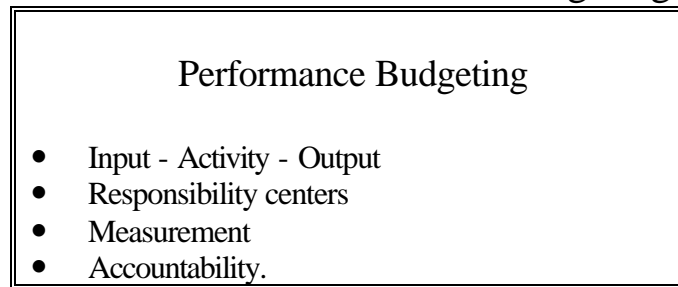
2. Instructions to Faculty:

2.1 Make a presentation covering the following content areas:

- ❖ Explain and define Performance Budgeting
- ❖ Explain the following points
 - Historical development of Performance Budgeting.
 - Line item budget
 - Definition and meaning of responsibility centers
- ❖ Programme/Activity classifications
- ❖ Norms, yardsticks and standards to measure performance
- ❖ Accounting classification
- ❖ Decentralized responsibility structure
- ❖ Reporting and review of performance
- ❖ Designing responsibility centers.

2.2 Faculty may use the material in visual aids Nos. 20 and 21 in order to make the said presentation.

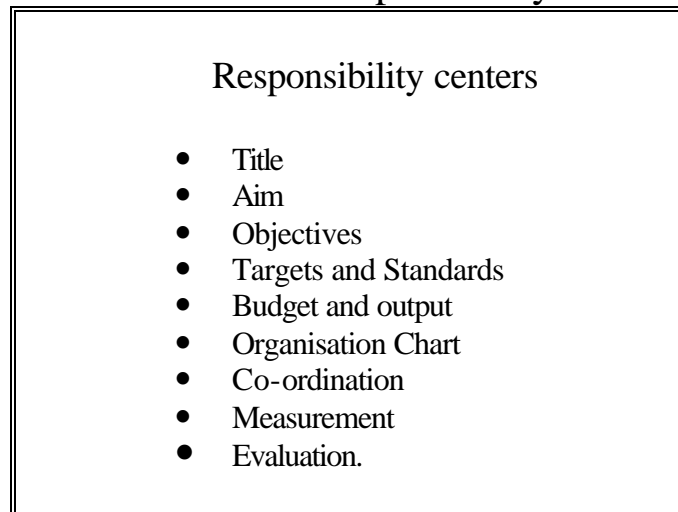
Visual Aid - 20: Performance Budgeting



2.3 Faculty to explain:

- Historical background of performance budgeting and its definition
- Advantages of performance budgeting
- Systems improvement that can be effected by adopting performance budgeting
- Applications in practical situations
- Concepts relating to measurement and accountability.

Visual Aid - 21: Responsibility Centers



Faculty should explain the theoretical framework of designing responsibility centers as explained in reading material.

2.5 This will be followed by activity described for Group 1 in the section on Group Activities for Learning Unit 3. Group activities should be carried out in accordance with the given instructions.

B. Zero Bases Budgeting Methodology

1. Objectives:

At the end of this learning Unit the participants will be able to -

- List the steps to be followed to prepare Zero Base Budgeting.
- Identify decision units and decision packages
- Identify and remove redundant expenditure
- Rationalize expenditure by removing duplicating expenditure
- Design decision packages
- Re-examine the necessity of continuance of on-going expenditure
- Determine different levels of funding
- Use ranking methods for prioritization of decision packages

Following are the sub units of the Learning Unit 5 to achieve the above objectives.

Sl.No.	Name of the Sub Unit
01.	Meaning and historical background of Zero Base Budgeting
02.	Zero Base Budgeting framework of methodology
03.	Determining of the Decision unit level
04.	Designing of decision packages
05.	Different levels of funding
06.	Ranking of decision packages

2. Instructions to Faculty:

- 2.1 Make a brief presentation to explain the meaning of Zero base Budgeting and its historical background. Give instances of successful applications, as also failures in obtaining results in India and abroad.
- 2.2 Ask each participant to identify a decision unit and the hierarchy of decision units in respect of their own organization. Participants could be given five minutes time to jot down points in their own notebooks, which could be consolidated in plenary. During consolidation explain the importance of determining the right size of a decision unit.
- 2.3 Involve participants in the identification of the following with reference to his/her own organization. The faculty may trigger off reflection and analysis among the participants by giving an example, and then inviting participants to give examples from their own experience.

❖ Redundant items of expenditure

- ❖ Duplication or multiplication of expenditure
- ❖ Alternative methods to achieve the same objective in the most economical manner.
- ❖ How saved resources can be redeployed
- ❖ List of the powers, responsibilities, and tasks assigned to each decision unit level in the organization.
- ❖ Examples of decision packages

2.4 Give each group of participants the following exercise, namely, design a decision package by incorporating all the essential factors, including:

- ➔ Description of the function or activity.
- ➔ Goals and objectives under each function or activity.
- ➔ Benefit, if the activity is financial.
- ➔ Relevance of activity.
- ➔ Consequences of not funding the activity
- ➔ Estimated cost
- ➔ Phasing of cost
- ➔ Alternative ways to achieve the same objectives.

2.5 Faculty will act as facilitator to each group, to clarify doubts during group discussion. Each group will design the decision package using visual aids.

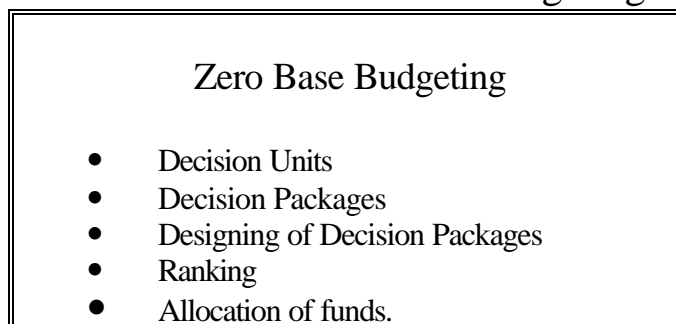
2.6 Faculty will explain how relevant questions can be framed for expenditure on on-going schemes or new items of expenditure.

2.7 Faculty should explain to the individual groups how to draft objectives for decision packages, such that the objectives are sharp and specific.

2.8 All exercises should preferably be done in class or at an easily accessible location so that the faculty can periodically and frequently interact with the participants during their discussions.

2.9 Faculty may use the visual aids Nos. 22 and 23 for making the presentations:

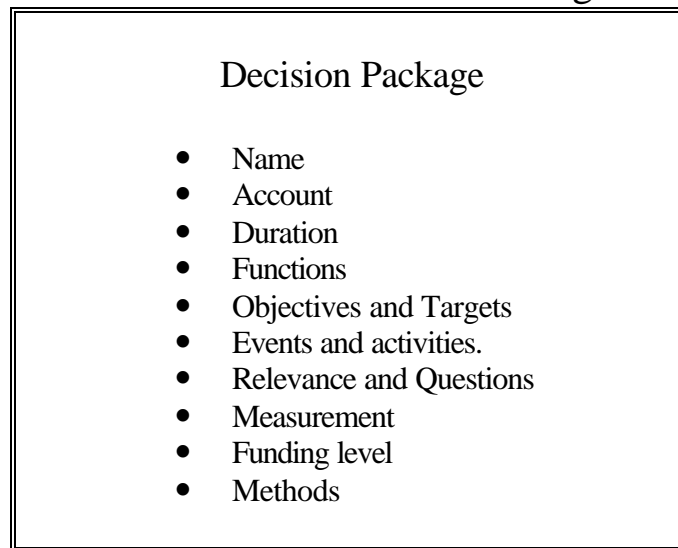
Visual Aid - 22: Zero Base Budgeting



2.10 With reference to the visual aid faculty may explain the:

- Meaning of Zero Base Budgeting and its historical background
- Scope of application
- Methodology for preparation of Zero Base Budgeting
- Identification and elimination of duplicate/multiple items of expenditure
- Alternative strategies for cost reduction.
- Examples of successful applications, as well as failures.

Visual Aid - 23: Decision Package



2.11 Faculty to explain the designing of decision package with reference to the reading materials.

2.12 This will be followed by activity described for Group 2 in the section of Group Activities in Learning Unit 3.

3. Cost Benefit Analysis

3.1 At the end of this learning unit, the participants will be able to:

- Identify and value the items of costs and benefits.
- Undertake compensation analysis
- Comprehensively use the Externalities Theory in respect of social goods.
- Identify and use Social Rate of Discount for cost benefit analysis.
- Undertake Risk and Uncertainty Analysis for decisions relating to social policy.
- Do cost-benefit analysis with reference to given cases.

- 3.2 In order to achieve the above objectives, it is necessary to impart training on the following sub-units:

Sl. No.	Name of the Sub Unit
1.	Utility cost and benefits.
2.	Compensation theory
3.	Social Rate of Discount
4.	Externalities

4. Instructions to faculty:

Make a presentation covering the following content areas:

- ❖ Objective functions in cost benefit analysis.
- ❖ Social preferences as objective functions.
- ❖ Preference and utility.
- ❖ Valuation of benefits.
- ❖ Valuation of costs.
- ❖ Compensation theory.
- ❖ Distribution of Income and 'Equity'.
- ❖ Meaning and use of Social Rate of Discount.
- ❖ Defining externalities.
- ❖ Technological externalities.
- ❖ Externalities and future generations.
- ❖ Social time preference.

- 4.1 Faculty may use the points given in visual aid 24 in order to make their presentations.

Visual Aid - 24: Cost – Benefit Analysis

<p style="text-align: center;">Cost - benefit analysis</p> <ul style="list-style-type: none">• Why ?• Social preferences• Utility and welfare• Compensation• Externalities• Social rate of discount• Valuation• Case Studies.
--

- 4.2 Faculty should explain individual points as per reading materials in Learning Unit 3. In addition faculty may explain with calculations (i) Weighted average, (ii) Standard deviation.

This will be followed by activities described for groups 3 and 4 analyzing case studies, entitled and 'Damodar Valley Flood Control Scheme'. The case studies are drawn from the book, entitled 'Cost Benefit analysis: theory and practice' by Ajit K. Dasgupta and D.W. Pearce. Faculty should explain how to analyze the negative and positive effects of the case studies under the different indicators of social cost benefit analysis.

CAPITAL MANAGEMENT

[Group Activities]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Capital Management

1. Group Activities

- 1.1 Before the commencement of group activities, faculty will make a comprehensive presentation on the various aspects of Capital Management and the topics assigned for group activities.
- 1.2 Activities will be conducted in three groups. Each group will be assigned tasks in two sub-units.

Group 1: A. Capital structure.
 B. Capital budgeting decisions.

Group 2: C. Measurement of risk.
 D. Cost of capital including CAP-M

Group 3: E. Valuation of fixed income securities.
 F. Valuation of bonds and stocks.
- 1.3 Based on books borrowed from the library and the reading materials circulated, participants will be involved in group discussion for
 - ↗ Conceptual clarity on issues relating to capital management
 - ↗ Meaning of specific words relating to capital management
 - ↗ Utility or scope for applications.
 - ↗ Illustrations or examples of capital management.
- 1.4 During group discussion, group must be guided by the questions given in the box below. The questions are framed with a view to facilitating conceptual clarity. Information given in the reading material will provide sufficient clues to the solutions.
- 1.5 After group discussion, one or two persons from the group will make a presentation using visual aids. Presentations will be further strengthened with plenary discussions, moderation and listing of learning units.

Guiding Questions:

1. Generally individuals show a time preference for money? Give reasons.
2. Why is the consideration of time important in financial decision making ?
3. Explain the mechanics of calculating the present value of cash flows.
4. Explain the concept of valuation of securities.
5. What is the difference between the valuation of bond and of a preference share?
6. Why are dividends important in determining the present value of a share?
7. What is the difference between the expected and the required rates of return in context of common share?
8. What is capital budgeting? Why is it significant for a firm?
9. What are the reasons for the popularity of the payback period method, despite its weaknesses?
10. How do you calculate the ARR? What are its limitations?
11. What is meant by the term value of money? Which capital budgeting methods takes into consideration about this concept? How is it possible for the capital budgeting methods that do not consider the time value of money to lead to wrong capital budgeting decisions?
12. Distinguish between profits and cash flows? Why are cash flows important in investment decisions?
13. What are incremental cash flows? Briefly explain effects of the following on the calculation of incremental cash flows.

- (a) Sunk costs.
- (b) Allocation overheads and
- (c) Opportunity costs.

14. How should depreciation be treated in capital budgeting? Do the depreciation methods affect cash flows differently? How?
15. Explain the significance of cost of capital in financial decision making
16. How is the cost of debt computed? How does it differ from the cost of preference capital?
17. The equity capital is 'cost free'. Do you agree? Give reasons
18. How is the weighted average cost of capital calculated? What weights should be used in its calculation?
19. The chairman of a rubber company stated "we don't adjust our capital budgeting calculations for inflation because the price and costs of the product increase by the same rate" Comment
20. Explain the concept of risk? How can risk be measured?
21. What is sensitivity analysis? What are its advantages and limitations?
22. What is financial risk? How does it differ from business risk? How does the use of financial leverage result in increased financial risk?
23. Explain the assumptions and implications of the net income approach and net operating income approach.
24. Define capital structure. What do you mean by an appropriate capital structure? What should generally be the features of an appropriate capital structure?

CAPITAL MANAGEMENT

[READING MATERIAL]

Administrative Training Institute
Lalithamahar Road, Mysore - 570 011

Capital Management

Capital Structure

(Extract from the book 'Financial Management' by Prof. I.M. Pandey)

1. Capital:

- 1.1 Capital is made up of debt and equity. Debt is borrowed money, for example money borrowed from financial institutions, etc. Equity is shareholders' money called equity capital. Capital is required either for new business or to expand the existing business. Capital comes from different sources.
- 1.2 The debt holders do not have a share in the profit. They can only ask for return of money borrowed with interest. Their claim is limited to fixed return.
- 1.3 As debt rises, capital rises; consequently interest rates rise and risks will also rise.
- 1.4 The capital must be a right mix of debt and equity. This is called capital structure. The capital structure affects stock prices and the cost of capital.
- 1.5 The inherent risk associated with operation of an organization is called business risk. A firm will normally project its future returns on invested capital. Uncertainties on such projections are a business risk.
- 1.6 If a firm's capital is only from the source of equity and not from the source of debt, its interest payments will be zero. In such situations return on invested capital will be equal to return on equity. RoE stands for 'Return on Equity'.
- 1.7 The fluctuations in RoE may depend on factors like, booms, recessions, new products, competitor's strikes, fire etc. These factors may recur in future also. These uncertainties are business risks. The stock holders have to bear the business risks.
- 1.8 The other important factors on which the business risks depend are:
 - Elasticity of demand for a firm's products. If the demand is stable, the business risk will be lower.
 - The variations in sales price
 - Fluctuating input costs and skills to hold output prices successfully in the market.

- Capital to stand in the market in the long-run inspite of rising input cost and lowering sales price.
 - Switching over to new products or old product with new design or with new name or new packing etc. in a shorter span of time.
 - The new cost-effective production ideas.
 - In case of foreign trade activities the earnings may vary due to fluctuations in exchange rates.
 - The effect of operating leverage, i.e. fall in demand for product without fall in its high fixed cost.
- 1.9 The fixed costs normally do not fluctuate. Therefore a small fall in sales may lead to a larger fall in RoE. In other words, business risk will be higher, if the fixed costs are high. The higher the degree of operating leverages, the higher the business risk.
- 1.10 Technological innovations are utilized to reduce larger investments in fixed assets. Failure to make technological adaptations can result in collapse and closure of the company, as in the case of Yezdi in Mysore.
- 1.11 Capital budgeting decision is based upon the initial investment and its operational or utility cost, and not just on the initial investment alone. Therefore, some of the higher fixed costs may lead to lower variable costs i.e. the lower operational or utility costs.
- 1.12 Each project will have different degrees of operating leverage. Different methodologies will have different degrees of operating leverage even for the same result in a given project. Therefore, the concept of operating leverage is useful for project choice or for selection of an appropriate method out of many alternative methods.

2. Financial Leverage

- 2.1 A firm may finance a new plant or expand an existing plant through debt (also called as financial leverage) or through equity.
- 2.2 If financed through debt, the business risk would concentrate on the existing common stock holders because the debt holders would get fixed interest payments; the debt holder therefore do not bear the business risk. In other words, using financial leverage in the form of debt finance shall place the business risk totally on the common stockholder.
- 2.3 In case of financing through both the sources, namely debt and equity, the capital budgeting decision shall focus on Appropriate Ratio. The higher the debt (financial leverage) and lower the equity, the higher the business risk on the old stock investors plus on the new stock investors.

- 2.4 The lower the debt (financial leverage) and the higher the equity, the lower the business risk on the part of stock investors (old + new), but the stock holder may end up with lower percentage of dividend per share.
- 2.5 With a rise in debt capital and corresponding rise in returns, the earnings per share will go up. But the question is whether in this situation, a firm will enhance debt financing. Why not? The point is that the quantum of benefits arising out of debt investment (financial leverage) must offset the business risk of equity investors.
- 2.6 To conclude, the management must plan to find out the lowest investment on fixed assets with lowest operational or utility cost.
- 2.7 If the management aims at increasing debt finance, it must see that the business risk on equity holders is offset by returns on debt.

3. Capital Structure Theory

- 3.1 The use of financial leverage increases the expectations of stockholders along with the rise in the business risk. This means that the returns and the risk vary directly. The stockholders sometimes expect more returns, when compared to the unit of risk. They may not just accept corresponding compensation. The 'Capital Structure Theory' may help us with an analysis in this direction.
- 3.2 Prof. Franco Modigliani and Merton Miller developed modern capital structure theory. They made the assumption that a firm's value will not be affected by its capital structure that is debt versus equity. In other words, they believed that capital structure is irrelevant. The Modigliani- Miller (MM) theory was also based on the assumption of Zero taxes. The Zero Taxes effect means that the return derived out of use of financial leverage will exactly offset the increase in risk. In other words, the MM theory believes in the proportionality of returns to risk. That means net benefit is zero. But in reality such net benefit of using financial leverage may be positive or negative.
- 3.3 The MM theory advanced further by removing the assumption of Zero corporate taxes. While paying corporate taxes, the amount paid towards interest shall be deducted. Dividends paid to stock holders are not deductible from the amount payable as corporate tax. The benefit of deduction of interest on debt out of corporate tax works out as positive point to use debt. Prof. Merton Miller made further improvements to this theory, by incorporating personal taxes. Prof. Merton Miller observed that interest will be in form of income on bond, and dividend will not be in the form of income on shares. This income is liable for personal tax. Capital gains will be realized only after the stock is sold. The rate of personal tax on return on share will always be less than the return on bonds. This is a favorable factor to use equity finance. It is clearly visible that MM theory considered both corporate tax and personal tax to analyze the capital structure, i.e., how deduction of interest from corporate tax encourages debt financing and the situation of lesser tax on returns on shares when compared to

the tax on return on bonds encourages the finance through equity. Finally, the relative effect of both may decide the portion of debt finance and equity finance in the capital structure.

- 3.4 The shareholder may also get the return on Capital. Until the stock is sold, there will be no capital gain and there will be no capital gains tax. The rate of capital gains tax is always lower. This factor will have supportive effect to equity finance.

4. Bankruptcy Costs:

- 4.1 The MM theory assumes the bankruptcy cost as Zero. A firm heading for bankruptcy has to suffer from a chain of negative problems like, selling assets at low price, difficulty in retaining customers, credit refusal, threat of move out by key players etc. These problems may result in high legal and accounting expenses. Mere foreseeing the threat of bankruptcy is sufficient for a firm to avoid using financial leverage (debt finance) to excessive levels. When the return to a firm is highly fluctuating, it always faces a threat of bankruptcy. Such firms shall opt for lower debt finance (financial leverage).
- 4.2 When facing high costs or financial distress, firms must reduce the use of debt finance (financial leverage)

5. Trade-Off

- 5.1 Selling in advance, the anticipated benefits of debt financing against the possible threat of higher interest rate and bankruptcy costs is the 'trade-off theory'. The interest paid on debt finance is eligible for deduction benefit under corporate tax. This benefit will raise the using of debt, which in turn, there will be rise in EBIT and rise in the value of stock price [EBIT stands for earning before income tax or operating income]. In MM theory this will be called as 'effects of corporation taxation'. In spite of favorable situation for the use of debt finance, still a firm may not opt to use 100% debt, because of lesser I.T. on income out of stock, threat of financial distress and the situation of higher the interests for the higher debt.
- 5.2 The major problems a firm may face is that the tax benefits derived on debt financing will be reduced or taken away by the bankruptcy related costs and rising interest rate. Here the bankruptcy related costs' means the cost entering into the situation of probable bankruptcy in terms of prevention.
- 5.3 If a firm raises its use of debt, the weighted average cost of capital initially decreases and then begins to rise after reaching the minimum.

6. Signaling Theory

- 6.1 The company's managers will have better information when compared to the investors, regarding the prospectus of a given company. But the MM theory assumes, both will have the same information.
- 6.2 In a situation where a company had invented a new variety of product, it is better opt for debt finance rather than equity finance. This may be because, if funded through equity, the new stock holders may get a higher share of new profit of new product when compared to the old stockholders. If the new product is financed through debt finance, then a portion of the new profit arising out of the new product, will go to old stock holders. Therefore one can say, the firm with good prospectus will prepare financing through debt.
- 6.3 If the future prospects are not good, the firm may invite new investors to purchase stock and to share the new higher cost or losses. When new shares are issued, normally, the share price will come down.
- 6.4 This signaling theory holds good for smaller firms but not for larger firms having many financing options.
- 6.5 The surplus cash will normally be used for debt-servicing or to pay higher dividends or it may be used for perquisites or it may be used for further debt rising. Use of surplus cash for debt servicing is called "bonding the free cash flow".
- 6.6 The surplus cash may also be used to finance its own shares.
- 6.7 Higher the debt means, higher the problems for the managers in the form of risk of bankruptcy.
- 6.8 Now, it is clear that, an optimal capital structure means, the level at which the value of capital is maximized and the overall cost of capital is minimized.
- 6.9 In practical terms, it may be very difficult to determine precise optimal capital structures. Therefore using of leverages is purely of judgment approach to determine the composition of capital structures.
- 6.10 Outsiders, say, lenders, and analysis made by experts may influence the financial structure of a firm. These outsiders pressurize a firm to keep their debt activities below the existing industrial norms. A firm will have to pay heavy interest if it takes its debt activities beyond the existing industrial debt norms. It may even lead to a problem of encountering financial distress.
- 6.11 The fixed financial charges may also lead to financial distress, if the sinking fund payments are not grossed up from time to time.

- 6.12 A firm shall not use its full debt capacity. A gap should be maintained for scope to borrow money at any time. This will help the firm to borrow on favorable terms. When the borrowing rate is low and when borrowing is essential, it is better to go for debt financing because, at low cost of capital long term bonds can be obtained. This will be controlled by the EBIT divided by the total interest charges.
- 6.13 Major stock holders often attempt to takeover management from the existing management group by way of purchasing the minimum required number shares. Therefore, the existing management group must be careful about using equity leverage. On the other hand, creditors may assume control, in case of default as per debt agreement. All these factors will fix the management between the financial layers to use the leverages to determine the capital structure.
- 6.14 Change in capital structure will influence the future profitability and in turn it will have effect on other variables.
- 6.15 In practice, finance managers focus on identifying a level of debt, where they can be comfortable with getting all the benefits of debt and to keep the financial risk within these operational limits.

7. The Modigliani-Miller Model

- 7.1 Initially MM model is based upon the assumption of zero corporate or personal income taxes. In the absence of the taxes, the value of the firm is independent of its leverage.
- 7.2 They argued that, it does not matter, whether the company finances its activities by debt or by equity or with combination of both. The exemption of interest on debt from corporate tax also does not matter. They stressed that companies should finance their activities through debt or use their portion of profit to finance their activities.
- 7.3 As the use of debt rises, correspondingly cost of equity also rises.
- 7.4 The capital structure has got no effect on the value of a firm and its weighted average cost of capital (WACC)
- 7.5 With two company's modules, MM theory established that companies may differ from the point of how they are financed and their respective total market values
- 7.6 The investors may sell the shares of the higher valued firm and may resort to purchase shares of the lower-valued firm. This transaction will go up to a point where both the firms will have same market value. MM argues that disequilibrium finally must end and cannot persist. All these arguments are based

- upon further assumptions, that (i) EBIT is constant and (ii) earnings are paid out of dividends
- 7.7 The profit motive would bring the equilibrium in the values of the two firms. Therefore MM maintains that WACC and the firm's value must be independent of capital structure. In the cases where transactions costs are significant or in a situation of non-identical risk, this arbitrage process of MM theory cannot be invoked.
- 7.8 In 1958 MM theory assumed Zero tax and subsequently in 1963, they modified the theory by incorporating corporate taxes. Since the interest on debt finance is exempted from corporate tax, the leverage may have positive effect to increase a firm's value. Therefore, the value of levered firm will increase because of leverage when compared to the value of un-unlevered firm, because the unlevered firm will not have benefit of the value of tax savings. As the debt rises, gain from leverage raises.
- 7.9 The taxes reduce the effect of cost of debt equal to interest rate. Therefore the firm's value increases as it leverages increases.

8. The Hamada Model

- 8.1 The stand-alone risk is a measure of financial risk. The stand-alone risk can be reduced, by diversification in individual portfolios.
- 8.2 Robert Hamada merged CAPM and MM after-tax –model, to obtain the cost equity to a leveraged firm.
- 8.3 The rate of return on a stock at a particular required level can be classified in to:
- The risk free rate i.e., compensation to shareholders for the time value of money
 - A premium for business risk
 - A premium for financial risk
- 8.4 The premium for financial risk would be zero in the absence of financial leverage. In such situations the shareholders gets compensation only for business risk.
- 8.5 The addition of debt to the existing capital structure results in new value, resulting in a financial risk premium on the Stock. This will also add to the business risk premium.

9. Miller Model

- 9.1 Prof Merton Miller designed a new model incorporating both corporate tax and personal tax to show how leverage affects firm's values.

- 9.2 In other words the Miller model explains the possibility of estimating the value of a levered firm with both corporate and personal taxes.
- 9.3 The limitations of the MM and Miller models are as follows:-
- Personal and corporate leverage cannot be treated as perfect substitutes.
 - When operating income declines a leveraged firm tries to avoid bankruptcy by selling assets etc; In case of an unleveraged firm, by reducing dividends, they try to avoid bankruptcy. The equity holder in turn suffers.
 - The brokerage and other transaction costs influence the arbitrage process. One cannot assume such costs as Zero.
 - Borrowing rates varies from individual investors to large corporations. It can be the same in both the cases.
 - Assumption of automatic equilibrium between the firms having different values may not hold good.
 - The assumption of uniform corporation tax net is not realistic.
 - One cannot ignore the cost of financial distress or agency cost

10. Financial Distress

- 10.1 The threat of debt financing is the financial distress. Financial distress includes bankruptcy. Bankruptcy itself costs too much.
- 10.2 In addition, delay in settlements, delays liquidation of assets.
- 10.3 Distress sale always fetches low price.
- 10.4 Legal and administrative expenses are very high.
- 10.5 Withdrawal cost in the form of indirect loss e.g., withdrawal by customers is high.
- 10.6 Therefore the use of debt finance must be matched by earnings in terms of present value. Otherwise the firm will face the threat of distress finance.
- 10.7 It is also very difficult for a firm to raise capital either through debt or equity at the time of facing financial distress. Once financial distress commences or is a probability, the current value of a firm decreases.
- 10.8 The effect of distress may lead to default in debt payments. The victims are the bond holders.

11. Agency Costs

- 11.1 A firm may try to benefit the stockholders at the cost of bond holders. Therefore the bondholders prefer restrictive clauses in the covenants and they employ an agency to monitor the obedience of the firm to the clauses in the covenants.

Therefore, the cost of monitoring will be passed on to the stockholders. This agency cost may reduce the tax benefit arising out of interest amount. Some times it wipes out the tax benefit. This will have a major influence on the capital structure.

12. Signaling Model

- 12.1 Prof. Gordon Donaldson of Harvard made some findings saying that, (1) Firms try to manage with internal earnings. (2) They set targets regarding dividend share ratios based on the future investment opportunities and returns. (3) They are reluctant to raise dividends, because of the threat of difficulty in maintaining the raised dividends at all time (4) they use surplus cash for servicing of debt, to maintain dividend level, repurchase of shares, invest in other securities etc.
- 12.2 Equity finance will be raised in the form of earnings and new stock. First preference will be in favour of using retained earnings. If the retained earnings are not sufficient, a firm may go for debt financing rather than going for issuing of new stock. This will cause debt ratio to go up.

13. Conclusions

<p>The analysis of capital structure must focus both on market values and the book values. But a firm can stay on either of one. But the analysis is meant to find out the capital structure which maximizes the firm's market value. The credibility lies in the stock price. Therefore capital structure can be determined by an analysis of market values.</p>

CAPITAL BUDGETING DECISIONS

(Source:- Book on Financial Management by Prof. I.M. Pandey)

Capital budgeting means investment decisions involving fixed assets i.e., the long term assets used in production. The budget is a financial plan pertaining to inflows and outflows for a prescribed period. In capital budget focus will be on what is to be included.

Investments in fixed assets are meant for long term use. Therefore higher the investments in fixed assets, the lower are the flexibility. The forecasting of returns must correspond to the life of the fixed assets.

The threat of changing technology affecting the price and quality will heavily influence the investment in long term fixed assets. Once invested in long term fixed assets, going back may be impossible and such going back will be a costly affair.

Investment in Capital Assets (i.e., in large term assets) must be done in appropriate time. There must be match between the demand and the marketing of the goods produced. If these two are mismatched one cannot justify the investment in capital assets. Perhaps even it may be disastrous.

The firm must anticipate in advance when it needs to go in for new machinery or to change the existing one. Otherwise a firm may not be in a position to take advantage of the demands prevalent in the market.

Because of the various complications involved in capital budgeting, a firm has to plan the capital expenditure properly.

The proposal for capital budgeting may start from the demand for a particular new product in the market. This will lead to obtaining customers' opinion, demand analysis, limitations, capacity building, cost and price analysis and profit analysis, finally leading capital budgeting project.

The changing needs of the customers in terms of change in the product in terms of quality, quantity or for a new product or his opinion of uncomfortableness with the existing product, his opinion on price etc., will always influence the growth or expansion of a firm. A firm if it wants to survive must be able to be responsive to the changing needs of the customers. This will form the base for capital budgeting proposals. A firm must have strategic business plan to be flexible enough to meet the changing marketing challenges. The internal staff of a firm has to be encouraged to come up with the new capital investment proposals. Every proposal has to be screened, before selecting or rejecting. The analyzing of every such proposals itself, involves cost. The proposals may be categorized as follows:

1. Replacement of worn-out or damaged equipment to maintain the existing level of business

2. Replacement to reduce the cost
3. Expansion to raise the protection level.
4. New machinery installation for new product
5. To meet the changing legal requirement standards. For example, safety and environment protection.
6. Expansion or re-organization of R & D wing etc,

For screening purpose or from the point of prioritization and selection, a series of questions must be developed. More specific questions from the angle of marketing and profit should be encouraged. The strengths and weaknesses must be listed along with the driving forces and the restraining forces of a capital investment proposal.

The capital budgeting evaluation involves the following steps.

1. Determination of the cost of the project
2. Estimated cash flows
3. Salvage value of assets after its life span
4. Estimation of riskiness on cash flow (measurement of uncertainty)
5. Determination of discount factor to calculate the estimations in terms of present value
6. Finding out PV of cost
7. Calculation of NPV
8. Calculation of IRR

Ranking will be done by using the following methods:-

1. Pay back method
2. Discounted pay back
3. NPV
4. IRR
5. MIRR
6. PI

1. Payback Period

- 1.1 In how many years (period) can one recover the original investment? This is the essence of payback period. How quickly will the original investment be recovered?
- 1.2 Calculate this for each capital project to rank it. The capital project with shortest pay back period tops the list. To accept or reject proposed projects must be mutually exclusive.

2. Discounted Pay back period

- 2.1 In L.U.2 the DCFT has been explained in detail. Use the DCFT technique to convert the expected cash flows in terms of present value. The DCFT

will take in to account the capital cost. It may be defined as the number of years required to recover the investment from discounted net cash flows.

- 2.2 The pay back and the discounted pay back methods do not consider the returns after the payback period. Therefore ranking the projects by using these techniques may likely to be defective.

3. Net Present Value

- 3.1 Here also the DCFT financial concept has to be used to convert the cash inflows (including the salvage value) as well as cash outflows in terms of the present value of money. The difference will be the NPV. The project showing higher NPV will be ranked over the project showing lesser NPV.

4. Internal Rate of Return

- 4.1 In a project estimation, one has to find out a discount factor at which $NPV=0$, where the PV of returns is equal to PV of costs. The discount factor at which the $NPV=0$ the IRR exists. More than this, $NPV<0$ (negation) where PV of cost exceeds the PV of returns and the project is liable to be rejected. If the NPV is >0 (positive) where the PV of returns exceeds the PV of costs, the project will be selected. To rank the projects, the firms present discount factor based on the opportunity cost will be taken as base. The gap between this discount factor and the IRR (Where $NPV=0$) of each project will be compared on the positive side. The project with higher gap will be ranked.

5. Modified Internal rate of Return

- 5.1 In calculating IRR as shown on LU.2, the cash inflows will not be used for reinvestment. But in MIRR the cash inflows will be shown as reinvested.

6. Profitability index (PI)

- 6.1 This is based upon the benefit-cost ratio. The PV of benefit per P.V. of rupee (cost) will be determined. The higher the P.I., the higher the project ranking. After looking into the various methods of ranking one may prefer the NPV and IRR method to rank the capital investment projects. IRR is even more preferable because it clearly shows the safety margin in the form of gap between opportunity cost of firm and a discount factor at which $NPV=0$. The bigger organizations or when stakes are very high, a decision maker may like to employ all methods to reach conclusions.

6.2 Mere using of these quantitative methods to take decision may be misleading. The realities in the form of constraints, possible surfacing of new problems and above all commonsense i.e., prudence is required to rank the projects.

6.3 The major problem is, in reality, the longer the duration of the project, the higher the defectiveness of estimations. Because in the long run the positive NPV may be erased out and market may become even more imperfect. Above all estimations not based on inflation accounting even more be unrealistic, because inflation rate will reduce the real value of future returns.

6.4 In spite of all such limitations, firms are using one or the other method/s to take decisions.

7. Post-Audit

7.1 How far is the decision taken regarding the capital budget correct? This requires audit i.e., by comparing the predictions with actual performance and explaining the differences. The concurrent audit is even more preferable, so that, the monthly reports of actual under different indicators could be compared quickly with reference to estimations done. This will enable the management to make corrections during the subsequent operation process. This will improve the quality of subsequent estimates, and improve the operations etc.

Measurement of Risk

(Source:- From the book of Financial Management by Prof. M.Y. Khan & P.K. Jain)

Investments are always exposed to different degrees of risk. Every uncertainty or the degree of an uncertainty cannot be foreseen. Therefore a perfect prediction of cash flow is not possible. That means risk is associated with the blind area of uncertainty.

The events that influence the forecasts may be grouped as:

- Events that influence the level of business activity
- Events that affect an entire industry
- Event that may affect a company

Business activities will be influenced by monetary and fiscal policies, economic policies, political situations, law and order, industrial relations, changing technologies, natural problems, change in management, labor problems etc.,

Risk is available associated with future returns of an investment. The Government bonds are said to be risk-free because of 100% faith in Government where the default=0. This is not so in the case of investment in shares.

Risk and returns varies directly.

The concept of 'payback period' is used to measure risk in capital budgeting decision. The pay back period shows in what period, the investment can be recovered. This is the simplicity of the pay back period. It explains the period of liquidity through recovery of capital. An investor who prepares a short term project may prefer to use the payback period. The risk is associated with the length of the period to recover the capital. That means long-term projects are more risky than the short-term projects.

The payback period is suited to the assessment of risks of time nature. A person who prefers shorter term risk is ready to counter the common business risks. The uncommon risks, strike, war, natural disaster etc., may happen or may not happen. Only if the normal business risks go out of control or exceed the expected limits, will the investor suffer. The limitations of the pay back period is that it will not take into the account the time value of cash flows, lack of time pattern and it will ignore the returns after the recovery of capital required for decision making.

1. Risk-adjusted discount rate

- 1.1 Consider a situation where an investor invests Rs100 in Government bond at interest rate of 6%. Now this Government bond is called risk-free bond. If the same investor wants to invest the same Rs.100 in shares instead of in bond, the risk factor comes into picture as far as the return on Rs.100 share is concerned. In this situation, investor expects the returns i.e., more than 6% in the form of premium. Therefore the expected premium varies directly with the risk. The higher the risk, the higher will be the expected premium.
- 1.2 To apply the risk-adjusted discount rate, following steps must be followed:-
 - 1.2.1 Firstly, identify the discount factor based on the risk-free rate. This will take care of time preference.
 - 1.2.2 Secondly, identify a risk-premium rate. This will take care of risk preference.
 - 1.2.3 Thirdly, calculate the PV of Cash Flows at the discount factor equal to risk-free rate
 - 1.2.4 Fourthly, calculate the PV of cash flows at the discount factor equal to risk premium.

- 1.3 The variation in the discount factor reflects the investor attitude towards risk. The higher the discount factor, the less attractive the project. Therefore, higher rates will be used for riskier projects. The lower the discount factor, the more attractive the project, but the returns will be lower. Therefore lower rate will be used for less risky projects. An investor becomes more and more negative with a project of higher discount rate. This method shows only the degree of risk aversion. Therefore, if IRR method is also used, an investor can clearly perceive the risk of an investment project to accept or to reject.

2. Certainty Equivalent.

- 2.1 The estimates of cash flows should be reduced to some conservative level. It is up to the investor to determine his best estimate of cash flow, with Zero risk. Then the investor has to rise the estimate of returns and the corresponding raise in the level of risk, will be called as certainty equivalent coefficient. In other words, this co-efficient determines the relationship between the certain cash flows and the risky cash flows. In the certainty equivalent approach, the discount factor equal to risk-free rate will be taken as base to adjust cash flow.

- 2.2 The major point of risk is that it is an increasing function of time and decreasing function of return. This will be the simple reality in most of the situations. Exceptions may be there, where risk may be high until an investment reaches a gestation point and risk may come down substantially after the gestation period. In such kind of situation, certainty equivalent approach has got a better application when compared to the risk-adjusted discount rate.

3. Sensitivity Analysis

- 3.1 Anticipated revenue is a function of sales volume multiplied by the unit selling price. The estimated cash flows depend on the expected revenue and costs. The size of the market and share of the firm in a market decides the size of the sales. The changes in costs and the taxes will influence the estimated cash flows. It is very difficult to workout the correct estimation under each variable influencing the cash flows. When the basic estimation goes wrong the NPV or IRR forecasted figures will also goes wrong. To determine reliability we have, at least 3 values for each of the forecast.

- Pessimistic
- Likely
- Optimistic

NPV or IRR is to be calculated for all these three assumptions.

- 3.2 A given change in one of the variables will cause change in the NPV or IRR of a project. Analysis of change is called as sensitivity analysis. Only thing is we have to choose such variables which can influence NPV or IRR.
- 3.3 By causing change in one of the variables like volume, price, cost etc., the NPV or IRR of the project must be recalculated and an appropriate decision taken. The sales volume and the unit sale price is a most sensitive variable, because even the slightest change in them, will result in greater change in the NPV or IRR
- 3.4 The major advantage of sensitivity analysis is that it exposes inappropriate forecasts. In other words, the decision maker will be able distinguish between what is relevant and what is not relevant. He will clearer regarding the impact of different variables on cash flows. It will also help him tackle weak spots.
- 3.5 Sensitivity analysis is used to study the impact of combination of variables in different proportions on NPV or IRR of the project. This is know as Scenario Analysis.

4. Probability assignment

- 4.1 The trouble is always that of forecasting future cash flows. Even if cash flow is forecast, the second problem is that of reliability. The phrase used is always “most likely” rather than “exactly”. The question is ‘how to arrive at the "most likely" figure? This depends on the probability. Measuring an individual's opinion about the likelihood of an event occurring, is known as probability. Estimates of cash flows are made under "best guess", "high guess" and "low guess" with the percentage of probability. This probability will help us measure risk. Instead of taking probability as Best, High or Low Guess, it is safer to take it on a large number of points under independent, identical situations. The probability based on this is known as objective probability.
- 4.2 When cash flow is estimated, one may assign risk for each level of cash flow. In case of non-repetitive projects, apart from risk, it is associated with the problem of high degree of uncertainty.
- 4.3 After assigning probabilities to future events, the monetary values of the possible events should be multiplied with the probabilities of expected monetary value.

5. Standard Deviation as an absolute measure of risk

5.1 The dispersion of cash flows is the difference between the possible cash flows that can occur and their expected value. Risk analysis can also be made by finding out the dispersion of cash flows because such dispersion indicates the degree of risk. Risk is measured through Standard Deviation (SD). It measures the deviation about expected cash flow of each of the possible cash flows. A project with higher SD is a riskier one. In case of making a decision to choose a project by analyzing risk in absolute terms, the risk may be measured in relative terms. Such relative measure of risk is the coefficient of variation. Coefficient of variation is the standard deviation of the probability distribution divided by its expected value.

5.2 Probability distribution may be of a different nature. For example, cash flows may be independent over time i.e., the probability distributions for future periods are not dependent on each other. The second possibility is that the cash flow in one single time may influence the cash flow in another time.

5.3 A group exercise will be given to the participants to understand the intricacies of probability distribution under different situations, where the decision-maker will have to accept or reject the investment based projects.

6. Decision Trees

6.1 One investment decision may influence a number of future investment decisions. The present choices modify future alternatives. The activities invariably lead to sequence of decisions from time to time. Therefore, decisions links form a chain from present to future commitments. The technique to analyze such sequential decisions is known as decision tree approach.

6.2 One will take a decision based upon the future expectations, say accomplishment of events/s. The decision that we make today may influence the various alternative decisions in the future and thereby accomplishment of future events will also get affected. The decisions may also lead to chance event. Even though such chance event is not known still a probability distribution may be assigned to it. The displaying of relationship between a present decision and future events, relationship between a same present decision and the future decisions and their consequences. It will be mapped out like the branches of tree. Such graphic display is known as a decision tree.

- 6.3 Following steps should be followed to construct a decision tree.
- 6.3.1 Define the investment proposed
 - 6.3.2 List out the clearly identified alternative decisions
 - 6.3.3 Indicate the decision points, chance events and other data
 - 6.3.4 Locate on the tree branches, regarding projected cash flows, probability distribution, expected PV etc.,
 - 6.3.5 Analyze the results
 - 6.3.6 Select the best alternative
- 6.4 The decision tree approach is specifically useful for handling sequential investments. By looking into the tree we may think from the future to the present to identify the unprofitable branches. The point is to eliminate such unprofitable branches. This procedure will help us determine the optimum decision at various decision points.

7. Utility theory

- 7.1 Perhaps the utility theory may indicate the level of risk preference by the investors. Putting risk and return together in different combinations, the focus will be more on risk. The risk aversion in the form of threat is more. As risk points rise, the marginal utility for money decreases. A graph must be prepared from the point of Zero risk and lowest return. This will demonstrate the point at which a rational investor will try to maximize his utility. The risk preferences of the decision maker are directly incorporated in the capital budgeting analysis.

Cost of Capital including CAP-M

(Source:- From the book on Financial Management by Prof. I.M. Pandey)

Cost of capital can be used to evaluate a capital expenditure decision. The cost of capital will be used as discount factor to determine NPV or IRR of the capital invested projects. The focus will be on the measurement techniques of cost of capital.

The cost of capital is related to the objective of wealth-maximization of an organization. Decisions is meant to raise the wealth of the owners i.e., the share holders. For this purpose returns must be higher than the cost of the capital. The cost of the capital serves the purpose of acceptance or rejection of an investment proposal.

The cost of the capital has to be measured correctly. Otherwise, under-valuation of cost of capital may result in wrong acceptance and expectations may receive a setback. Similarly, overestimation of cost of capital may also result wrong decisions in the form of rejection of investment proposal. The following will be taken as base for the cost of capital:-

- The existing rate of interest will be used as discount factor for calculation of NPV or IRR
- Using an opportunity cost as cost of capital or the lending rate
- Interest rate on borrowing

Among the above, the interest rate on borrowing is commonly used as cost of capital.

Capital Finance may be obtained from a number of sources. The cost of obtaining funds from each source differs from each other. The total cost of these costs is called weighted cost of capital. There are two categories of costs, viz. (i) Explicit cost, and (ii) Implicit cost.

1. Explicit Cost

- 1.1 When a firm starts to raise funds for its capital requirement, a series of cash inflow takes place. If we focus on a particular type of fund raising and the consequent cash inflow arising from it, there will be consequent cash out flow on account of repayment towards principal, payment of interest, payment dividend etc. In this situation, the rate of return should be identified at the point at which PV of cash inflow is equal to PV of cash outflow. Such rate of return is the Explicit Cost. The company which borrows funds has to pay IRR to the suppliers of the funds.

2. Implicit Cost

2.1 When retained earnings are used as source of funding, there will be no explicit cost. The undistributed profits to share holders are the retained earnings. What will be the return, if these retained earnings are invested elsewhere? Such earnings will be taken as opportunity cost. This is known as the Implicit Cost of capital. Opportunity cost is based on the opportunity foregone by the firm in committing itself to a selected project, and that is also a dividend foregone by the shareholders.

2.2 Explicit or implicit costs are used as discount factors to calculate the present value of the cash flows to take investment decisions.

3. Capital will be financed from one or more of the following sources.

- Debt financing
- Preference share capital
- Equity capital
- Rights shares
- Retained earnings
- Convertible securities

In the following sections we will look at ways to measure the cost of the capital by taking into account the cost of funding capital.

4. Debt Financing

- 4.1 In case of debt issued at par, the interest on debt i.e., before-tax shall be taken as cost of debt. This will be taken as cost of capital. But the use of debt finance shall not reduce the dividends to share holders. The operational efficiency must go up along with the use of debt finance, so that the dividends to share holders will go up. That means earnings must certainly exceed the interest. Therefore the estimation of the project must be based upon the present values calculated on the base interest on debt as cost of capital.
- 4.2 The other important point is while floating debt, a firm has to incur cost towards floating charges. Therefore the cost of the capital is taken as interest on debt plus floating charges.
- 4.3 Since interest on debt is deductible from payment of corporate tax, after-tax cost of debt should be used.

- 4.4 In the case of debt issued at a premium, there will be a difference between the face value and the book value of such securities. In such cases the cost of debt will not be equal to the coupon rate of interest. If the premium is amortized for tax, it should be considered for determining the cost.
- 4.5 In case of perpetual debt financing, old bonds due for payment will be replaced by new bonds of the same value. In such a case the cost of capital will be determined by dividing the price at which the bond is sold multiplied by the fixed interest charges adjusted after tax-effect.
- 4.6 The current market yield of the debt will be used as cost of the capital, when debt is not used.
- 4.7 Only in case of profits earned, can dividends be paid to the shareholders. If the dividends are not paid up to the reasonable expectation level of the shareholders, the credibility of a firm may come down and shareholders may exercise their voting rights to change the management.
- 4.8 The dividends are payable in priority to preference shareholders and only the left out dividends are payable to ordinary share holders.
- 4.9 If the dividends are not paid, the market price of the shares will come down. Therefore, the firms always try to maintain the minimum credibility level of dividend payment.
- 4.10 The preference share is of two types:
- Irredeemable
 - Redeemable
- 4.11 The first one is treated as perpetual securities.
- 4.12 The amount payable on maturity date, in case of redeemable preference shares may be considered to determine the cost of capital. Dividends cannot be deducted to compute Tax. Therefore the cost of preference shares will be more than the cost of debt capital.
- 4.13 The equity holders invest with an expectation of returns in the form of dividends. The market value of shares of a company depends on the expectations of the dividends by equity holders.
- 4.14 The rate of return that equates the PV of the expected dividends with the market value of shares can be taken as cost of equity capital.

4.15 The EPS (Earning per Share) and the MVS (Market value of Shares) shall not be affected because of new issue of shares. The interests of the existing share holders shall be protected and the assets or liabilities are to be shared on pro-rata basis by the existing and the new share holders in case of winding up. Therefore the new shares shall not result in earning the EPS and the MVS. In such cases, the return on new investment shall be taken as cost of new shares, so that, the EPS or MVS will not be below the return on new investment. The new issue of shares will often called as external equity. The cost of this external equity can be calculated on the basis of dividend. In such cases, the cost of equity is the dividend yield plus the growth rate of shares. Such cost of equity must also be included with the floatation expenses incurred towards new shares.

- 4.16 The earnings method will also be used to measure the cost of external equity. In this method, the cost of equity will be computer on EPR (Earning Price Ratio) basis.
- 4.17 A company may allow the existing share holders to purchase new shares at a given price. This is known as 'Rights issues of shares'. It will be in the same ratio as determined in the board policy of a company. It will not be compulsory on the part of the existing shareholders to purchase the Right Shares. The existing shareholder will have option of selling his right share also. In case of rights shares, the cost of capital would be equal to cost of a direct issue of shares to the public at large.
- 4.18 A company may have the system of converting bonds or debentures or preference shares, after a prescribed period. The conversion may be at a specified price or at the prevailing market price. Such securities are called as convertible securities. In case of these convertible securities, the cost of capital shall be taken at that discount rate which equates the after-tax interest plus the expected conversion price.

5. Weighted Average cost of Capital

- 5.1 Financial decision must result in either accepting or rejecting a capital expenditure proposal. For this purpose an analysis of the specific cost of capital is required.
- 5.2 The use of debt finance may increase risk on the part of the shareholders and in turn this may be increase the cost of equity. On the other hand, higher the use of equity, may lead to increasing the debt borrowing capacity. Because of this effect of one on the other, we have to use the cost of the capital in a composite sense. This composite mix of capital is also known as WACC. We know that capital is raised from different sources. The cost of each source varies from each other. Therefore, weights are attached to each source depending on its cost. Putting all

this together amounts to composite cost. Again the source of funds may not be used in equal proportions to form capital structure. In such a situation application of WACC, rather than computing simple average cost, will be more reliable.

5.3 To calculate WACC the cost of each source of funds must, firstly, be identified. Secondly, the proportion of each source in the capital structure must be worked out with the cost of each source. Thirdly, the weighted costs of all sources of funds must be added. This sum is the weighted cost of capital. This shall be obtained on the after-tax basis. While calculating WACC book-value weights or market value weights, whichever is higher may be used.

5.4 In case of using new source of funds in a concern for the selection of a new project, the cost of raising new funds has to be taken as the basis of calculation. This is also known as the MCC (Marginal Cost of capital). The MCC is the cost of raising an additional rupee of capital. The proportion of funds in capital structure represents the marginal weights.

5.5 The proportion of funds from different sources in the capital structure is taken as base to calculate the MCC.

5.6 The cost may increase as the level of borrowed funds increases. Up to a certain level the cost on various sources of funds may remain constant and it may increase after the particular level. This will give rise to average cost of capital and the MCC will also rise.

5.7 Separate assignments will be given to participants to work out WACC in groups.

6. CAP-M (Capital Asset Pricing - Model)

6.1 CAPM is a method of valuing assets to calculate the cost of capital. It explains the movement of security prices. The CAPM approach helps investors assess the impact of an investment on a proposed security within the entire portfolio with reference to risk and return.

6.2 The CAPM approach is based on the assumption of efficient security markets and investor preferences. Efficiency market means that the investors will have common information about securities, including, Zero Taxes, Zero Restrictions on Investments or No Transaction Costs. No single person can influence the market price and all the investors will have common expectations. Preference will always be in favour of a security that gives highest return, if risk levels are equal among the given securities. If returns are equal, the investors will choose a low risk security. The main assumption of CAPM is that investors are risk averse. Based on this assumption, CAPM describes the risk required return as a trade off for securities.

- 6.3 Risks are of two types, viz., (i) Diversifiable, and (ii) Non-diversifiable.
- 6.4 Diversifiable Risk is also known as Unsystematic Risk. This represents the elimination or minimization of risk through diversification. It is called unsystematic because risk factors are treated as individual to each firm, and therefore factors which cause risk vary from firm to firm. Factors that influence risks are quality of management decisions, competitions in the market, using of leverages, rules and regulations, strikes, transport, location etc.
- 6.5 Factors that commonly influence risk of all firms are known as non-diversifiable risks or systematic risks. For example, inflation, economic policy, change in Government, changes in law, interest rate etc.
- 6.6 An investor can adopt the strategy of diversification to eliminate or reduce the unsystematic risk. Therefore, the focus of the following sections is on non-diversifiable risk.
- 6.7 According to CAPM approach, non-diversifiable risk can be measured in relation to the market portfolio. Non-diversifiable risk will be assessed in terms of the beta co-efficient. The movements of return in respect of a particular security related to returns of market portfolio are a measure of beta. In other words, beta measures the movement or change in return on a security in response to changes in market return. Therefore beta is an index of the degree of responsiveness of return on an investment with the market return. The market index shows the beta for the market portfolio. It will be measured by the broad-based market index.
- 6.8 A zero co-efficient indicate zero market related risk for the investment. A beta co-efficient equal to one indicates that the risk of a security is equal to the market risk. If the beta co-efficient is less than one, risk of a security and a market risk varies inversely. The required rate of market return for a given amount of systematic risk is known as the SML (security market line).
- 6.9 The CAPM explains the relationship between the cost of equity and the relevant risk of the firm as reflected in its index of non-diversifiable risk. The risk as shown in beta to determine the cost of equity will be considered by the CAPM.

7. Rational of the CAPM

- 7.1 Investors are always risk averse and try to eliminate risk. The risk is known as residual risk or alpha. This, they will do by holding a diversified portfolio of assets. Alpha risks are specifically associated with individual assets. The diversification of assets will reduce the risk. Certain risks like, say, recession is a non-diversifiable risk and it is not possible to eliminate it. The investor's expectation of returns will also be above the average of return on safer investments. The valuation of any particular asset depends on the effect of the

market risk on an asset price. Beta is the change of an asset price to change in overall market price, and a measure of relative volatility of the market risk contribution.

- 7.2 Risk free assets have beta close to Zero. The investors' normal expectancy will be over and above the return on risk free securities, in case they invest in shares, which are risky. This is known as premium over the risk-free rate. Such expected premium on all the assets shall be added to determine the average premium and this is to be multiplied by the particular asset's beta.

Income Valuation of Fixed Securities

(Source:- Financial Management and Policy by Prof. James.c.Vain Horne)

The following are the important fixed income securities:-

- Preference Shares
- Convertible Debentures
- Non-convertible debentures
- Indira Vikas Patras
- Government Securities
- Money market instruments

1. Preference Shares

- 1.1 Preference shares reflect a combination of some of the characteristics of equity shares and debentures. The features of preference shares are as follows :

1. Preference Shares carry fixed rate of dividend per annum.
2. Dividend on Preference Share is payable out of distributable profits. In case of inadequacy of distributable profits, the preference dividend is not payable.
3. Dividend on Preference Shares is generally cumulative. Dividend not paid in one year must be made up subsequently, and it has priority over equity.
4. Preference Shares are redeemable

2. Convertible Debentures

- 2.1 A convertible bond is converted into equity shares in future. It may be compulsory or optional. The features of this bond include conversion ratio, conversion price, conversion timing and conversion of the stock value.

2.2 Conversion Ratio

2.2.1 Conversion ratio is the ratio in which a bond can be exchanged for equity shares.

2.3 Conversion Price :

2.3.1 Conversion Price is the per share price paid for equity shares, that is by dividing the par value bond with the conversion ratio.

2.4 Conversion Timing

2.4.1 Bonds convertible in a specified period are referred to as conversion timing.

2.5 Conversion Value :

2.5.1 Conversion Value is the value of a bond equal to the market value of the equity shares in to which it can be converted. Conversion value can be obtained by multiplying the conversion ratio by the existing price of the firm's equity.

3. SEBI guidelines on conversions are as follows :-

- The conversion premium and conversion timing shall be mentioned in the prospectus.
- Conversion will be optional, if it takes place between 18 to 36 months.
- There must be compulsory credit rating, if the conversion period exceeds 18 months.

4. Non-Convertible Debentures:

4.1 Non convertible debentures are an instrument for raising long-term debt capital. It is like a promissory note. The features are as follows:

- A debenture issue is sold to the public through a trustee, usually a bank, to protect the interest of debenture holders.
- Debentures are secured by a charge on the immovable properties.
- For such debenture issues with maturity period of 18 months a Debenture Redemption Reserve (DRR) has to be created equivalent to at least 50 percent,.
- A Company is free to choose the coupon rate, which may be fixed or floating in relation to a benchmark rate.
- A company may choose its own maturity period.
- Debentures with a 'call' feature may be redeemed by the company before the maturity date. The debentures with a 'put' feature may be redeemed by the holder before the maturity date.

5. Public Sector Undertaking (PSU) Bonds:

- 5.1 There are two varieties of public sector undertaking (PSU) bonds, namely taxable bonds and tax free bonds. A PSU may issue tax-free bonds with the prior approval of the Ministry of Finance.
- 5.2 The features of PSU bonds are (a) no deduction of tax at source on the interest (b) easily transferable by endorsement (c) no stamp duty on transfer (d) tradable on stock exchanges.

6. Indira Vikas Patras (IVP):

- 6.1 The features of IVP are that:

It doubles in five and half years. Therefore an IVP is one-half of its face value. That means the compound interest on an IVP is 13.43 percent per annum. There is however, no income tax benefit for tax purposes. VIPs are bearer bonds. They are transferable by mere delivery.

7. Kisan Vikas Patras :

- 7.2 The features of KVPS are as follows:-

The maturity period is of five and a half years. Twice the amount is paid on maturity. Premature encashment facility is available after two and a half years.

8. Government Securities

- 8.1 Debt securities issued by the Government are referred to as gilt-edged securities. Three types of instruments are issued:
- An investment that resembles a company debenture.
 - A promissory note
 - A bearer security
- 8.2 The maturity period ranges from 3-20 years and interest rates vary from each other.

9. Money Market Instruments:

- 9.1 Money market instrument is a debt instrument with a short maturity period. For example, treasury bills, commercial paper, and certificates of deposit:

Treasury Bills: A Treasury bill issued by the Government has a maturity period of six months or one year issued at a discount and is repayable at par.

Commercial Paper: It is a short term unsecured promissory note issued by a firm. The features are as follows.

- The maturity period is about 180 days.
- It will be sold at a discount from its face value and redeemed at its face value.

Certificate of Deposit: It is a title to a negotiable time deposit with a commercial bank with a interest rate.

10.Mutual Fund Scheme: A mutual fund is a collective investment. Investor is a Part- owner.

11. Time Value of Money

11.1 The value of money changes with time. A Rupee today is more valuable than a rupee at the end of the year, because (i) current consumption is preferable to future consumption. (ii) Future value of the rupee depends on the expected returns on investment (iii) the purchasing power of the rupee may go down because of inflation.

11.2 Evaluation of cash flows at different points of time through the time value of money is, therefore, required. The details of calculating the present value of money has been dealt with in detail in Learning Unit 2.

12 Annuity: represents a stream of constant periodic payments or receipts.

13. Perpetuity: Perpetuity is an annuity of infinite duration.

14.Bond: A bond is an instrument of debt issued by an organization. The features of bonds are as follows :-

Par Value – is the value stated on the face of the bond.

14.1 It carries a specific interest rate, which is also called coupon rate. It will have a specific maturity period. The total return on bond will be calculated by using following formula:

$$\text{Total Return} = \frac{\text{Current income} + \text{Price Change}}{\text{Initial Investment}}$$

14.2 Bonds are often risk free. Bond prices vary with interest rate. Bonds may be subjected to default risk and inflation risk. Reinvestment rate may be lower than expected. A bond with a call feature entitles the issuer to prematurely redeem a

bond. This exposes the bond investor to call risk. Liquidity may be low.

14.3 The value of a bond will be expressed as,

$$\text{Value of A bond} = \left(\begin{array}{c} \text{Annual} \\ \text{interest} \\ \text{Payable} \end{array} \right) \left(\begin{array}{c} \text{present} \\ \text{value} \\ \text{annuity} \\ \text{factor} \end{array} \right) + \left(\begin{array}{c} \text{Redemption} \\ \text{value} \end{array} \right) \left(\begin{array}{c} \text{Discount} \\ \text{factor} \end{array} \right)$$

15. Yield to maturity

15.1 The rate of return that an investor receives is called yield to maturity. The rate of return depends on the risk associated with it. The ratings provided by independent credit rating agencies are useful to assess the risk.

15.2 A debt rating shows the probability of timely payment of interest and principal by a borrower. The higher the debt rating, the greater the credibility of the borrower. It does not recommend any transactions. Its focus will be on credit risk of the security. A debt rating has nothing to do with the performance of a firm. There is no legal relationship between debt rating agency and an investor. A debt rating is not an audit function. It is not enough to make a one time evaluation of risk to take one time decision; credit rating must be undertaken periodically.

16. Analysis of Fixed Income Instruments

16.1 A professional rating firm is likely to provide an unbiased opinion on the credit rating of a company. The methodology employed by different rating agencies varies from each other. Following are the common factors, however, that will be considered by all credit rating agencies.

- (a) Growth rate
- (b) Industry risk characteristics
- (c) Structure of industry
- (d) Nature of competition
- (e) Competitiveness
- (f) Management quality
- (g) Earning strength
- (h) Business risks
- (i) Financial risks
- (j) Asset protection
- (k) Cash flow
- (l) Financial flexibility and

(m) Accounting information

16.2 CRISIL (Credit Rating and Information Services of India Limited) Rating Symbols are as follows:

Debenture Rating Symbols		
AAA	Highest Safety	Highest Investment
AA	High Safety	Grades
A	Adequate Safety	Investment
BBB	Moderate Safety	Grades
BB	Inadequate Safety	
B	High Risk	Speculative
C	Substantial Risk	Grades
D	In Default	

Note: CRSIL may apply '+' (Plus) or '-' (minus) signs for rating from AA to D to reflect comparative standing within the category

Fixed Deposit Rating Symbols	
FAAA	Highest Safety
FAA	High Safety
FA	Adequate Safety
FB	Inadequate Safety
FC	High Risk
FD	Default

Note: CRSIL may apply '+' (Plus) or '-' (minus) signs for rating from FAA to FC to indicate the relative position within the rating category of the company raising fixed deposits

Short Term Instruments Rating Symbols	
P-1	Very strong Degree of safety
P-2	Strong Degree of Safety
P-3	Adequate Degree of Safety
P-4	Minimal Degree of Safety
P-5	Default Expected (or Actual)

Note: CRSIL may apply '+' (Plus) or '-' (minus) signs for rating from P-1 to P-3 to reflect comparatively higher standing within the category.

Fully convertible bonds and partially convertible bonds are subjected to the following SEBI guidelines.

The price with time shall be stated in the prospectus itself. Conversion will be optional at the hands of the bond holder, if it takes place between 18 to 36 months. Conversion is must with 'put' and 'call' options, if the conversion period is more than 36 months. If the conversion period exceeds 18 months credit rating is compulsory.

16.3 The convertible bonds are of three types;

- a) Compulsory convertible bonds with conversion option within 18 months.
- b) Optionally convertible bonds with conversion option within 36 months.
- c) Bonds carrying 'call' and 'put' features for conversion after 36 months.

16.4 On a compulsorily convertible (partly or fully) bond, an investor will receive a certain number of equity shares on part/full conversion and certain stream of interest and principal repayments. Therefore the value of such a bond is equal to the present value of equity shares receivable on conversion plus the present value of interest and principal payments receivable on the bond.

16.5 An optionally convertible bond may be viewed as a bond-warrant package. The value of optionally convertible bonds is a function of the following factors.

- Straight bond value
- Conversion value
- Option value

16.6 In case of Straight Bond value the value is that of discounted value of the interest and principal repayments receivable on it. The value of a straight bond varies directly with the value of the firm. The maximum value of a straight bond would be limited to the value of an equivalent risk-free bond.

16.7 The conversion value is equal to the stock price multiplied by the conversion rate.

16.8 In the case of Option value, the holder of a convertible bond cannot be compelled to sell. He can wait and choose the most profitable alternative.

17. Public Provident Fund:

17.1 The features of Public Provident Fund (PPF) scheme from the taxation point of view are as follows:

17.2 Benefits under sections of the Income Tax Act is limited to Rs.60, 000 i.e., a tax rebate of 15 percent of the annual subscription. The interest on PPF is exempted from taxes. Withdrawals are not subject to I.T.

18. Deep Discount Bonds.

18.1 Deep discount bonds having a face value will be issued at a deep discounted price with a longer maturity period from the date of allotment. The investor as well as the bond floating authority has the option to withdraw or redeem the bond respectively at the end of the prescribed period.

18.2 The two important features of a Deep Discount Bond are that (i) there is no reinvestment risk and (ii) the notional intermediate returns are not taxed.

19. Determinants for interest Rates

19.1 The price of a bond and the required rate of return vary inversely.

19.2 Short-term risk – free interest rate

19.3 Short term risk free interest rate is the yield on a one-year Government security.

19.4 The expected real rate of return is the rate at which society is willing to trade current consumption for future consumption.

19.5 Expected Rate of Inflation is the.-

$$\text{Price level} = \frac{\left(\begin{array}{c} \text{Money supply in} \\ \text{The economy} \end{array} \right) \left(\begin{array}{c} \text{Velocity of money} \\ \text{in circulation} \end{array} \right)}{\text{Real out put in the economy}}$$

Hence, the expected rate of inflation is nothing but the expected change in price level that is :

$$\text{Expected rate of inflation} = \frac{\left(\begin{array}{c} \text{Change in the Money} \\ \text{Supply in the economy} \end{array} \right) \left(\begin{array}{c} \text{Change in the} \\ \text{Velocity of money in} \\ \text{Circulation} \end{array} \right)}{\text{Change in the real out put of the economy}}$$

20. Maturity Premium

20.1 Maturity premium represents the difference between the yield to maturity on a short-term (one year) risk free security and the yield to maturity on a risk free security of a longer maturity.

21. Liquidity preference Theory

21.1 Investors have a preference for liquidity. So they ask for a higher yield as an inducement to hold bonds of longer maturity.

22. Default Premium

22.1 Because of the possibility that corporate bonds may default on interest and/or principal payment, investors will ask for a default premium, in addition, of course, to the maturity premium. The default premium is a direct function of default risk. The credit rating agencies considers:

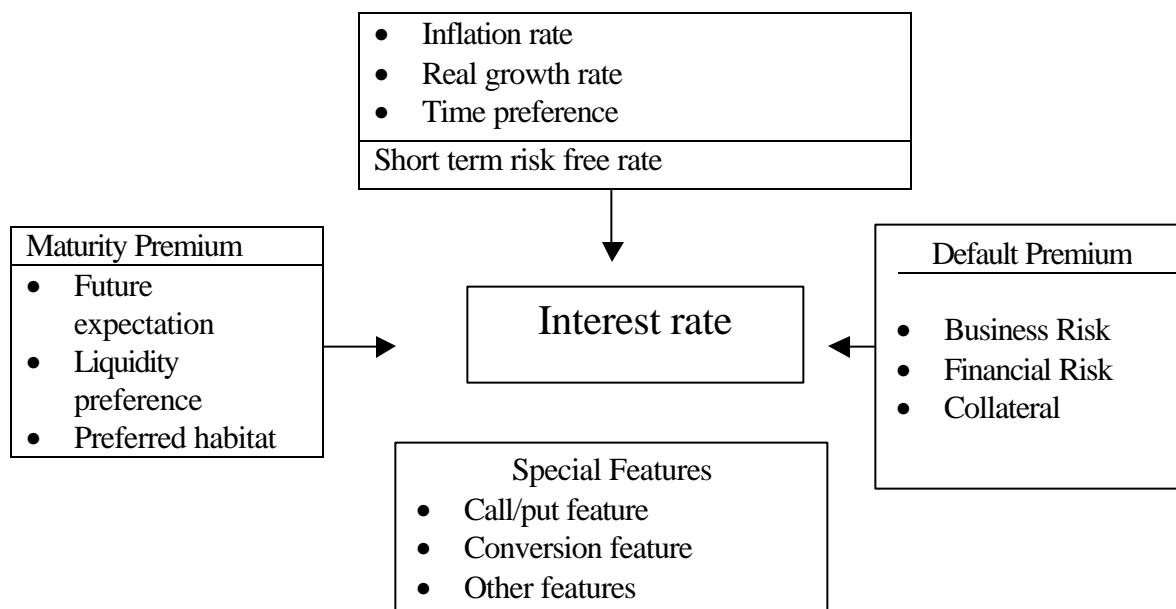
- a) Volatility of its operating income.
- b) Ratio of outside liabilities to shareholders funds
- c) Assets offered as security

22.2 Default premium tend to increase during economic recession and decrease during economic expansion.

23. The effect of special features on interest rates is expected to be as follows:

- A 'call' feature raises the interest rate because the investors are exposed to call risk.
- A 'put' feature lowers the interest rate because the investors enjoy the put option.
- A 'conversion' feature lowers the interest rate because the investors enjoy the option to convert.
- A 'floating interest rate' feature may lower the interest rate as investors are protected against inflation risk.
- A 'zero coupons' feature may lower the interest rate as investors are protected against reinvestment risk.

24. Determinants of interest Rate





Valuation of bonds and Stocks

(Source:- From the book on Financial Management and Policy by Prof. James.C.Vain Horne)

1. Investors have many choices when investing in bonds, but bonds are classified in to four main types, each of which differs with respect to the expected return and degree of risk:
 - Treasury
 - Corporate
 - Municipal
 - Foreign
- 1.1 Treasury bonds are sometimes referred to as Government bonds. It is reasonable to assume that the Government will make good on its promised payments, so these bonds have no default risk. However, Treasury bond prices decline when interest rates rise, so they are not free of all risks.
- 1.2. Corporate bonds are issued by Corporations. Corporate bonds are exposed to default risk – if the issuing company gets into trouble, it may be unable to make good the promised interest and principal payments. Different corporate bonds have different levels of default risk, depending on the issuing company's characteristics and on the terms of the specific bond. Default risk often is referred to as "Credit risk. The larger the default or credit risk, the higher the interest rate the issuer must pay.
- 1.3 Municipal Bonds.- are issued by state and local Governments.
- 1.4 Foreign bonds.- are issued by foreign governments or foreign corporations. Foreign corporate bonds are, of course, exposed to default risk, and so are some foreign government bonds. An additional risk exists if the bonds are denominated in a currency other than that of the investor's home currency.

2. Par Value

- 2.1 The par value is the stated face value of the bond. The par value generally represents the amount of money the firm borrows and promises to repay on the maturity date.

3. Coupon Interest Rate

- 3.1 The coupon payment if divided by the par value, results in the coupon interest rate.

4. Provisions to call (or Redeem) Bonds)

- 4.1. Most corporate bonds contain a call provision, which gives the issuing corporation the right to call the bonds for redemption. The call provision generally states that the company must pay the bondholders an amount greater than the par value if they are called. The additional sum, which is termed a *call premium*, is typically set equal to one year's interest if the bonds are called during the first year.
- 4.2. However, bonds are often not callable until several years (generally five to ten) after they are issued. This is known as *deferred call*, and the bonds are said to have *call protection*.
- 4.3. Suppose a Company sold bonds when interest rates were relatively high. Provided the issue is callable, the company could sell a new issue of low-yielding securities if and when interest rates drop. It could then use the proceeds of the new issue to retire the high-rate issue and thus reduce its interest expense. This process is called a *refunding operation*.
- 4.4. A call provision is valuable to the firm but potentially detrimental to investors. If interest rates go up the company will not call the bond, and the investor *will* be stuck with the original coupon rate on the bond even though interest rates in the economy have risen sharply. However, if interest rates fall, the company will call the bond and pay off investors, who will then have to reinvest the proceeds at the current market interest rate, which is lower than the rate investors were getting on the original bond. In other words, the investor loses when interest rates go up, but doesn't reap the gains when rates fall. To induce an investor to take this type of risk, a new issue of callable bonds must provide a higher interest rate than an otherwise similar issue of non-callable bonds.
- 4.5. Bonds that are **redeemable at par** at the holder's option protect the holder against a rise in interest rates. If rates rise, the price of fixed-rate bonds declines. However, if holders have the option of turning their bonds in and having them redeemed at par, they are protected against rising rates.

5. Sinking Funds

- 5.1. Some bonds include a **sinking fund provision** designed to facilitate the orderly retirement of the issue. Typically, the sinking fund requires the firm to retire a portion of the bonds each year. On rare occasions the firm may be required to deposit money with a trustee, who invests the funds and then uses the accumulated sum to retire the bonds when they mature. Usually, though, the sinking fund is used to buy back a certain percentage of the issue each year. A failure to meet the sinking fund requirement causes the bond issue to be thrown in to default, which may force the company into bankruptcy; obviously, a sinking fund can constitute a significant cash drain on the firm.

6. Other types of bonds

- 6.1 First **Convertible bonds** are bonds that are convertible into shares of common stock, at a fixed price, at the option of the bondholder. Convertibles have a lower coupon rate than non-convertible debt, but they offer investors a chance for capital gains in exchange for the lower coupon rate. Bonds issued with **warrants** are similar to convertibles. Warrants are options which permit the holder to buy stock for a stated price, thereby providing a capital gains if the price of the stock rises. Bonds that are issued with warrants, like convertibles, carry lower coupon rates than straight bonds.
- 6.2 Another type of bond is an **income bond**, which pays interest only if the interest is earned. These securities cannot bankrupt a company, but from an investor's standpoint they are riskier than "regular" bonds. Yet another bond is the indexed, or **purchasing power, bond**. The interest rate paid on these bonds is based on the consumer price index, so the interest paid rises automatically when the inflation rate rises, thus protecting the bondholders against inflation.

7. Bond Valuation

- 7.1 The value of any financial asset is simply the present value of the cash flows the asset is expected to produce.
- 7.2 The cash flows from a specific bond depend on its contractual features.
- | | |
|-----|---|
| 7.3 | The bond's riskiness, liquidity and years to maturity, as well as supply and demand conditions in the capital markets - all influence the interest rate on bonds. |
|-----|---|
- 7.4 At the time a coupon bond is issued, the coupon is generally set at a level that will cause the market price of the bond to equal its par value.
- 7.5 A bond that has just been issued is known as a *new issue*. Once the bond has been on the market for a while, it is classified as an *outstanding bond*, also called a *seasoned issue*. Newly issued bonds generally sell very close to par, but the prices of seasoned bonds often vary widely from par.

8. Key Points

Whenever the going rate of interest, is equal to the coupon rate, a *fixed-rate* bond will sell at its par value. Normally, the coupon rate is set equal to the going rate when a bond is issued, causing it to sell at par initially.

1. Interest rates do change over time, but the coupon rate remains fixed after the bond has been issued. Whenever the going rate of interest *rises above* the coupon rate, a fixed-rate bond's price will fall below its par value. Such a bond is called a **discount bond**

2. Whenever the going rate of interest *falls below* the coupon rate, a fixed-rate bond's price will rise *above* its par value. Such a bond is called a **premium bond**.
3. Thus, an *increase* in interest rates will cause the prices of outstanding bond to *fall* whereas a decrease in rates will cause bond prices to rise.
4. The market value of a bond will always approach its par value as its maturity date approaches, provided the firm does not go bankrupt.

These points are very important, for they show that bondholders may suffer capital losses or make capital gains, depending on whether interest rates rise or fall after the bond was purchased.

9. Bond Yields

9.1 If you examine a price sheet put out by a bond dealer, you will typically see information regarding each bond's maturity date, price, and coupon interest rate. You will also see the bond's reported yield. Unlike the coupon interest rate, which is fixed, the bond's yield varies from day to day depending on current market conditions. Moreover, the yield can be calculated in three different ways, and three "answers" can be obtained. These different yields are described in the following sections.

10. Yield to Maturity

- 10.1 The interest rate generally discussed by investors when they talk about rates of return. The yield to maturity is generally the same as the market rate of interest.
- 10.2 The yield to maturity can also be viewed as the bond's *promised rate of return*, which is the return that investors will receive if all the promised payments are made. However, the yield to maturity equals the *expected rate of return* only if (1) the probability of default is zero and (2) the bond cannot be called. If there is some default risk, or if the bond may be called, then there is some probability that the promised payments to maturity will be called, then there is some probability that the promised payments to maturity will not be received in which case the calculated yield to maturity will differ from the expected return.
- 10.3 The YTM for a bond that sells at par consists entirely of an interest yield, but if the bond sells at a price other than its par value, the YTM will consist of the interest yield plus a positive or negative capital gains yield. Note also that a bond's yield to maturity changes whenever interest rates in the economy change, and this is almost daily. One who purchases a bond and holds it until it matures will receive the YTM that existed on the purchase date, but the bond's calculated YTM will change frequently between the purchase date and the maturity date.

11. Yield to Call

- 11.1 If you purchased a bond that was callable and the company called it, you would not have the option of holding it until it matured. Therefore, the yield to maturity would not be earned.
- 11.2 If current interest rates are well below an outstanding bond's coupon rate, then a callable bond is likely to be called, and investors will estimate its most likely rate of return as the yield to call (YTC) rather than as the yield to maturity.

12. Current Yield

- 12.1 If you examine brokerage house reports on bonds, you will often see reference to a bond's **current yield**. The current yield is the annual interest payment divided by the bond's current price.

12.2 Unlike the yield to maturity, the current yield does not generally represent the return that investors should expect from holding the bond. The current yield provides information about the cash income a bond will generate in a given year, but since it does not take account of capital gains or losses that will be realized if the bond is held until maturity (or call), it does not provide an accurate measure of the total expected return.

- 12.3 The fact that the current yield does not provide an accurate measure of the total return can be illustrated with a zero coupon bond. Since zeros pay no annual income, they always have a current yield of zero. This indicates that the bond will not provide any cash interest income, but since it will appreciate in value over time, its total return clearly exceeds zero.

12.4 Although some bonds pay interest annually, the vast majority actually pay interest semiannually.

13. Interest rate risk

- 13.1 Interest rates go up and down over time, and an increase in interest rates leads to a decline in the value of an outstanding bond. This risk of a decline in bond values due to rising interest rates is called **interest rate risk**. Interest rates can and do rise, and rising rates cause a loss of value for bond holders. Thus, people or firms who invest in bonds are exposed to risk from changing interest rates.
- 13.2 One's exposure to interest rate risk is higher on bonds with long maturities than on those maturing in the near future.
- 13.3 *The longer the maturity of the bond, the more its price changes in response to a given change in interest rates.* Even if the risk of default on two bonds is exactly

the same, the one with the longer maturity is typically exposed to more risk from a rise in interest rates.

- 13.4 The prices of long-term bonds are more sensitive to changes in interest rates than are short-term bonds. To induce an investor to take this extra risk, long term bonds must have a higher expected rate of return than short-term bonds. This additional return is the maturity risk premium (MRP). Therefore, one might expect to see higher yields on long-term than on short-term bonds.
- 13.5 The longer maturity bonds must have a higher expected rate of return to compensate for their higher risk.

14. Reinvestment Rate Risk

- 14.1 As we saw in the preceding section, an *increase* in interest rates will hurt bond holders because it will lead to a decline in the value of a bond portfolio. But can a *decrease* in interest rates also hurt bondholders? The answer is yes, because if interest rates fall, a bondholder will probably suffer a reduction in his or her income. For example, consider a retiree who has a portfolio of bonds and lives off the income they produce. He has to replace with lower-yielding bonds and suffer reduction in income.
- 14.2 The risk of an income decline due to a drop in interest rates is called **reinvestment rate risk**, and its importance has been demonstrated to all bondholders in recent years as a result of the sharp drop in rates since the mid 1980s. Reinvestment rate risk is obviously high on callable bonds. It is also high on short maturity bonds, because the shorter the maturity of a bond, the fewer the years when the relatively high old interest rate will be earned, and the sooner the funds will have to be reinvested at the new low rate. Thus, retirees whose primary holdings were short-term bonds were hurt badly by the recent decline in rates, but holders of long term bonds are still enjoying their old high rates. Another important risk associated with bonds is default risk. If the issuer defaults, investors receive less than the promised return on the bond. Therefore, investors need to assess a bond's default risk before making a purchase. The greater the default risk, the higher the bond's Yield to maturity. The default risk on Treasury securities is Zero, but default risk can be substantial for corporate and municipal bonds.
- 14.3 Suppose two bonds have the same promised stream of cash flows, coupon rate, maturity, liquidity, and inflation exposure, but different levels of default risk. Investors will naturally pay less for the bond with the greater chance of default. As a result, bond with higher default risk will have higher interest rates. If its default risks changes, this will affect the price of a bond.

- 14.4 Default risk affected by both the financial strength of the issuer and the terms of the bond contract, especially whether collateral has been pledged to secure the bond.
- 14.5 An **indenture** is a legal document that spells out the rights of both bondholders and the issuing corporation, and a **trustee** is an official (usually a bank) who represents the bondholders and makes sure the terms of the indenture are carried out. The indenture may be several hundred pages in length, and it will include **restrictive covenants** that cover such points as the conditions under which the issuer can pay off the bonds prior to maturity, the level at which the issuer's times-interest-earned ratio must be maintained if the company is to issue additional debt, and restrictions against the payment of dividends unless earnings meet certain specifications.
- 14.6 The trustee is responsible for monitoring the covenants and for taking appropriate action if a violation does occur. What constitutes "appropriate action" varies with the circumstances. It might be that to insist on immediate compliance would result in bankruptcy and possibly large losses on the bonds. In such a case, the trustee might decide that the bondholders would be better served by giving the company a chance to work out its problems and thus avoid forcing it into bankruptcy.
- 14.7 Under a **mortgage bond**, the corporation pledges certain assets as security for the bond.
- 14.8 The *second mortgage bonds* can also be secured. In the event of liquidation, the holders of these second mortgage bonds would have a claim against the property, but only after the first mortgage bondholders had been paid off in full. Thus, second mortgages are sometimes called *junior mortgages*, because they are junior in priority to the claims of *senior mortgages or first mortgage bonds*.
- 14.9 These indentures are generally open ended meaning that new bonds can be issued from time to time under the existing indenture. However, the amount of new bonds that can be issued is virtually always limited to a specified percentage of the firm's total "bondable property," which generally includes all land, plan, and equipment.
- 14.10 A **debenture** is an unsecured bond, and as such it provides no lien against specific property as security for the obligation. Debenture holders are, therefore, general creditors whose claims are protected by property not otherwise pledged. In practice the value of debentures depends both on the nature of the firm's assets and on its general credit strength.
- 14.11 **Subordinated Debentures:** The term *subordinate* means "below", or "inferior to," and, in the event of bankruptcy, subordinated debt has claims on assets only after senior debt has been paid off. **Subordinated debentures** may be

subordinated either to designated notes payable (usually bank loans) or to all other debt. In the event of liquidation or reorganization, holders of subordinated debentures cannot be paid until all senior debt, as named in the debentures' indenture, has been paid.

14.12 Some companies may be in a position to benefit from the sale of either **development bonds** or **pollution control bonds**. State and local governments may set up both *industrial development agencies* and *pollution control agencies*. These agencies are allowed, under certain circumstances, to sell **tax-exempt bonds**, then to make the proceeds available to corporations for specific uses deemed to be in the public interest.

14.13 **Municipal Bond Insurance**, Municipalities can have their bonds insured, in which an insurance company guarantees to pay the coupon and principal *payments* should the issuer default. This reduces risk to investors, who will thus accept a lower coupon rate for an insured bond vis-à-vis an uninsured one. Even though the municipality must pay a fee to get its bonds insured, its savings due to the lower coupon rate often makes insurance cost-effective.

15. Basis for bond ratings:

Bond ratings are based on both qualitative and quantitative factors, some of which are listed below:

1. **Ratios:** How strong are the debt ratio, the times-interest-earned ratio, the fixed charge coverage ratio, the current ratio, and other ratios? The better the ratios, the higher the bond's rating.
2. **Mortgage provisions:** Is the bond secured by a mortgage? If it is, and if the property has a high value in relation to the amount of bonded debt, the bond's rating is enhanced.
3. **Subordination provisions:** Is the bond subordinated to other debt? If so, it will be rated at least one notch below the rating to the amount of bonded debt, the bond's rating is enhanced.
4. **Guarantee provisions:** Some bonds are guaranteed by other firms. If a weak company's debt is guaranteed by a strong company (usually the weak company's parent), the bond will be given the strong company's rating.
5. **Sinking fund:** Does the bond have a sinking fund to ensure systematic repayment? This feature is a plus factor to the rating agencies.
6. **Maturity:** Other things the same, a bond with a shorter maturity will be judged less risky than a longer-term bond, and this will be reflected in the ratings.
7. **Stability:** Are the issuer's sales and earnings stable?
8. **Regulation:** Is the issuer regulated, and could an adverse regulatory climate cause the company's economic position to decline? Regulation is especially important for utilities, railroads, and telephone companies.
9. **Antitrust:** Are any antitrust actions pending against the firm that could erode its position?

10. **Overseas operations:** What percentage of the firm's sales, assets, and profits are from overseas operations, and what is the political climate in the host countries?
11. **Environmental factors:** Is the firm likely to face heavy expenditures for pollution control equipment?
12. **Product liability:** Are the firm's products safe? The tobacco companies today are under pressure, and so are their bond ratings.
13. **Pension liabilities:** Does the firm have unfunded pension liabilities that could pose a future problem?
14. **Labor unrest:** Are there potential labor problems on the horizon that could weaken the firm's position? As this is written, a number of airlines face this problem, and it has caused their ratings to be lowered.
15. **Accounting policies:** If a firm uses relatively conservative accounting policies, its reported earnings will be of "higher quality" than if it uses less conservative procedures. Thus, conservative accounting policies are plus factors in bond ratings.

Importance of Bond Ratings: Bond ratings are important both to firms and to investors. First, because a bond's rating is an indicator of its default risk, the rating has a direct, measurable influence on the bond's interest rate and the firm's cost of debt. Second, most bonds are purchased by institutional investors rather than individuals, and many institutions are restricted to investment-grade securities.

16. Bond markets

- 16.1 Corporate bonds are traded primarily in the over-the-counter market. Most bonds are owned by and traded among the large financial institutions (for example, life insurance companies, mutual funds, and pension funds, all of which deal in very large blocks of securities), and it is relatively easy for the over-the-counter bond dealers to arrange the transfer of large blocks of bonds among the relatively few holders to arrange the transfer of large blocks of bonds among the relatively few holders of the bonds. It would be much more difficult to conduct similar operations in the stock market among the literally millions of large and small stockholders, so a higher percentage of stocks trade on the exchanges.

17. Stocks and their valuation

- 17.1 The common stockholders are *owners* of a corporation, and as such they have certain rights and privileges.
- 17.2 It is common that stockholders have the right to elect a firm's directors, who, in turn, elect the officers who manage the business. In a small firm, the major stockholder typically assumes the positions of president and chairperson of the board of directors. In a large publicly owned firm, the managers typically have some stock, but their personal holdings are generally insufficient to give them voting control. Thus, the management of most publicly owned firms can be removed by the stockholders if they decide the management team is not effective.

- 17.3 State and federal laws stipulate how stockholder control is to be exercised. First corporations must hold an election of directors periodically.
- 17.4 Stockholders can appear at the annual meeting and vote in person, but typically they transfer their right to vote to a second party by means of a **proxy**. Management always solicits stockholders' proxies and usually gets them. However, if earnings are poor and stockholders are dissatisfied, an outside group may solicit the proxies in an effort to overthrow management and take control of the business. This is known as a **proxy fight**.
- 17.5 The question of control has become a central issue in recent years. The frequency of proxy fights has increased, as have attempts by one corporation to take over another by purchasing a majority of the outstanding stock. This latter action is called a **takeover**
- 17.6 Managers who do not have majority control (more than 50 percent of their firms' stock) are very much concerned about proxy fights and takeovers, and many of them attempt to get stockholder approval for changes in their corporate charters that would make takeovers more difficult.
- 17.7 Common stockholders often have the right, called the **preemptive right**, to purchase any new shares sold by the firm. In some states, the preemptive right is automatically included in every corporate charter.
- 17.8 The purpose of the preemptive right is twofold. First, it enables current stockholders to maintain control. If it were not for this safeguard, the management of a corporation could issue a large number of additional shares and purchase these shares itself. Management could thereby seize control of the corporation and frustrate the will of the current stockholders.

18. Types Of Common Stock

- 18.1 Although most firms have only one type of common stock, in some instances **classified stock** is used to meet the special needs of the company. Generally, when special classifications of stock are used, one type is designated *Class A*, another *Class B*, and so on. Small, new companies seeking funds from outside sources frequently use different types of common stock. For example, when Genetic Concepts went public recently, its *Class A* stock was sold to the public, and it received a dividend, but this stock had no voting rights for five years. Its *Class B* stock, which was retained by the organizers of the company, had full voting rights for five years, but the legal terms stated that dividends could not be paid on the *Class B* stock until the company had established its earning power by building up retained earnings to a designated level. The use of classified stock thus enabled the public to take a position in a conservatively financed growth company without sacrificing income, while the founders retained absolute control during the crucial early stages of the firm's development. At the same time,

outside investors were protected against excessive withdrawals of funds by the original owners. As is often the case in such situations, the Class B stock was called **founders' shares**.

- 18.2 The right to vote is often a distinguishing characteristic between different classes of stock. Suppose two classes of stock differ in but one respect; one class has voting rights but the other does not.

19. The Market for Common Stock

- 19.1 Some companies are so small that their common stocks are not actively traded; they are owned by only a few people, usually the companies' managers. Such firms are said to be **privately owned**, or **closely held, corporations**, and their stock is called **closely held stock**. In contrast, the stocks of most larger companies are owned by a large number of investors, most of whom are not active in management. Such companies are called **publicly owned corporations**, and their stock is called **publicly held stock**.
- 19.2 As we saw in Chapter 4, the stocks of smaller publicly owned firms are not listed on an exchange; they trade in the **over-the-counter (OTC) market**, and the companies and their stocks are said to be **unlisted**. However, larger publicly owned companies generally apply for listing on an **organized security exchange**, and they and their stocks are said to be **listed**.
- 19.3 The institutional investors have a heavy influence on the prices of individual stocks.

20. Types of Stock Market Transactions

- 20.1 Trading in the outstanding shares of established, publicly owned companies: the secondary market.
- 20.2 Additional shares sold by established, publicly owned companies: the primary market.
- 20.3 Initial public offerings by privately held firms: the IPO (Initial Public Offering)

21. Common Stock Valuation

- 21.1 Common stock represents an ownership interest in a corporation, but to the typical investor, a share of common stock is simply a piece of paper characterized by two features:
- 21.2 It entitles its owner to dividends, but only if the company has earnings out of which dividends can be paid, and only if management chooses to pay dividends rather than retaining and reinvesting all the earnings. Whereas a bond contains a *promise* to pay interest, common stock provides no such promise – if you own a stock, you may *expect* a dividend, but your expectations may not in fact be met.

- 21.3 Stock can be sold at some future date, hopefully at a price greater than the purchase price. If the stock is actually sold at a price above its purchase price, the investor will receive a *capital gain*. Generally, at the time people buy common stocks, they do expect to receive capital gains; otherwise, they would not buy the stocks. However, after the fact, one can end up with capital losses rather than capital gains.
- 21.4 Common stocks provide an expected future cash flow stream, and a stock's value is found in the same manner as the values of other financial assets – namely, as the present value of the expected future cash flow stream. The expected cash flows consist of two elements: (1) the dividends expected in each year and (2) the price investors expect to receive when they sell the stock. The expected final stock price includes the return of the original investment plus an expected capital gain.
- 21.5 The managers seek to maximize the values of their firm's stocks. A manager's actions affect both the stream of income to investors and the riskiness of that stream.
- 21.6 The value of a bond is the present value of interest payments over the life of the bond plus the present value of the bond's maturity (or par) value;
- 21.7 For any individual investor, the expected cash flows consist of expected dividends plus the expected sale price of the stock. However, the sale price the current investor receives will depend on the dividends some future investor expects. Therefore, for all present and future investors in total, expected cash flows must be based on expected future dividends. Put another way, unless a firm is liquidated or sold to another concern, the cash flows it provides to its stockholders will consist only of a stream of dividends. Therefore, the value of a share of its stock must be established as the present value of that expected dividend stream.
- 21.8 A security that is expected to pay a constant amount each year forever is called perpetuity. *Therefore, a zero growth stock is perpetuity.*
- 21.9 Although a zero growth stock is expected to provide a constant stream of dividends into the indefinite future, each dividend has a smaller present value than the preceding one, and as the years get very large, the present value of the future dividends approaches zero.
- 21.10 The earnings and dividends of most companies are expected to increase over time. Expected growth rates vary from company to company, but dividend growth on average is expected to continue in the foreseeable future at about the same rate as that of the nominal gross domestic product (real GDP plus inflation). On this basis, one might expect the dividend of an average, or "normal", company to grow at a rate of 6 to 8 percent a year.

- 21.11 Growth in dividends occurs primarily as a result of growth in earnings per share (*EPS*). Earnings growth, in turn, results from a number of factors, including (1) inflation, (2) the amount of earnings the company retains and reinvests, and (3) the rate of return the coming years on its equity (*ROE*). Regarding inflation, if output (in units) is stable, but both sales prices and input costs rise at the inflation rate, then *EPS* will also grow at the inflation rate. Even without inflation, *EPS* will also grow as a result of the reinvestment, or plowback, of earnings. If the firm's earnings are not all paid as dividends (that is, if some fraction of earnings is retained), the dollars of investment behind each share will rise over time, and that should lead to growth in earnings and dividends.
- 21.12 Even though a stock's value is derived from expected dividends, this does not necessarily mean that corporations can increase their stock prices by simply raising the current dividend. Shareholders care about *all* dividends, both current and those expected in the future. Moreover, there is a trade-off between current dividends and future dividends. Companies that pay high current dividends have less money to retain and reinvest in the business, and that lowers the rate of growth in earnings and dividends. So, the issue is this: Shareholders prefer to have the company retain earnings, hence pay less current dividends, if it has highly profitable investment opportunities, but they want the company to pay earnings out if its investment opportunities are poor. Taxes also play a role, as dividends and capital gains are taxed differently, so dividend policy affects investors' taxes.
- 21.13 Thus, we would expect to make a capital gain of $\$24.84 - \$23.00 = \$1.84$ during 1999, which would provide a capital gains yield of 8 percent:

$$\text{Capital gains yield}_{1999} = \frac{\text{Capital gain}}{\text{Beginning price}} = \frac{\$1.84}{\$23.00} = 0.08 = 8\%$$

- 21.14 We could extend the analysis on out, and in each future year the expected capital gains yield would always equal *g*, the expected dividend growth rate.

Continuing, the dividend yield in 2000 could be estimated as follows:

$$\text{Dividend yield}_{2000} = \frac{D_{2000}}{P_{12/3/99}} = \frac{\$1.3414}{\$24.84} = 0.054 = 5.4\%$$

For a constant growth stock, the following conditions must hold:

1. The dividend expected to grow forever at a constant rate,
2. The stock price is expected to grow at that same rate
3. The expected dividend yield is a constant

4. The expected capital gains yield is also a constant, and it is equal to
 5. The expected total return, is equal to the expected dividend yield plus the expected growth rate :
- 21.15 Consider the situation of a startup company formed to develop and market a new product. Such a company generally expects to have low sales during its first few years as it develops and begins to market its product. Then, if the product catches on, sales will grow rapidly for several years.
- 21.16 Asset growth must be financed by increasing some liability and/or equity account. Small firms can often obtain some bank credit, but they must maintain a reasonable balance between debt and equity. Thus, additional bank borrowings require increases in equity, but small firms have limited access to the stock market. Moreover, even if they can sell stock, their owners are often reluctant to do so for fear of losing voting control. Therefore, the best source of equity for most small businesses is from retaining earnings, so most small firms pay no dividends during their rapid growth years. Eventually, most successful firms do pay dividends, with dividends growing rapidly at first but then slowing down as the firm approaches maturity.

22. Comparing the Total Company and Dividend Growth Models.

22.1 Since the total company and dividend growth models give the same answer, does it matter which model you choose? In general, it does. For example, if you were a financial analyst estimating the values of mature companies whose dividends are expected to grow steadily in the future, it would probably be more efficient to use the dividend to grow steadily in the future, it would probably be more efficient to use the dividend growth model. Here you would only need to estimate the growth rate in dividends, not the entire set of pro forma financial statements. Chapter 10 explains some techniques for estimating growth rates.

- 22.2 However, if a company is paying a dividend but is still in the high-growth stage of its life cycle, you would need to project the future financial statements before you could make a reasonable estimate of future dividends. Then, since you would have already estimated future financial statements, it would be a toss-up as to whether the total company model or the dividend growth model would be easier to apply.
- 22.3 Even if a company is paying steady dividends, much can be learned from the corporate value model, so many analysts today use it for all types of valuations. The process of projecting the future financial statements can reveal quite a bit about the company's operations and financing needs. Also, such an analysis can provide insights in to actions that might be taken to increase the company's value. This is called *value-based management*.

- 22.4 Even small changes in the size or riskiness of expected future dividends can cause large changes in stock prices. What might cause investors to change their expectations about future dividends? It could be new information about the specific company, such as preliminary results for an R&D programme, initial sales of a new product, or the discovery of harmful side effects from the use of an existing product, or, new information that will affect many companies could arrive. Given the existence of computers and telecommunications networks, new information hits the market on an almost continuous basis, and it causes frequent and sometimes large changes in stock prices. In other words, *ready availability of information causes stock prices to be volatile!*
- 22.5 If a stock's price is stable, that probably means that little new information is arriving. But if you think it's risky to invest in a volatile stock, imagine how risky it would be to invest in a stock which rarely released new information about its sales or operations. It may be bad to see your stock's price jump around, but it would be a lot worse to see a stable quoted price most of the time but then to see huge moves on the rare days when new information was released. Fortunately, in our economy timely information is readily available. Evidence suggests that stocks, especially those of large companies, adjust rapidly to new information. Consequently, equilibrium ordinarily exists for any given stock, and required and expected returns are generally equal. Stock prices certainly change, sometimes violently and rapidly, but this simply reflects changing conditions and expectations. There are, of course, times when a stock appears to react for several months to favorable or unfavorable developments, but this does not signify a long adjustment period; rather, it simply indicates that as more new pieces of information about the situation become available, the market adjusts to them. The ability of the market to adjust to new information is discussed in the next section.

23. The Efficient Markets Hypothesis

- 23.1 A body of theory called the **Efficient Markets Hypothesis (EMH)** holds (1) that stocks are always in equilibrium and (2) that it is impossible for an investor to consistently "eat the market".
- 23.1 The price of a stock will adjust almost immediately to any new development.
- 23.2 If markets are efficient, stock prices will rapidly reflect all available information. This raises an important question: What types of information are available and, therefore, incorporated into stock prices? Financial theorists have discussed three forms, or levels, of market efficiency.
- 23.3 **Weak-Form Efficiency.** The **weak form** of the EMH states that all information contained in past price movements is fully reflected in current market prices. If this were true, then information about recent trends in stock prices would be of no use in selecting stocks-the fact that a stock has risen for the past three days, for example, would give us no useful clues as to what it will do today or tomorrow.

People who believe that weak-form efficiency exists also believe that ape watchers” and “chartists” are wasting their time.

For example, after studying the past history of the stock market, a chartist might “discover” the following pattern: If a stock falls three consecutive days, its price typically rise 10 percent the following day. The technician would then conclude that investors could make money by purchasing a stock whose price has fallen three consecutive days.

23.4 **Semistrong-Form Efficiency:** The **semistrong form** of the EMH states that current market prices reflect all *publicly available information*. Therefore, if semistrong-form efficiency exists, it would do no good to pore over annual reports or other published data, because market prices would have adjusted to any good or bad news contained in such reports back when the news came out. With semistrong-form efficiency, investors should expect to earn the returns predicted by the SML, but they should not expect to do any better unless they have good luck or information that is not publicly available. However, insiders (for example, the presidents of companies) who have information which is not publicly available can earn abnormal returns (returns higher than those predicted by the SML) even under semistrong-form efficiency.

23.5 Another implication of semistrong-form efficiency is that whenever information is released to the public, stock prices will respond only if the information is different from what had been expected.

24. **Strong-Form Efficiency:** The **strong form** of the EMH states that current market prices reflect all pertinent information, whether publicly available or privately held. If this form holds, even insiders would find it impossible to earn abnormal returns in the stock market.

25. Implications of Market Efficiency

25.1 What bearing does the EMH have on financial decisions? Since stock prices do seem to reflect public information, most stocks appear to be fairly valued. This does not mean that new developments could not cause a stock’s price to soar or to plummet, but it does mean that stocks in general are neither overvalued nor undervalued—they are fairly priced and in equilibrium. However, there are certainly cases in which corporate insiders have information not known to outsiders.

25.2 If the EMH is correct, it is a waste of time for most of us to analyze stocks by looking for those that are undervalued. If stock prices already reflect all publicly available information, and hence are fairly priced, one can “beat the market” only by luck, and it is difficult, if not impossible, for anyone to consistently outperform the market averages. Empirical tests have shown that the EMH is, in its weak and semistrong forms, valid. However, people such as corporate officers who have

inside information can do better than the averages and individuals and organizations that are especially good at digging out information on small, new companies also seem to do consistently well. Also, some investors may be able to analyze and react more quickly than others to releases of new information, and these investors may have an advantage over others. However, the buy-sell actions of those investors quickly bring market prices in to equilibrium.

26. Preferred Stock

- 26.1 Preferred stock is *hybrid* – it is similar to bonds in some respects and to common stock in others. The *hybrid* nature of preferred stock becomes apparent when we try to classify it in relation to bonds and common stock. Like bonds, preferred stock has a par value and a fixed amount of dividends which must be paid before dividends can be paid on the common stock. However, if the preferred dividend is not earned, the directors can omit (or “pass”) it without throwing the company in to bankruptcy. So, although preferred stock has a fixed payment like bonds, a failure to make this payment will not lead to bankruptcy.

As noted above, preferred stocks entitle their owners to regular, fixed dividend payments.

WORKING OF DEPOSITORY SYSTEM INDIA

-- D.OBUL REDDY * and Shilpa Baid **

INTRODUCTION

Setting up of depository has been a milestone in the history of Indian Capital Market. Till just about a few years ago the suggestion of a trading and settlement system without the bane of bad deliveries was met with a cynical shrug, but not any longer. The introduction of Depository System would eliminate all the problems of bad deliveries, fake/forged and duplicate shares and delays in transfers which have hounded the Indian Capital market for years. This paper attempts to identify and analyze the role of depository system in Indian Capital Market. This paper covers the following aspects of the subject.

1. The need for Depository System in India.
2. Working of Depository System.
3. Benefits of Depository System.
4. Problems of Depository System.
5. Measures taken by the regulatory authorities to boost dematerialized trading.

NEED FOR DEPOSITORY SYSTEM IN INDIA

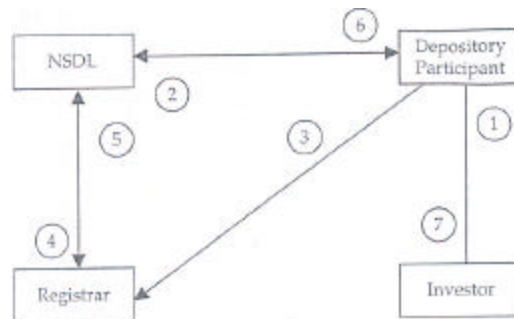
In the last 2 decades, the pace of growth in the Indian Capital Market has been almost unparalleled in the history of any nation. The extent of growth can be gauged from the fact that as against an annual average amount of just Rs.90 crores raised from the primary Market in 1970's Rs.27,000 crores were raised in mid 90's a spectacular rise of 300 times. In terms of market capitalization and turnover, India ranks among the top 15 Countries. It occupies second place in the world in terms of number of listed Companies next only to U.S. It has the largest number of Share-holders in the World. Paradoxically, with the increasing volumes the problems associated with trading and settlement system have also increased. Investor's have been haggling with delays associated with clearance and settlement, fraudulent, misappropriation, long drawn transfer procedure, enormous paper work, bad and improper delivery of stock, fear of wrong signature, stolen shares, forged shares, etc. Investors in India experienced unpleasantness to virtual cheating by company management in matters relating to listing of Securities, dispatch of allotment letters/ refund ordered, dispatch of securities, physical transfer of securities, transfer of odd lots, payment of dividends, payment of Interest on debentures, Rights to be withheld pending registration. With the passing of depository bill in July 1996 and formation of National Securities Depository Limited (NSDL), the Capital Market is all set to change its complexion.

WORKING OF DEPOSITORY SYSTEM

In India, Depository Ordinance paving way for the creation of depositories was promulgated by the Government in 1995, thereby facilitating scripless trading in capital market through dematerialization of securities. As per the regulations, equity shares,

debentures, warrants, bonds, units of mutual funds, rights under collective investment schemes and venture capital funds, Commercial paper Certificate of deposit, securised debt, Money Market instruments and unlisted securities are eligible to be admitted to the depository for dematerialization. A depository holds the Securities in electronic form. It can be called a Bank for Securities. It dematerializes the Securities, i.e., it converts the physical securities into book entry securities. In the process, physical Certificates are eliminated altogether. When an Investor deposits his physical securities with a depository, his account with the depository is credited for the deposit. The transfer is affected electronically whenever he buys and sells his shares and his account will be credited or debited accordingly. Shares in depository mode will be fungible; it means shares will have no distinctive number in case of shares physically held. The Institution which acts as a depository becomes the registered owner of the shares and the member owning the shares in a Company will be treated as beneficial owner. The beneficial owner continues to enjoy all the benefits like dividend, right shares, bonus shares, as well as voting rights. A depository interfaces with the investors with the help of a Depository Participant. A Depository Participant could be a public Financial Institution as defined in Section 4 A of Co's Act, 1956, Scheduled Banks, RBI approved foreign banks operating in India, State Financial Corporation established under Section 3 of State Financial Corporation Act, Institutions engaged in providing financial services, promoted by any of the institutions mentioned above, either jointly or severally, custodians of securities who are registered with SEBI, Clearing Corporation or clearing houses of Stock Exchanges, Stock brokers registered with SEBI, NBFC's having a net worth 50 lakhs or more, provided they fulfill the admission criteria laid down by SEBI. A Depository Participant is the representative of an Investor in the Depository System. He acts as an intermediary between an Investor and the Depository.

As per the provisions of the ordinance, the holder of securities shall have an option whether to remain in non-depository mode or shift to depository mode. Those who would like to remain in non-depository mode shall hold the physical possession of Certificates of Securities and the Investors who opt to hold securities under depository mode shall open an Account with a Depository Participant. He gets an identification number which serves as a reference point for all his transactions with that Depository Participant. The process of dematerialization involves the following steps:



1. The Investor has to fill up Demat Request Form provided by the Depository Participant and surrender his share Certificate duly cancelled by endorsing "surrendered for Demat".

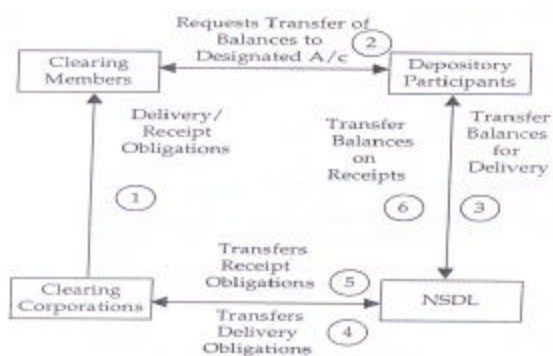
2. The Depository Participant sends an Electronic request to the Depository for dematerialization of Securities.
3. The Depository Participant forwards the Demat Request Form and the Certificates to the Registrar.
4. The Registrar confirms the request from the Depository and on certification of details will proceed to destroy the Certificates in the specified time frame.
5. The Registrar credits the depository account as registered owner in Company Books.
6. The Depository updates its accounts and confirms the dematerialization to Depository Participant.
7. The Depository Participant then credits the Investor's account with the number of shares so dematerialized and thereafter the Investor holds the securities in Electronic Form.

The Investor will be given a Pass book or Statement of holding which will be Dispatched to him periodically giving him his latest status. The Depository Participant will charge an Investor for the services offered. There are various types of fees: Account opening Fee, Custody Fee, Dematerialization Charges, Rematerialisation Charges, etc. These charges differ considerably from one Depository Participant to another.

An Investor can also exercise his option of holding shares in Electronic Form at the time of initial public offer. In that case, the Issuer shall inform the concerned Depository about the allotment of the securities and record the Depository as the registered holder of Securities. Having received such intimation, the Depository shall record the name of the allottee as the beneficial owner in its books.

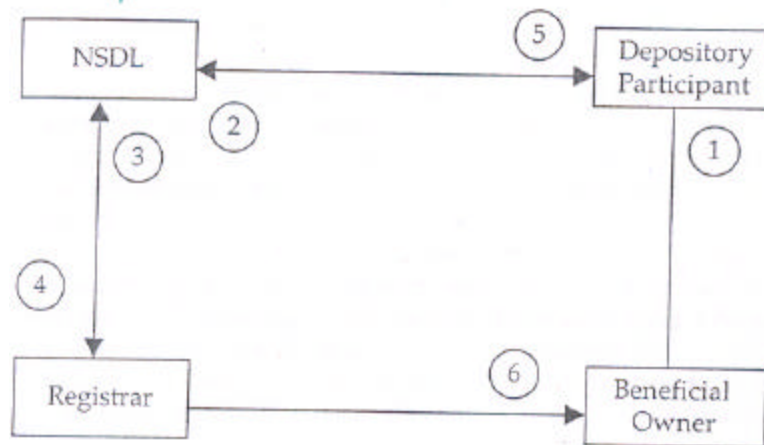
To settle account transfer with depository for trades, carried out on the exchange, the depository will interface with the clearing houses for delivery and receipt of obligations. Under the depository framework of settlement, depository will not transfer securities from delivering member to receiving member until the clearing house confirms that all funds have been received. The Settlement of funds will be outside the depository.

The following process flow outlines this clearing and settlement procedure:



Depository ordinance also provides to the beneficial owner the facility of converting electronic holding into share certificates. For rematerialisation the beneficial owner has to request his Depository Participant for rematerialisation of shares. The concerned Company will issue new Share Certificates to the Investor for the shares so rematerialized.

Rematerialisation takes place through the following steps:



1. Beneficial owner requests for dematerialization.
2. Depository participant intimates NSDL of the request through the system.
3. NSDL confirms dematerialization request to the registrar.
4. Registrar updates accounts and prints certificates.
5. NSDL updates accounts and download, details to depository participant.
6. Registrar dispatches certificates to investor.

Multiple Depository Concepts

In India the concept of multiple depositories has been adopted. Given the fact that India has the largest number of shareholders in the World it is reasonable to assume that dematerialization can take place at a faster pace if there are multiple depositories. It also creates a competitive environment which will be responsive to the user's interest and demands.

National Securities Depository Limited (NSDL), the first depository and the only player in the market so far was registered with SEBI on 7th June, 1996. It started its operations on 8th November, 1996. Since then it has been growing at a faster pace. It is a public limited company incorporated under the Company's Act. It is promoted by UTI, IDBI, NSE and SBI.

The Bombay Stock Exchange and Bank of India have jointly promoted the second depository in the country, Central Depository Services (India) Limited (CDSL), for dealing in securities in the electronic form. SEBI granted the certificate of registration to CDS on 19th August, 1998. Very soon it will become operational.

BENEFITS OF DEPOSITORY SYSTEM

Though the Depository System is optional and it is left to the Investor to decide whether he wants the Securities to be dematerialized or not, the number of Accounts with NSDL is increasing day by day. Large quantity of securities is being dematerialized by mutual fund, foreign investors and domestic investors because of the advantages of holding Shares in electronic Form.

1. A Depository first and foremost ensures that only preverified assets with good title are exchanged in the process of trading. So and investor is assured of good quality of assets. Besides this, the problems of bad deliveries and all risks associated with physical certificates, such as loss, theft, mutilation, etc., would be eliminated.
2. Electronic transaction of securities eliminates the time consuming paper work involving Certificates and Transfer Deed.
3. Instant transfer of securities due to quick processing enables one to get dividend, right and bonus without delay.
4. The transaction costs are drastically reduced because of no stamp duty on transfer.
5. No problem of odd lots hereafter the marketable lot in depository is fixed as 1 share.
6. All non-cash corporate benefits, i.e. rights and bonuses can also be obtained in electronic form automatically.
7. As a Security measure, the Account Holder can totally freeze his Account for any desired time duration.
8. Loans against pledge or hypothecation of dematerialized share can be borrowed at a lower interest rate.
9. Depository makes it possible for Investors to be able to deliver shares in any part of the Country without exposing themselves to the risk and cost of transportation. Intermediaries will be benefited from enhanced liquidity, safety and turnover on stock market, improved cash flows from not having funds tied up for long periods, elimination of forgery and counterfeit with attendant reduction in settlement risk from bad deliveries.

This system will also help Company Management to maintain and update information about shareholding pattern of Company. The issue cost will also be drastically reduced because of dematerialization of shares. It can be inferred that paperless trading is a boon not only for investors and brokers, but other intermediaries and Company Management will also be benefited.

PROBLEMS OF DEPOSITORY SYSTEM

Despite the various benefits the Depository System offers, Investor especially the retail investor is shy of Demat trading. In order to provide an investor friendly

market-oriented system of paperless settlement of securities transactions various issues needs to be addressed:

- (1) The issue which is keeping the Retail Investors away from the depository system is the agency risk. As far as the retail investor is concerned, the risk perception in the new system is no less (if not more) than what it is in the present system of trading and settlement. Infact in the present system his risk is diversified among various player (Brokers, Registrar, Postal System etc.) and limited in scope while in the proposed system all eggs would be in 1 basket, i.e., the Depository Participant. Even if the Depository Participant is a reputed Bank, the retail Investor does not feel confident until adequate and effective insurance coverage is provided.
- (2) Cash benefits cannot be disbursed electronically. They will be sent by Post, so the risk of loss in transit still has to be borne by the Investor.
- (3) There are charges for account opening, dematerialization, rematerialisation, etc., Besides this, Investors who intends to hold their investment in dematerialization form have to pay custody charges to the Depository Participant. All this may deter retail investors from taking advantage of the System.
- (4) The option to the existing shareholders not to opt for depository system may keep many securities in Physical Form. Statistics show that in India almost 40% of the shares are not sold. Indian shareholders may not like to part with their shares for a mere Computer entry purely out of sentimental reason.
- (5) A large number of transactions are not accounted for and both the buyers and sellers may not be comfortable with their names appearing in Computer Printouts. The fear of Tax Authorities may outweigh the disadvantages of the time consuming transfer facilities.
- (6) The Infrastructure available for trading in Demat shares is thoroughly inadequate. Even in some of the major towns it is difficult to open a Demat account, it is practically impossible for those living in smaller towns. All these Investors along with their funds will be driven out of the market if trading in Demat shares is made compulsory.

MEASURES TAKEN BY THE GOVERNMENT TO BOOST DEMAT TRADING

In order to attract more and more Investors towards Depository System, the Government, Reserve Bank of India, SEBI, and NSDL have taken several measures:

1. Public awareness programmes have been launched to enhance awareness among market participants especially Investor's and Traders, about the benefits Of holding and trading shares in Demat form.

To encourage retail Investors to invest in Demat equity/debt, R.B.I has decided to increase the ceiling to Rs.20 lakhs if the advances are secured by Demat shares. The minimum margin required against such shares has been reduced to 25%.

Demat equities are allowed as “good delivery” in the physical trading from April 6. An Investor purchasing shares in the physical segment may get delivery in Demat shares and such shares will be good delivery.

In order to boost trading volume in the Demat segment, SEBI has made it compulsory for Institutional Investors to trade in Demat form in respect of 110 scrips from October 15, 1998. Starting December 15, 1998 trades by Institutional Investors in 235 scrips have to be settled compulsorily in Demat form.

To rope in small Investors SEBI has come up with a list of 12 companies in which retail Investors have to compulsorily settle trades in Shares in Demat form from January 4, 1999. With effect from February 15, 1999 nineteen Companies have been added to the list of securities in which trading in Demat form is compulsory for all Investors. From April 5, 1999 another 29 companies have to be traded in Demat form compulsorily by all investors. So from April 5, 1999 investors would have to deal in Demat form in 60 scrips compulsorily. This will cover all scrips of BSE Sensex and CNX Nifty indices.

Depository participants are offering a number of special incentives like Waiver of Account Opening Charges, Security Deposit, Maintenance charges and reduction in transaction cost, etc., to woo the prospective clients.

NSDL intends to facilitate in the near future stock lending and borrowing of Securities held in Demat form, stock lending and borrowing schemes would give a major fillip to trading volumes in the Demat shares.

The measures taken so far indicate the eagerness of the regulatory authorities to promote Demat trading. Since retail Investors have the key to liquidity, there is a concerted move to reach out to small Investors by offering them various sops.

CONCLUSION

Setting up of depository is a bold step and a beginning is made towards integrating Indian capital market with the rest of the International Markets. While depository system by itself may not be a panacea for the antiquated forms of trading and methods of record keeping which are manual, cumbersome and time consuming it may definitely improve the capital market operations.

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NG UNIT -IV

CAPITAL MANAGEMENT

[Instructions to Faculty]

Administrative Training Institute
Lalithamahar Road, Mysore - 570 011

Learning Unit-4

Instructions to Faculty

Capital Management

First, explain the objectives of this Learning Unit.

Objectives:

At the end of this Learning Unit the participants will be able to:

1. Understand the nature of investment decisions.
2. Value the estimated future benefits that will occur to the firm over a series of years.
3. Understand the implications of long-term investments.
4. Apply the steps of investment evaluation criteria methodically.
5. Work out to accept or reject an investment proposal.
6. Use pay back period as a method of evaluating investment proposal.
7. Evaluate both the lending and borrowing type projects.
8. Build the relationship between profitability and risk.
9. Describe basic risk concepts.
10. Incorporate risk analysis in the capital budgeting proposals.
11. Apply different approaches to the calculation of cost of equity capital.
12. Adopt CAPM approach for computing the cost of equity.
13. List merits and demerits of the CAPM approach.
14. Calculate weighted average cost of capital.
15. Determine the cost of equity capital of the company.
16. Establish the relationship between leverage and the cost of capital.
17. Critically appraise the traditional approach and the Modigliani- Miller approach to the problems of capital structure.
18. Establish the relationship between capital structure and the value of firm.
19. Define capital structure, appropriate capital structure and flexible capital structure.
20. Employ yield measures like, current yield, yield to maturity, yield to call and realized yield to maturity.
21. Undertake stock valuation by using dividend discount model.
22. Understand the DEMAT systems and the working of depository system in India.

ty should use the visual aids given below to explain the objectives.

Visual Aid - 25: Capital Management

Capital Management

- Capital Structure
- Capital Budgeting Decisions
- Measurement of Risk
- Cost of Capital including CAP-M
- Valuation of Fixed Income Securities
- Valuation of Bonds and Stocks

Explanation: Faculty to give the salient features of each of the above units while making the presentation. Faculty may refer to the information in the Reading Material for Learning Unit 4.

Visual Aid – 26: Capital Structure

Capital Structure

- Debt and Equity
- Financial Leverage
- Modigliani-Miller Theory
- Trade Off Analysis
- Signaling Theory
- Hamada Model

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation/

Visual Aid - 27: Capital Budgeting Decisions

Capital Budgeting Decisions

- Investment in long term assets.
- Capital budgeting evaluation
- Pay back period
- NPV and IRR.
- Profitability Index
- Post audit

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation/

Visual - Aid 28: Measurement of Risk

Measurement of Risk

- Forecasting risk
- Risk and returns
- Risk adjusted discount rate
- Sensitivity analysis
- Standard deviation to measure risk
- Decision Tree approach
- Utility Theory

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation

Visual Aid – 29: Cost of Capital, including CAP-M

Cost of Capital, including CAP-M

- Measurement techniques of cost of capital
- Wealth maximization approach
- Explicit and Implicit costs
- Debt financing
- Weighted average cost of capital
- Capital Asset Pricing Model
- Rationale of CAP-M

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation

Visual Aid - 30: Valuation of Fixed Income Securities

Valuation of Fixed Income Securities

- Preference shares
- Convertible debentures
- Non-convertible debentures
- SEBI guidelines
- Government securities
- Yield to maturity
- Credit Ratings
- Liquidity Preference Theory
- Determinants of Interest Rate

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation

Visual Aid - 31 -Valuation of bonds and stocks

Valuation of bonds & stocks

- Classification of bonds: based on return and risk
- Sinking funds
- Bond yields:
 - yield to maturity
 - yield to call
 - current yield
- Interest rate risk
- Reinvestment Rate risk
- Basis for bond ratings
- Stocks and their valuation
- Common stock market and valuation
- Dividend growth models
- Efficient markets hypothesis

Faculty may refer to the Reading Material in Learning Unit 4 for information on the above topics for presentation

Group Activities

After making a presentation based on the above visual aids Nos. 25 -31, faculty should facilitate group activities as detailed in the handout on Group Activity for Learning Unit 4. Briefly, there will be three groups; each group will be assigned work as follows:

- | | |
|----------|---|
| Group 1: | A. Capital Structure
B. Capital Budgeting decision |
| Group 2: | C. Measurement of Risk
D. Cost of Capital, including CAP-M |
| Group 3: | E. Valuation of Fixed Income Securities
F. Valuation of Bonds & Stocks |

Also detailed in the handout on Group Activities for Learning Unit -4 is a list of 24 questions. Faculty should facilitate participants to seek solutions to the 24 questions, in addition to the group task assigned as above.

Government of Karnataka

TRAINING MODULE ON
**CORPORATE
FINANCE MANAGEMENT**

[Non-DLM]

[20 days Training Module in two phases of 10 days each:
Refined after the validation proceedings]

Phase-II

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And

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Phone(0821) 443264, 443839, Fax: 523899

e-mail: dgatim@yahoo.com

Contents

- 4. Portfolio Management
- 5. Derivatives
- 6. International financial Management

{Note: The Second Phase Training is meant for the participants, who have undergone training in the first phase}

Module for Phase – 2

Day-I Introductory activities

Forenoon & Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 to 10.30 a.m.	Registration for the participants of Phase-2 training at ATI Hostel.	
10.30 a.m. to 1.45 p.m.	<p>Detailed re-cap on Phase-1 training. Presentation by the four groups on each of the following learning units of phase-1.</p> <ul style="list-style-type: none"> • Basics of Commercial Accounting and Balance Sheet • Discounted Cash Flow Technique and Internal Rate of Return • Budget • Capital Management 	
2.30 pm to 5.30 pm	<ul style="list-style-type: none"> • Expectations of the participants from phase-2 training and its analysis • Briefing on the objectives and the utility of phase 2 training • Distribution of reading materials and group activities related to the Phase- 2 Learning Units • Visit to the Library to collect books and journals on topics incorporated in Phase-2 Learning Units. <p>Summing up of the proceedings of Day-1.</p>	<ul style="list-style-type: none"> • Facilitator to analyze the expectations of the participants. • Facilitators to explain the salient features of the phase-2 training. • Facilitator to explain how to use the reading materials and books to carry out the group activities effectively. • Facilitator to assist the participants in the selection of books.

Portfolio Management

Objectives :

At the end of this learning unit, the participants will be able to;

- Interpret the basic principles required for designing, analyzing and managing a portfolio
- Forecast the future share price movements
- Identify the factors that influence financial performance of companies.
- Decide the proportions of the total funds that should be invested in each security.
- Take decisions on asset allocation and on the choice of securities within each broad category of asset.
- Revise portfolios based on changes in the prices of securities.
- Evaluate portfolio performance.

Day - 2
Learning Unit - 5

Forenoon & Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on the proceedings of Day-1.	
	Commencement of LU-5	
Portfolio Management	Faculty to initiate the session with a brief presentation on stock exchange, technical analysis and charting of stock prices; modern portfolio theory; asset allocation and portfolio design and evaluation of portfolio performance.	Faculty/facilitator may use the 10 visual aids specified in the handout on 'Instructions to Faculty on Portfolio Management' in LU-5.
	<div style="border: 1px solid black; padding: 2px; text-align: center;">Group activities</div>	
	Four groups will be formed. Groups will be assigned the following topics:	The focus for discussion should be on the points specified in the handout for Group Activities in Learning Unit-5.
Assignment of topics	<p>Group 1: Firm specific analysis</p> <p>Group 2: Modern Portfolio theory</p> <p>Group 3: Asset allocation and portfolio design.</p> <p>Group 4: Evaluation of portfolio performance.</p> <p>Participants to develop visual aids for the presentations.</p>	<p>Reading material on the topics for group discussion will be made available to the participants in advance. Each participant will be required to study the material for participation in group discussion on financial issues, detailed calculations, implications and decisions.</p> <p>Faculty may ask the participants to ignore the difficult mathematical portions.</p>

Day-3
Learning Unit-5

Forenoon and Afternoon Session

	<ul style="list-style-type: none"> ▪ Re-cap on the day-2 proceedings ▪ Group Activities on Learning Unit-5 will continue for the entire day ▪ Summing up of the day-3 proceedings. 	
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Day-4
Learning Unit - 5

Forenoon and Afternoon Session:

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on the proceedings of Day 2 and 3	
Firm specific analysis	Presentation by the group 1 on 'Firm specific analysis' plenary discussion by participants and moderation by Faculty.	
2 Modern Portfolio theory	Presentation by the Group 2 on 'Modern portfolio theory';	
Asset Allocation and Portfolio Design	Presentation by Group 3 on 'Asset allocation and portfolio design' Presentation by Group 4 on 'Evaluation of, portfolio performance'. Plenary discussion by participants and moderation by faculty. Listing of learning points arising from the presentations and discussions. Summing up by Faculty	

Derivatives

At the end of this learning unit, the participants will be able to:

07. Understand the rationale of risk management.
08. Understand the background on derivatives.
09. Understand option theory.
10. Use complex option pricing model and the Black-Scholes model.
11. Understand forward contracts, futures and swaps.
12. Use derivatives to reduce risks.

Day 5
Learning Unit - 6

Forenoon and Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m. Derivatives	<div>Commencement of LU-6</div> <p>Recap on L.U.5.</p> <p>Faculty to make a brief presentation on the meaning and background of derivatives as well as option pricing models including the black schales option pricing model and using derivatives to reduce risk.</p>	<p>As this is a new subject, every care should be taken to explain basic definitions with simple examples.</p> <p>Faculty may use the 7 visual aids indicated in the handout “Instructions to Faculty” in LU-6.</p>
Group tasks	<p>All groups will be asked to read the key concepts and case studies on derivatives provided in the reading material in LU-6 and to respond to the questions following the material.</p> <p>Summing up of the 5th day proceedings.</p>	

Day 6
Learning Unit - 6

Forenoon and Afternoon Session

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m. Recap Derivatives Focus on questions and mini cases	<p>Recap of the proceedings of Day 5.</p> <p>Group activities contd.</p> <ul style="list-style-type: none"> • All groups will have to go through the reading material and/or available books related to this topic. • Participants will be supplied with reading materials and brief summary on derivatives. • After studying the material provided, each group will be expected to answer the questions following the reading material and the two mini cases (as per details in the handout 'group activity on derivatives' in LU-6). • Participants to develop visual aids to do the presentation. 	<p>Explain the importance of questions and mini cases</p>
	Summing up of the proceedings of Day 6.	

Day 7
Learning Unit - 6

Forenoon and Afternoon Session

9.30 a.m. to 5.30 p.m.	<ul style="list-style-type: none">▪ Recap on the 6th day proceedings.▪ Presentations, discussions, moderation and listing of learning portion.▪ Summing up of the proceedings of Day 7.	Moderation and summing up
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Learning Unit - 7

International Financial Management

Objectives: -

At the end of this learning unit, the participants will be able to:

10. Prepare statements of balance of payments.
11. Acquire the skills of conversion rates, by bid price, ask price and spread
12. Workout the arbitrage possibilities.
13. Calculate expected exchange rate.
14. Understand the various exchange rate theories.
15. Work on 'covering exchange rate risk' with reference to appreciation, depreciation, hedging and translation exposure.
16. Calculate the interest rate risk under different situations.
17. Recommend regarding procurements, manufacturing and viability based on the case studies.
18. Understand the financial systems in the Euro currency market.

Day 8
Learning Unit - 7

Forenoon and Afternoon Sessions

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 5.30 p.m.		
Recap	Recap on L.U. 6.	
	Commencement of LU 7 International Financial Management.	
International Financial Management	Faculty to make a brief presentation on BOP, exchange rate theories, hedging and translation exposure, currency adjustment, IMF and IBRD functions, EMS, Foreign exchange market, Euro currency market and risks in international operations.	Faculty to use the visual aids indicated in the handout “Instructions to Faculty” in LU 7.
	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Group activity:</div> <ul style="list-style-type: none"> • Group work will be assigned to the existing 4 groups. • Participants will be required to read/ study the reading materials in LU 7 and to use references to solve specific problems. • 15 problems and 2 case studies will be supplied to the participants (the details are available in the handout on ‘group activities’ in LU-7) 	
Focus on 15 problems and two cases		
Case on guns	As far as the case studies are concerned, the groups must make specific recommendations about the manufacture and purchase of guns, and hiring or purchasing of helicopters along with financial implications.	
Case on helicopters.	Groups will develop visual aids for presentations.	
	Summing up of the 8 th day proceedings.	

Day 9
Learning Unit - 7

	<ul style="list-style-type: none">▪ Recap on the 7th day proceedings▪ Group activities on L.U. 7 will continue on day 9.▪ Summing up of the Day 9 proceedings.	
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Day 10
Learning Unit - 7

Forenoon and Afternoon Sessions :

Time & Subject	Activities/Process	Support and Role of Facilitators
9.30 a.m. to 1.30 p.m. Recap International Financial Management Presentation	Recap on the proceedings of Day 9. Presentations, discussions, moderations listing of learning points and summing up.	Moderation and summing up
2.30 p.m. to 5.30 p.m. Conclusion	Summing up of LU-7 by the participants. Internal evaluation/good byes	

LEARNING UNIT – V

PORTFOLIO MANAGEMENT

[Group Activity]

Administrative Training Institute
Lalithamahar Road, Mysore – 570 011.

Portfolio Management

1. General Instructions:

- 1.1. Portfolio management is one of the new techniques to reduce risk in security investments.
- 1.2. At the beginning of this learning unit, the faculty will make an explanation on Portfolio Management with examples. This explanation/presentation will take approximately two hours.
- 1.3. After the explanation/presentation, participants may raise questions for further clarifications or issues for discussion on the subject of Portfolio Management. Approximately 45 minutes time has been earmarked for this discussion.
- 1.4. This will be followed by another detailed explanation by the faculty on group activities to be carried out by participants.

2. Group Work

- 2.1. Four groups will be formed. Each group will consist of 5-6 members. Each group will be assigned a separate topic as shown below :-

Group A : Firm specific analysis.
Group B : Modern Portfolio theory
Group C : Asset Allocation and portfolio design.
Group D : Evaluation of portfolio performance.
- 2.2. Each participant is expected to go through the reading material on the above topics to discuss financial issues, meanings and definitions, calculations, implications, decisions etc., Further they will also be expected to list out the important points on flip charts/ Power point/OHP for presentation.
- 2.3. One or two members from the group may make the presentation. Each group will be given sufficient time followed by 15 minutes discussion in the classroom with other group members.
- 2.4. The presentations and the discussion will be moderated by the faculty members.

3. Material for presentation by Group A:

Firm Specific Analysis

(source : Book on PortFolio Management by Professors. S.K.Barua, and V.Raghunathan and J.R.Verma)

- 3.1. If we want to know how prosperous a person is, we generally look at his income and wealth. A person who is very wealthy can live off his capital for several years even if his current income is low. So also a person who has a high level of income may be able to live well even if he has little wealth or is encumbered with substantial liabilities. Similarly, when we look at the financial health of a company, we must look at its assets and at its income.
- 3.2. The financial statements published by a company periodically (typically once a year) allow us to do precisely that. The two basic financial statements provided by a company are the Balance Sheet and the Profit and Loss Account (P & L Account for short). The first gives us a picture of the assets and liabilities of the company while the second gives us the details of its earnings. We shall now look at each of these statements in greater detail.
- 3.3. The Balance Sheet is a snapshot of what the company 'owns', the assets, and what the company 'owes', the liabilities, on a specific date. We have below the condensed Balance Sheets as on 31.03.1990 and 31.03.1991 of Shatabdi Industries, in the format used by the Bombay Stock Exchange (BSE) Directory. (The published Balance Sheet, from which these condensed statements have been prepared, contains hundreds of items.)

TABLE 1: Balance Sheet of Shatabdi Industries Ltd.

		Rs. In Lakhs		Common size	
		31.03.1990	31.03.1991	31.03.1990	31.03.1991
A	Current Assets	20181	28437	42	49
	1. Cash and Bank Balance	1737	1655	4	3
	2. Sundry Debtors	6883	8770	14	15
	3. Inventory	8135	9180	17	16
	4. Misc. Current Assets	3426	8833	7	15
B	Fixed Assets (Net)	28225	29135	58	51
	5. Gross Block	48640	53772	100	93
	i) Plant & Machinery	40228	44965	83	78
	ii) Others	8411	8812	17	15
	6. Less: Depreciation	20415	24637	42	43
C	7. Investment in Subsidiaries				
D	8. Miscellaneous Assets	10	10	0	0
E	9. Intangible Assets	17	17	0	0
	Total Assets	48432	57598	100	100
F	Current Liabilities	14586	13808	30	24
	10. Loans and Advances	4368	2008	9	3
	11. Sundry Creditors	6196	6907	13	12
	12. Provision for Tax	1534	3704	3	6
	13. Miscellaneous Current Liabilities/Provisions.	2487	1189	5	2
G	Deferred Liabilities	14565	19999	30	35
	14. Debentures	5948	8397	12	15
	15. Long-term Loans	8617	11602	18	20
	Total Outside Liabilities	29151	33807	60	59
H	Share capital	1863	1863	4	3
	16. Preference Capital			0	0
	17. Equity Capital (Rs.10 paid up)	1863	1863	4	3
I	Shareholders' Reserves	17418	21928	36	38
	18. Share Premium Reserve			0	0
	19. Other Capital Reserve	4514	4248	9	7
	20. Sinking Fund and Redemption Reserve	560	1120	1	2
	21. Investment Allowance Reserve	5315	5765	11	10
	22. Free Reserves/Surplus	7029	10795	15	19
	Net Worth	19282	23792	40	41
	TOTAL LIABILITIES	48432	57598	100	100

- 3.4. The major categories of assets are current assets and fixed assets. Current assets are those assets which the company intends to convert into cash in the near future (within say less than one year). Fixed assets are those assets which the company intends to use up over several years. The major categories of liabilities are outside liabilities and liability towards shareholders, known as net worth. Accountants treat a company as an entity distinct from its shareholders whose stake in the firm is therefore treated as a liability of the company towards its shareholders. The outside liabilities are usually categorized into those which have to be met in the near future (say within the next one year), which are known as current liabilities and those liabilities which have to be met later, known as the long term liabilities.

4. Net Worth and Book Value

- 4.1. A shareholder's stake in the firm is divided into shareholder's capital and reserves. It can be observed from Table 5.1 that there are several kinds of reserves. The share premium reserve is the amount paid by the shareholders in excess of the par value of the shares. The shareholders capital and the share premium reserve together represent the total amount of money provided by the shareholders to the firm. The free reserves are the past profits retained by the firm; these are available for distribution as dividends. Both the share premium and the free reserves can be used by the company for issuing bonus shares. The other kinds of reserves, created for specific purposes, are not available for paying dividends and issuing bonus shares. However, these reserves when no longer needed can be transferred to free reserves.
- 4.2. The total net worth divided by the number of shares is the much talked about book value of a share. For Shatabdi Industries, the book value turns out to be Rs.127.70 on 31.03.1991 as against Rs.103.50 on 31.03.90. Though the book value is often seen as an indication of the intrinsic worth of the share, this may not be so for two major reasons. First, the market price of the share reflects the future earnings potential of the firm which may have no relationship with the value of its assets. Second, the book value is based upon the historical costs of the assets of the firm and these may be gross underestimates of the cost of the replacement or resale values of these assets. It is not uncommon to find shares of good companies quoting five to ten times their book value.
- 4.3. We now turn to the Profit and Loss Account of Shatabdi Industries given in Table 2.

TABLE 2: Profit and Loss Account of Shatabdi Industries Ltd.,

		Rs. In Lakhs Year ending		Common size Year ending	
		31.03.1990	31.03.1991	31.03.1990	31.03.1991
A	1. Net Sales	51929	61527	100	100
B	Cost of Goods Sold	35105	40002	68	65
	2. Stocks Consumed	8809	9292	17	15
	3. Wages and Salaries	5239	6182	10	10
	4. Direct Manufacturing Expenses	21057	24527	41	40
C	5. General Expenses	6511	7540	13	12
D	6. Gross Profit	10313	13985	20	23
E	7. Interest	2293	2428	4	4
F	8. Pre-Depreciation Operating Profit	8021	11558	15	19
G	9. Depreciation	3972	4222	8	7
H	10. Operating Profit	4049	7335	8	12
I	11. Non-Operating Surplus/ Deficit	169	277	0	0
J	12. Pre-tax Profit	4218	7612	8	12
K	13. Provision for Taxes	728	2170	1	4
L	14. Net Profit	3489	5442	7	9
M	Profit Distributed	745	932	1	2
	15. Dividend on Preferred Capital				
	16. Dividend on equity	745	932	1	2
N	17. Profit Retained	2744	4510	5	7

- 4.4. The Profit and Loss Account shows the revenues earned and the costs incurred by the company during the years ending 31.03.1990 and 31.03.1991. The costs are classified into major heads. The *Gross Profit* as defined by *BSE*, commonly known as Earnings Before Interest, Depreciation and Taxes (EBIDT), is arrived at by subtracting the Cost of Goods Sold and the General Expenses from Sales Revenues. The Operating Profit as defined by *BSE* more commonly known as Profit Before Tax (PBT) is arrived at by subtracting Interest and Depreciation Expenses from the Gross Profit. The Net Profit or Profit After Tax (PAT) is arrived at by subtracting the Taxes Paid from the total of Operating and Non-operating Profits. The P&L Statement also shows the details of distribution of net profits between dividends and retention.

- 4.5. There are some other measures of earnings which are frequently used for various kinds of analyses. Earnings Before Interest and Taxes (EBIT) is obtained by subtracting depreciation from EBIDT. Cash Profits are defined as PAT plus all non-cash expenses, primarily depreciation.
- 4.6. Most investors are interested in the Earnings Per Share (EPS) which is obtained by dividing PAT by the number of shares. In case of Shatabdi Industries, EPS for 1991 is Rs.29.22 as compared to Rs.18.73 in the previous year.

5. Sources and Uses of Funds

- 5.1. The identification of sources and uses of funds is known as Funds Flow Analysis. We shall regard funds and cash as synonymous for our discussion. Cash can be generated by retaining profits rather than paying them out as dividends, selling existing assets, borrowing money or raising money from shareholders by issuing new securities. Cash is used to purchase assets or pay off debt. The starting point for drawing up a funds flow statement is to compute the changes in each Balance Sheet item from one statement date to the next, and classify them using the following scheme.

	Increase	Decrease
Asset	Use	Source
Liability	Source	Use

- 5.2. While doing this we must look at the changes in the Gross Block rather than the Net Block because this correctly captures the additions to and sale of fixed assets.
- 5.3. Once this has been done, there is only one important source of funds left. This is the Cash Profits generated by the firm which as stated earlier is PAT plus all non cash expenses. The Statement of Sources and Uses of Funds for Shatabdi Industries for the year ended 31.03.1991 is contained in Table 3.

TABLE 3: Sources and Uses of Funds for Shatabdi Industries Ltd.

Sources of Funds		
Deferred Liabilities		5434
Debentures	2449	
Long Term Loans	2985	
Internal Generation		9664
Profit after Tax	5442	
Depreciation	4222	
		15098
Uses of Funds		
Increase in Current Assets		8256
Decrease in Current Liabilities		778
Increase in Gross Block		5132
Dividends		932
		15098

- 5.4. One of the major uses of Funds flow Analysis is to find out whether the firm has used short term sources of funds to finance long-term investments. Such method of financing increases the risk of liquidity crunch for the firm, as long-term investments, because of the gestation period involved may not generate enough surpluses in time to meet the short-term liabilities incurred by the firm. Many a firm has come to grief because of this mismatch between the maturity periods of sources and uses of funds.
- 5.5. It is clear from Table 3 that Shatabdi Industries has been quite prudent in its choice of source mix. A large proportion of total funds have come from long-term sources, which has not only been used to finance the long-term uses but also to finance current assets and reduce current liabilities.
- 5.6. The Funds Flow Analysis also reveals the extent to which a company is able to finance its growth from Internal Generation of funds. In Table 3, we see that in the case of Shatabdi Industries, internal generation accounts for about two-thirds of the total requirements of funds.

6. Cross-sectional and Time Series Analysis

- 6.1. One of the main purposes of examining financial statements is to compare two firms, compare a firm against some benchmark figures for its industry and to analyse the performance of a firm over time. This kind of comparison becomes difficult if it is done on the basis of the figures reported in the annual statements. For example, can we say that a firm with long-term loans of Rs.50 crores is more risky (because of higher leverage) as compared to a firm with long-term loan of just Rs.4 crores? A correct assessment would require that we reflect the relative size of the firms in our comparison.

The techniques that are used to do such proper comparative analysis are: (i) common-sized statement, and (ii) financial ratio analysis.

- 6.2. The common-size statement is prepared by expressing the items in the Balance Sheet as percentages of total assets and the items in the P & L Account as percentages of sales. The last two columns of Table 1 show common – size statement for Shatabdi Industries. Once common-size statements are prepared, straight comparison between two firms or between a firm and industry averages is possible.
- 6.3. Financial ratio analysis is perhaps the most extensively used tool for comparative analysis. The ratios which are useful for carrying out such comparison depend upon the purpose of the analysis. For example, short-term creditors would be interested in monitoring ratios that reflect the ability of the firm to meet its short-term liabilities, while long-term creditors and share-holders would in addition be interested in ratios that measure the long-term performance of the firm. There are broadly four types of ratios that are used for analyzing the performance of a firm :
 1. **Liquidity ratios** measure the firm's ability to fulfill its short-term obligations.
 2. **Leverage/Capital structure ratios** measure the firm's ability to meet its short-term as well as long-term debt obligations.
 3. **Turnover/Activity ratios** measure how effectively the firm is using its assets.
 4. **Profitability ratio** measure the return on sales and assets of the firm.
 5. **Common stock ratios** measure dividends, earnings and net worth on a per share basis.
- 6.4. The reader is encouraged to evaluate Shatabdi Industries by computing and interpreting the ratios defined in the Appendix. The authors' summary evaluation of the company is as follows :

Despite a substantial improvement in the performance of Shatabdi Industries in 1991, the profitability ratios continue to be mediocre. Though the profit margin on sales is good, low asset turnover ratios have led to a low return on capital employed. Closer analysis reveals that the turnover of current assets is reasonably good and the low asset turnover ratio is due to fixed assets being large in relation to sales. Shatabdi Industries has followed very conservative financial policies as reflected in the high current ratio of over 2, a relatively low long-term debt to equity ratio of 0.84 and a good interest coverage ratio of over 4. The company has also been conservative in rewarding the shareholders. The payout ratio is less than 20%. The large free reserves in relation to paid-up capital indicate that the company is ripe for a bonus issue. In

sum, Shatabdi creditors should love the company, but its shareholders would prefer a far more aggressive financial policy.

It is quite likely that all our readers may not fully agree with our evaluation of Shatabdi Industries. The interpretation of ratios involves a fair amount of judgment and subjectivity. A ratio can rarely be interpreted in isolation, as its significance has to be judged in relation to the other ratios for the firm. The impacts of accounting policies of the firm must also be taken into consider action as explained later in this chapter.

Break-even and Contribution Analysis.

Break-even analysis deals with the relationship of profits with costs, price and the level of output. As the name indicates, it is centered on the concept of that level of output at which the firm makes no profit or loss, that is, it just breaks even. The analysis requires identification of Fixed and Variable costs of production; the Fixed Costs being those costs that do not vary with the volume of output, while the Variable Costs are those costs that vary linearly with the volume of output. The typical examples of variable costs are raw material cost, sales commissions, etc. A moment's reflection makes it clear that many costs cannot be fitted into just these two categories, as they are semi-variable in nature. The costs of maintenance, the costs of stores and spares, the cost power, etc. fall in this category. For such costs, judgment based on the process of production may have to be used to decide what proportion of the cost may be regarded as fixed (the balance being variable).

Since the annual financial statements do not present costs classified into fixed and variable, we have to examine the details given in the schedules contained in the annual report to arrive at the proportion of fixed and variable costs. It is obvious that condensed statements of the kind published in the BSE Directory will be absolutely inadequate for such an analysis.

In the case of Shatabdi Industries, we looked at the detailed annual report and identified the variable and fixed expenses. In terms of Table 2, Stock Consumed is fully variable. After examining the items of cost that comprise Direct Manufacturing Expenses we concluded that 60 % of this expense can be regarded as variable. All other expenses are fixed in nature.

Using this information, we can recast the P&L Account of Shatabdi Industries as follows:

Sales	61527
Less: Variable expenses	24008
Contribution	37519
Less Fixed costs	30184
Add Non-operating surplus	277
Profit before tax	7612

In break-even analysis, we are interested in determining the level of sales at which the Profit before Tax (PBT) is zero. We will do this by working our way backwards in the above table setting the last row (PBT) equal to zero.

We begin with the relationship

$$\text{PBT} = \text{Contribution} - \text{Fixed Costs} + \text{Non Operating Surplus}$$

When PBT is zero, we get

$$\text{Contribution} - \text{Fixed Costs} + \text{Non Operating Surplus} = 0$$

Or

$$\text{Contribution} = \text{Fixed Costs} - \text{Non Operating Surplus}$$

In case of Shatabdi Industries, this means that in the break-even situation, the contribution must be $30184 - 277 = 29907$.

The question now is at what level of sales, will Shatabdi contribution be equal to 29907. From the above table, we see that the variable costs are 39% of sales and that the contribution is 61 % of sales. If 61% of sales is 29907, the sales must be $29907 \times 100/61 = 49028$. This is the break-even level of sales.

At break-even, the operations of Shatabdi will look as follows:

Break-even sales	49028
<i>Less</i> Variable expenses	19121
Break-even contribution	29907
<i>Less</i> Fixed costs	30184
<i>Add</i> Non Operating surplus	277
Profit before tax	0

We can also state the break-even computation using a simple formula:

$$\text{Break-even sales} = \frac{(\text{Fixed Costs} - \text{Non Operating Surplus})}{\text{Contribution Margin Percentage}} \times 100$$

What does all this break-even analysis mean to the investor?

We found that Shatabdi break-even sales are 49028, which is about 80% of the current sales. This is a measure of the margin of safety for the company; its sales can drop by 20% before it shows a loss.

The contribution margin is perhaps the more important parameter as it measures the impact on profits of any change in sales. Shatabdi contribution margin of 61% means that every rupee of additional sales will increase the pretax profits by 61 paisa. Equally every rupee decline in sales will reduce pretax profits by 61 paisa. The traditional financial ratio analysis does not provide this information at all. For example, if we were to compute the ratio of PBT to Sales for Shatabdi, we would get $7612/61527 = 12\%$. An investor will be grossly mistaken if he were to conclude from this ratio that profits will rise only by 12 paisa for every rupee increase in sales.

The previous sections focused on the growth in demand for the industry and the firm. Since an investor is ultimately interested only in the profits of the firm, the forecasted demand growth has to be translated into earnings growth. The contribution analysis is the most important tool available to the investor for this purpose. Two notes of caution are, however, in order. First, this analysis is valid only as long as the existing capacity is adequate to meet the forecasted demand growth. This is because if new capacity has to be created, the cost structure (particularly the fixed costs) would change. Second, the traditional accounting statements do not provide adequate information about variable and fixed costs. The contribution margin, therefore, has to be assessed using the analyst's judgment about the cost structure.

Financial Analysis and Measures of Risk

Contribution analysis also leads to a measure of risk. Since an investor is ultimately concerned with the profit, his perception of risk would be determined by the possible variability in the profit. The variability in profits arises primarily because of variability in sales. We then ask what will be the percentage change in profits if sales changes by 1%.

Let us see what happens to the PBT of Shatabdi Industries if its sales drop by 1% from its current level:

	Current Level	99% of Current sales	Change (1% drop)
Sales	61527	60912	615
<i>Less</i> Variable expenses	24008	23768	240
Contribution	37519	37144	375
<i>Less</i> Operating fixed costs	27756	27756	0
<i>Less</i> Interest	2428	2428	0
<i>Add</i> Non operating surplus	277	277	0
Profit before tax	7612	7237	375

The decrease in PBT from 7612 to 7237 represents a drop for 4.93% though the drop in sales was only 1%. This amplification factor of 4.93 is known as the Degree of Total Leverage (DTL) and measures the risk arising out of the sensitivity of profits to compute

the value of DTL. It is simply the ratio between the Contribution and the PBT as shown below:

$$\text{DOL} = \frac{\text{Contribution}}{\text{PBT}} = \frac{37519}{7612} = 4.93$$

It is customary to break up this risk into two components: (i) the Degree of Operating Leverage (DOL) arising from the structure of operating costs of the firm, (ii) the Degree of Financial Leverage (DFL) arising from the capital structure of the firm.

The degree of operating leverage (DOL) measure the percentage change in EBIT for a 1% change in sales and is computed as follows:

$$\text{DOL} = \frac{\text{Contribution}}{\text{EBIT}} = \frac{37519}{7612 + 2428} = 3.74$$

The degree of financial leverage (DFL) on the other hand measures the percentage change in PBT for a 1% change in EBIT and is computed as follows:

$$\text{DOL} = \frac{\text{EBIT}}{\text{PBT}} = \frac{7612 + 2428}{7612} = 1.32$$

The degree of total leverage (DTL) is nothing but the product of DOL and DFL.

$$\text{DTL} = \text{DOL} \times \text{DFL} = 3.74 \times 1.32 = 4.93$$

Let us try to understand as to why changes in sales have an amplified impact on the profits. It is the presence of fixed costs of operations that cause a 1% change in sales to result in more than 1% change in EBIT. Similarly, since interest is also a fixed cost a 1% change in EBIT causes profits to change by more than 1%. The net effect is that the fixed costs acting as levers magnify the impact of changes in sales on profits.

Accounting Policies and Notes.

All accounting statements are prepared using a set of accounting policies regarding depreciation of fixed assets, valuation of inventory, recognition of income and other similar matters. On many of these matters, companies do have the freedom to choose between alternative accounting policies. For an investor, therefore, it is important to understand these policies to interpret the accounting statements correctly. Companies in India do not always disclose the complete details of all relevant accounting policies, but the more important of these can be gleaned from the section entitled 'Notes Forming Part of the Accounts' in the published annual report. These notes are often written in a style which makes it difficult even for accountants to understand their true import, but any

investor who takes fundamental analysis seriously will find that the time that he spends with these notes is amply rewarded.

We will illustrate the impact of accounting policies with two examples drawn from the published annual reports of Shatabdi Industries.

1. On reading these annual reports, we found that the Capital Reserves of Rs.4248 lakhs in Table 1 includes a revaluation reserve of Rs.4221 lakhs. Shatabdi had like many other companies revalued its fixed assets to bring them into closer correspondence with market values. An amount equal to the resulting increase in the value of the fixed assets was credited to a capital reserve as this notional gain belongs to the shareholders but is not available for declaration of dividends.
2. A perusal of the notes revealed that the company had been consistently charging depreciation on the Straight Line Method (SLM). In this method, the cost of any asset is charged off as depreciation in equal annual installments over the life of the asset. The alternative Written Down Value (WDV) method charges off higher amounts in earlier years and lower amounts in later years: the depreciation in each year is proportional to the depreciated value of the asset. For companies which are growing rapidly, the SLM depreciation can be below the WDV depreciation year after year. Since, the WDV basis is followed for Income Tax purposes; it is clear that the reported profits would then be higher than the taxable profits. Income tax as a percentage of reported profits would, therefore, be quite low. It will be seen from Table 2 that the provision for tax is less than 30% of reported PBT.

In order to see the impact of these two policies, we have eliminated the impact of revaluation and reworked the depreciation on WDV method. The recast summarized Balance Sheet of Shatabdi Industries as on 31.03.1991 is shown in Table 4.

**TABLE 4 Summarized Balance Sheet of Shatabdi Industries Ltd.,
Impact of Accounting Policy Changes.**

As on 31.03.1991		
Rs. in lakhs		
	As Reported	As Recast
Current Assets	28437	28437
Fixed Assets (Net)	29135	21177
Other Assets	27	27
Total Assets	57598	49640
Current Liabilities	13808	13808

Deferred Liabilities	19999	19999
Net Worth	23792	15834
Total Liabilities	57598	49640

The impact of both of the changes is to reduce the fixed assets and to reduce the net worth and the combined effect is indeed stunning. The net worth falls steeply to two thirds of the reported value. The book value per share drops from Rs.127.70 as per reported figures to Rs.85.00. Similarly, the Profit and Loss Account also undergoes a change: the increased depreciation charge for the year reduces the profit before tax by nearly 25% from the reported figure of 7612 to 5773.

We should not get bogged down with the question as to which method – SLM or WDV – is the ‘correct’ one. The important point is that before comparing two companies, we must recast their accounts on the basis of uniform accounting policies: either both on SLM or both on WDV. Otherwise, the comparison is meaningless. This point applies with equal force to ratio analysis where we are comparing the ratios with some industry norms. The reader would do well to recompute the ratios of Shatabdi Industries using the recast figures and see whether it changes his earlier assessment of the company.

Contingent liabilities disclosed in the notes is the another important thing that we should look out for. Amounts which are in dispute, which are indeterminate or which for other reasons the company believes it will not be required to pay are often shown as contingent liabilities in the notes instead of being provided for in the Balance Sheet as a liability or a provision. If the amount is large, the investor must be careful; if for some reason, the liability does materialize, it would erode the net worth of the company.

Business Analysis

The annual reports also contain a good deal of other information about the lines of business of the company, the capacity utilization, trends in volume and value of business, and some assessments about the future.

In case of Shatabdi Industries, we find that there are three major lines of business. The percentage of sales contributed by these three lines is as follows:

Export Business	25%	
Industrial Synthetics		35%
Cement	40%	

While we know the sales revenues for each business separately, we are unable to extract from the annual report the costs and profits of each of them.

Some costs are of course really joint costs and not attributable to any division, but even the costs that are relatable to each line like material costs are not separately disclosed in the annual report. In some cases, we can, of course, make informed guesses; for example, limestone and pozzalana could have been used only for the cement business.

There is some information about unit volumes and capacity utilization that we can extract from the report. Comparing 1991 and 1990 in terms of volume and value of sales, we found the following for the three lines of business:

Line of Business	Growth in Volume	Sales Value	Change in Unit Price.
Export Business	6%	32%	25%
Industrial Synthetics	-1%	2%	3%
Cement	2%	25%	23%

We can see that:

1. The export business shows a good rise both in unit volume and in value. The rise in unit prices is well in excess of the rate of depreciation in the value of the rupee, so that higher prices have been realized even in dollar terms.
2. Cement output has risen only marginally, and the growth in value is almost entirely accounted for by price increases. The price increase is clearly much above the general rate of inflation during the period.
3. Industrial synthetic output has declined marginally, and price has risen slightly to produce a marginal rise in sale value. The unit price has failed to keep pace with the general rate of inflation and it is very likely that the margins in this business are under pressure.

Further details on some of these can be found from the Directors' report and the Chairman's speech at the Annual General Meeting of the company. These statements contain the management's evaluation of the past year's results and its assessment of the prospects for the next year. Since these statements are the only place where the company's future is discussed, they are of great value to the investor. However, in deciding what reliance to place on these statements and how to interpret them, we must have regard for the past track record of the management. Some Chairmen tend to be unduly

optimistic about the future so that their statement about excellent prospects for the next year must be taken with more than a pinch of salt.

Half – Yearly Results

All companies listed on the stock exchange are required to publish unaudited half yearly reports within two months of the end of the half year (for companies closing the accounts in March, this means that the half-yearly results up to September must be published in October or November). These reports contain only a summarized P & L Account providing information on sales, other income, raw material costs, wages, interest, depreciation, provision for taxation and profits. Since the results are unaudited estimates, the investors cannot place much reliance upon them.

Material for presentation by Group B:

Modern Portfolio Theory

(Source: Book on Portfolio Management by professors S.K.Barua, V.Raghunathan and J.R.Varma)

Modern Portfolio Theory (MPT) is based on a few simple but fundamental insights into investor behavior. The contribution of the theory has been to put these insights into a coherent framework for analysis and decision making. Though the theory itself may at first sight seem complex, the insights on which it is based are quite easy to understand. Let us, therefore, begin by discussing these fundamental notions:

1. The Notion of Risk Suppose we evaluate two shares M and N for investment. We have collected data on the returns earned by investors on these shares in the last five years which are as follows:

Share M : 30%, 28%, 34%, 32% and 31%

Share N : 26%, 13%, 48%, 11% and 57%

If we have to choose only one of the two shares for investment, which share shall we choose? One approach would be to compute the average return for each share and choose the one which has higher average return. If we do that, we find that both the shares have an average return of 31%. Can there be any other criterion for choice? Most investors would regard share N to be riskier as its return fluctuates substantially from year to year. They would, therefore, prefer share M to N. Thus, investors appear to make their choices based on two considerations: expected returns. Riskiness is measured by the variability in returns.

2. The Notion of Diversification Investors seem to follow the well-known adage, “Do not keep all your eggs in one basket”. They invariably invest in more than one security so that losses in one may be offset by gains in another. In this manner, investors are able to reduce the variability of returns.

3. The Notion of a Portfolio The set of all securities held by an investor is called his portfolio. The portfolio may contain just one security, but we have already seen that, in general, it will contain several securities. One of the important contributions of MPT has been to show that we should analyze the portfolio in its entirety and not merely a security in isolation.

4. The Notion of dominance The MPT is based on two very basic and intuitively acceptable statements about risk and return:

- a. If two portfolios have identical expected returns, then investors would choose that portfolio which has a lower risk.
- b. If two portfolios have identical risks, then investors would choose that portfolio which has a higher expected return.

5. The Notion of Non-diversifiable or Market Risk while diversification does reduce risk, even a very highly diversified portfolio does not become risk free. The well-diversified portfolio that we can think of is the one which contains all the securities in the stock market (technically known as the market portfolio). Even this portfolio reveals substantial variability as is evident from the fluctuations in the market index. This risk is clearly undiversifiable and is known as market risk.

6. The Notion of Beta The above discussion indicates that the most important source of risk is the market risk because it cannot be eliminated through diversification. The modern Portfolio Theory, therefore, argues that the riskiness of a security should be measured by its vulnerability to market risk. If the market were to go down by 1%, would the security go down by 0.5%, by 1% or by 2%? This sensitivity of the security to the movements of the market is known as the beta coefficient of the security.

7. The Notion of Trade off between Risk and Return The modern portfolio theory also demonstrates that if the securities are correctly priced, the return on each security would be commensurate with its risk as measured by its beta. The graphical depiction of the resulting straight line relationship between return and beta is known as the security market line. A similar straight line relationship, called the capital market line, exists between return and risk (as measured by variability) of well-diversified portfolio.

The rest of this chapter is devoted to an exposition of MPT. We shall in the process make the above notions more precise and rigorous.

What is Risk?

Let us go back to the example at the beginning of this chapter where we looked at the returns over the last five years on shares M and N:

Share M: 30%, 28%, 34%, 32% and 31%

Share N: 26%, 13%, 48%, 11% and 57%

We concluded intuitively that share N was riskier because its return fluctuated much more. While both had an average return of 31%, N's returns deviated to a greater extent from this average than M's did. Statisticians measure this kind of deviation or fluctuation by either the standard deviation or the variance. In MPT, the variability or riskiness of securities is measured by the standard deviation of the security returns. Standard deviation is usually denoted by the Greek letter σ (pronounced sigma). The variance is nothing but the square of the standard deviation and hence denoted by σ^2 (pronounced sigma square). The mathematical definitions of standard deviation and variance have been explained in Appendix 5, but the average reader need not know these definitions at all. All that is important

is to know that s is a measure of risk which captures the intuitive notion of variability.

The riskiness of share M as measured by s is 2% while that of N is 18.5%. This confirms our intuitive notion that N is riskier, but now we have a more precise expression of how much riskier N really is. It is about nine times riskier than M.

Gains from Diversification

We have already seen that the principle of diversification requires us to invest in more than one security so that losses in one may be offset by gains in another. In this manner, we hope to reduce the variability of returns.

Does diversification really reduce risk? If so, by how much? Can risk be completely eliminated? In order to answer these questions, let us first consider a simple though somewhat exotic example.

Example 1.

Consider an alien planet Delta, which in a given year is either under a spell of hot wave, or a cold wave, either of which is equally likely to prevail. Let us assume that the only two companies constituting the entire market in the planet are an ice-cream firm and a hot coffee firm. Assume further that if hot wave dominates the planet in a given year, the ice-cream company would register a high return of 30%, while the coffee company would suffer, earning only 10%. If, on the other hand, the cold wave dominates the planet in a given year, the coffee company would register a return of 30%, while the ice-cream company would earn only 10%. Thus, on an average both companies are expected to produce a yield of 20%, and they would have the same variance (s^2)

What should be the best investment strategy for an investor in the above planet?

Solution

In this example, if we invested in only one of the two companies, our expected return will be 20%, with a possible deviation (risk) of 10% either way. If, however, we split our investment between the two companies equally, so that our investment replicates the total market in miniature, half of our investment would certainly earn 30%, while the other half would earn 10%, so that our average return would always be 20%, no matter what the vagaries of weather during the year. Clearly, the diversification results in 20% return without risk, whereas holding individual securities was yielding an expected return of 20% with risk.

In the above example, diversification eliminated all risk because the returns of the two companies moved diametrically opposite to each other: when one return was 30%, the other was 10% and vice versa. This was because there was only one

source of risk in planet Delta – the weather – and it affected the two securities in exactly opposite directions. Such a situation seldom occurs in real life. More often than not, in practice, there are several sources of risk some of which affect only one of the securities, some affect both in opposite directions and some others affect them in the same direction. Clearly it is important to know what is the net effect of all these multiple causes which affect the security returns. Do the securities move in the same direction or in opposite directions? In either case, what is the strength of the coefficient (denoted by the symbol ρ) to answer these questions? The correlation coefficient ranges from -1 to +1. If the two returns move exactly opposite to each other, the correlation coefficient is -1, if they move exactly in step with each other, then it is +1; if the two returns are entirely unrelated to each other, it is zero. A positive correlation coefficient which is less than +1 indicates that the two returns have a tendency to move in the same direction, but are not always in exact step with each other. This kind of imperfect correlation is most commonly observed, since two different securities belonging to two different firms can hardly be expected to move in perfect harmony with each other. Positive correlation between two securities implies, for example, that when the market as a whole booms, both the securities would register a rise in prices, or when the market crashes, both the securities would show a decline in prices.

Let us, next, move from Planet Delta to Planet Earth and consider a more realistic example.

Consider two securities X and Y with the following attributes:

Expected return on Security X	=	20%
Expected return on Security Y	=	30%
s of Security X	=	10%
s of Security Y	=	16%

Coefficient of Correlation

Between the Returns of X and Y = -1, 0.5, +1 (three scenarios).

We shall evaluate the impact on the gains from diversification, for the three different values of the correlation coefficients.

Let us first analyze the case where we hold a portfolio with 40% invested in X and 60% invested in Y. The expected portfolio return is nothing but the weighted average of the expected returns from each security in the portfolio, the weights being the proportion of investment in each security. Therefore, the expected portfolio return will be 26% (being $20 \times 0.4 + 30 \times 0.6$).

Is the s of portfolio return the same as the weighted average of the s 's of the security returns? That is, would the s of portfolio return be 13.6% (being $10 \times 0.4 + 16 \times 0.6$)? These questions cannot be answered because the variability of

portfolio return not only depends on the variability of the security returns, but also on the correlation coefficient.

The σ of portfolio return will be 13.6% only when the two securities X and Y move in perfect tandem with each other, that is, when the correlation coefficient between returns on X and returns on Y is +1. So long as X and Y have a correlation coefficient of less than +1, the σ of the portfolio return will be less than 13.6%. For example, if the correlation coefficient is only 0.5, then the σ of the portfolio will be only 12.1%.

The fact that the portfolio σ is only 12.1% as against the weighted average σ of 13.6% implies there has been some gain from diversification. Let us see why this is so. If we invest all our money in Y, the expected return is 30% and the risk is 16%; while if we invest all our money in X, the expected return is 20% and risk is 10%. We have assumed 6% additional risk for 10% additional return. This implies that if there were no gains from diversification, as we move our money from X to Y, on an average, for every 1% additional returns, we have to take 0.6% additional risk. For example, if the correlation coefficient is +1, since the σ of portfolio return is nothing but the weighted average of the σ 's of security returns, there is no gain from diversification, because every 1% increase in return is accompanied with the average 0.6% increase in risk. It can be shown that except in this extreme case of a correlation coefficient of +1, investing in two securities does result in gains because the increase in risk for every 1% increase in return is below the average increase in risk. In our illustration above, the return rose from 20% to 26% and the risk from 10% to 12.1% implying that there was only a 0.35% increase in risk for every 1% increase in return. Gains from diversification allow us to get additional return with less than commensurate increase in the risk level.

Let us extend our understanding of how an investor stands to gain through diversification by investing in securities with imperfectly correlated returns, by examining Table 1, which contains the expected return and risk for varying composition of portfolio. The portfolios are also graphically displayed Fig 1, in which the risk (σ) is on the horizontal axis and the expected return is on the vertical axis. The three curves in the figure are for three different degrees of correlation between the securities.

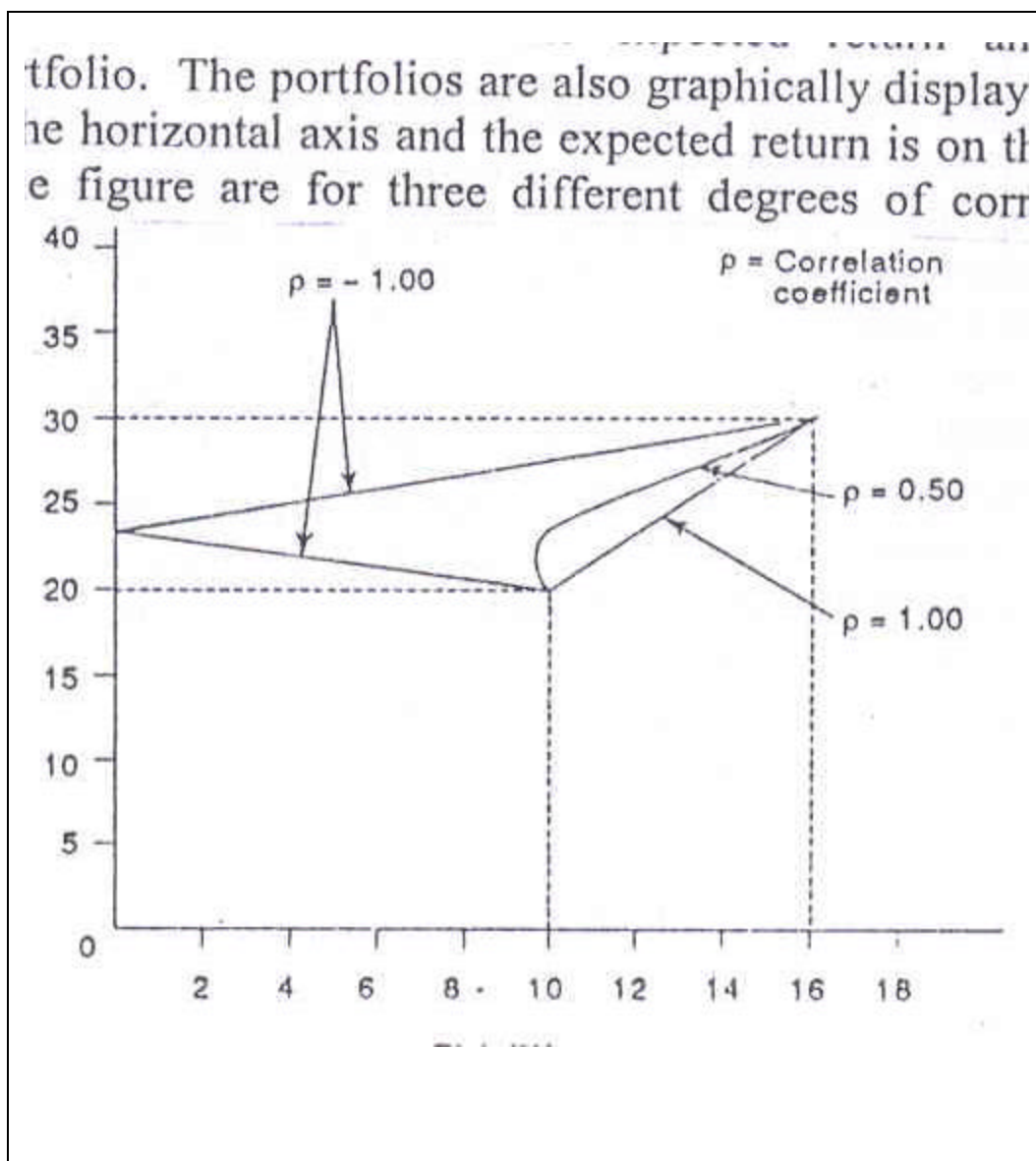


Fig. 1 Gains from Diversification.

TABLE 1 Portfolio Returns

Proportion Invested		Expected Return	Volatility (s) when Correlation Coefficient (?)		
In X	In Y		=1.0	=0.5	=-1.0
1.00	0.00	20.00	10.00	10.00	10.00
0.95	0.05	20.50	10.30	9.92	8.70
0.90	0.10	21.00	10.60	9.90	7.40
0.85	0.15	21.50	10.90	9.92	6.10
0.80	0.20	22.00	11.20	9.99	4.80
0.75	0.25	22.50	11.50	10.11	3.50

0.70	0.30	23.00	11.80	10.28	2.20
0.65	0.35	23.50	12.10	10.49	0.90
0.615	0.385	23.85	12.31	10.66	0.00
0.60	0.40	24.00	12.40	10.74	0.40
0.55	0.45	24.50	12.70	11.03	1.70
0.50	0.50	25.00	13.00	11.36	3.00
0.45	0.55	25.50	13.30	11.72	4.30
0.40	0.60	26.00	13.60	12.11	5.60
0.35	0.65	26.50	13.90	12.52	6.90
0.30	0.70	27.00	14.20	12.96	8.20
0.25	0.75	27.50	14.50	13.43	9.50
0.20	0.80	28.00	14.80	13.91	10.80
0.15	0.85	28.50	15.10	14.41	12.10
0.10	0.90	29.00	15.40	14.93	13.40
0.05	0.95	29.50	15.70	15.46	14.70
0.00	1.00	30.00	16.00	16.00	16.00

The tabulated values and the graphs demonstrate the impact of correlation in returns on the variability of portfolio return.

If the return on the two securities are perfectly correlated (that is, correlation coefficient = 1.0), the portfolio return moves along the straight line joining points X and Y. as we move from X to Y, for every 1% increase in the expected return, the risk of the portfolio goes up by 0.6%. In effect, there is no reduction in risk on account of diversification, when the returns across the securities are perfectly correlated, since the volatility (as measured by σ) of the portfolio return is the weighted average of the volatility of the individual securities.

If the returns are imperfectly correlated (say, correlation coefficient = 0.5), the portfolio return moves along a curve, reaching level of risk (σ) which is below the weighted average risk. For a given value of expected portfolio return, the risk with imperfect correlation is always below the risk when there is perfect correlation.

If the returns are perfectly negatively correlated (that is, correlation coefficient = -1.0), the risk can be reduced to zero. By investing about 61.5% of money in X and the rest in security Y, an investor can derive risk-free return ($\sigma = 0.0$) of 23.85%. For most other portfolios, for a specified value of expected return, the risk in this case would be much lower than the risk when there is perfect correlation in returns.

It is clear from the above, that whenever the two security returns are less than perfectly correlated, an investor gains through diversification, the gains can often reduce the risk of the portfolio below the risk of securities comprising the portfolio.

In general, an investor is likely to have many securities in his portfolio. The computation of the expected return of the portfolio as usual is merely the weighted average of the

expected returns of the individual securities comprising the portfolio, the weights being the respective proportion of each security in the portfolio.

The variance (s^2) of the portfolio return can be computed by repeated application of the procedure used in the two security situation above. The portfolio of two securities can be regarded as a single new security and combined with the third security, and the process repeated till all n securities have been included in the portfolio.

At this stage we may ask whether the gains from diversification will continue to be realized, till the portfolio return variance (s^2) reduces to zero. A little reflection will show that this is not so. For if it was so, and then the portfolio consisting of all securities in the market (technically called the market portfolio) which is the most diversified portfolio imaginable would not have any risk. Yet we know that the market index does fluctuate quite substantially though less than an individual security does. This suggests that there is a minimum level of risk below which we cannot get by merely diversifying our portfolio.

In general, as the number of securities in a portfolio increases, say up to 20 or 25, the diversification reduces the portfolio risk (s^2) rapidly. However, soon thereafter, the marginal reduction to portfolio risk of any further diversification becomes very small (Fig 2). Thus, a diversified portfolio of about 25 securities

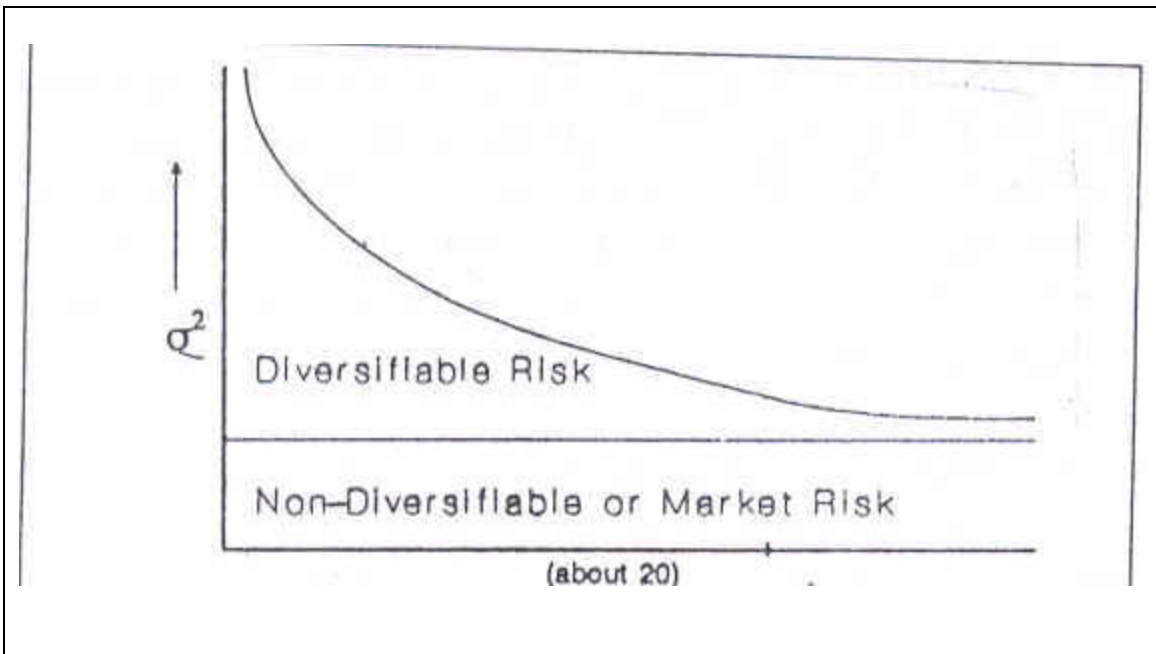


Fig 2 Reduction of Risk through Diversification.

Selected from different industries more or less represents a market portfolio. Consider for example, the BSE Sensex index which comprises a mere 30 securities, but is deemed to represent the entire market. Again, it is for the reason that both the Sensex Index with its 30 securities and the BSE National Index comprising 100 securities are actually very

highly correlated. Clearly, increasing the number of securities from 30 to 100 does not necessarily improve the diversification substantially.

Diversifiable and Non-Diversifiable Risk

We saw earlier that diversification reduces risk but does not eliminate it. We saw that even the most well diversified portfolio that we can think of is subject to the risk arising from fluctuations in the market index itself. This risk is known as market risk. Since all securities move with the market to some extent, this is a risk which no amount of diversification can eliminate. We now turn to a more detailed analysis of market risk and its implications for portfolio theory.

The riskiness of each security can now be divided into two components: the market related risk which cannot be diversified away at all, which is called non-diversifiable or systematic risk and another component which can be eliminated through diversification, called diversifiable or unsystematic risk. Let us see how these two components of risk arise.

Unsystematic risk may be regarded as the extent of variability in the security's return on account of firm specific risk factors. This is also called avoidable risk because it is possible to eliminate or diversify away this component of risk to a considerable extent by investing in a portfolio of large number of securities, say 15 or more. This because, the firm specific risk factors are mostly random. For example, if the management of one company in the portfolio is poor, the management of another company in the portfolio may be very good; at a given point of time if the productivity in one company is low, that of another may be high and so on, so that by including sufficient number of securities in a portfolio, such factors tend to cancel out the effect of each other. Similarly, the risk arising out of industry specific factors can be eliminated by diversifying across several industries.

However, the systematic factors cannot be diversified away completely. This is because these factors affect the entire market in a certain direction. For example, a steep increase in the international crude oil prices is almost certain to affect the entire market adversely. Hence no amount of diversification can make a portfolio totally free from such risk, even though diversification may reduce this risk up to a point. Therefore, this level of systematic risk below which the riskiness of a portfolio cannot be reduced is also called unavoidable risk.

Capital Asset Pricing Model.

We have described how investors trade off risk for reward. What is the exact nature of this trade off? How much reward is sought by the investors for a unit of risk? Which risk is relevant in the context of this trade off? The entire risk? The non-diversifiable risk? Diversifiable risk? How does one measure non-diversifiable and diversifiable risk? What is the role of diversification in the context of portfolio selection? These and other

related questions need to be answered by a good portfolio manager. In this section we proceed to provide answers to such questions.

Dominant Portfolios

The notion of dominance is based on two very easily understood statements: (i) if two portfolios have identical expected return, then investors would choose the one with lower volatility of return (measured through σ), (ii) if two portfolios have identical volatility of return, then investors would choose the one with higher expected return. Let us once again consider our earlier illustration of securities X and Y on planet Earth, in which the expected returns on securities X and Y are 20% and 30% respectively and their σ 's are, 10% and 16% respectively, with the coefficient of correlation between the returns of X and Y being 0.5.

Neither share dominates the other since X has lower return and Y has lower risk. If forced to choose between X and Y, some investors may choose X and some Y, depending on the extent of risk they are willing to assume. But the situation changes when we look at the portfolio combining X and Y in a ratio of 9:1. In Table 7.1, we see that when we invest 90% in share X and 10% in Share Y, the expected return is 21% and the σ is 9.90%. This portfolio dominates share X which has a lower return of 20% and portfolio dominates share Y which has a lower return of 30% and a higher risk of 16%. The dominance principle allows us to say that no investor would invest 100% in share X.

This example involved only two securities. Conceptually, the notion of dominance can be extended to all portfolios that are possible, by combining all the risky securities available in the market, in various proportions. The result can be shown graphically as in Fig 3, where return is on the vertical axis and risk on the horizontal axis. The enclosed area in the figure is the opportunity set, i.e., the set of all possible portfolios. The upper (concave) part of the boundary of the opportunity set of portfolios is known as the efficient set or efficient frontier. It is visually clear

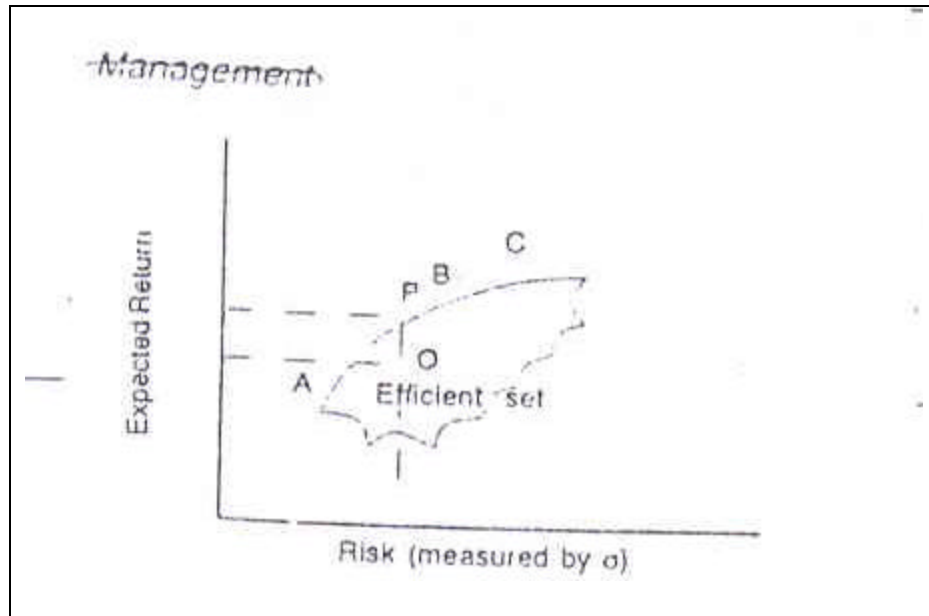


Fig 3 the Efficient Frontier

That any portfolio below the efficient frontier has a lower return than the portfolio on the efficient frontier vertically above it. The efficient frontier thus dominates all other portfolios. Applying the dominance rules, only the portfolios on this frontier would be chosen by investors, as for a given level of expected return or volatility, they represent the best choice an investor can make. For example, no investor will invest in portfolio Q, given that for the same level of risk he can obtain a higher return if he invests in portfolio P (Fig.3).

If we consider the portfolios on the efficient frontier itself, no portfolio is dominated by any other. How would an investor choose between them? The answer is that the choice must be based on the investor's willingness to assume risk. In Fig. 3, we have shown the portfolio choices of three investors A, B and C. A is a very conservative investor who wishes to keep his risk low; he chooses a point close to the left end of the efficient frontier. Investor C is more interested in increasing his return than in containing his risk. His choice is close to the right end of the efficient frontier. B is not given to such extremes as A and C; he is a believer in the 'golden mean', and chooses a point close to the middle of the efficient frontier.

It can be shown that the opportunity set must always assume the shape of a broken egg placed smooth side towards the 'north-west', as in Fig 3. For example, if the graph were to plot with the smooth side pointing towards north-east, as shown in Fig 4, then portfolio P will completely dominate portfolio Q, since the former has a lower risk and a higher expected return, so that nobody will ever want to invest in Q, driving this security out of the market. Therefore, such a shape of efficient frontier is not possible.

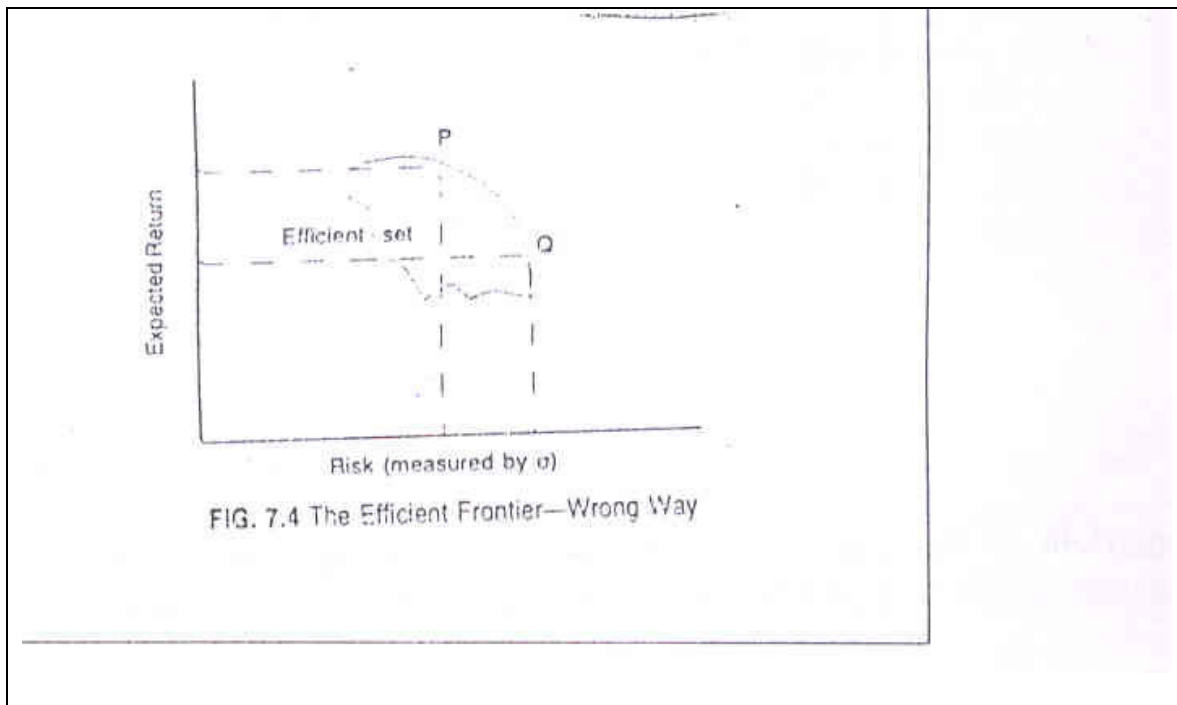


Fig. 4 The efficient Frontier
Portfolio Choice with a Risk-free Security.

In the above discussion of the efficient frontier, we assumed that the opportunity set comprised only risky securities, so that all portfolios had some risk as measured by non-zero volatility. Let us examine how the portfolio choice would be altered when we introduce a security with zero volatility. In other words, we bring in a more realistic scenario, wherein investors have opportunities to invest or borrow at risk-free rate of return. This security being risk-free, yields a fixed return, and hence has a correlation coefficient of zero with all other securities available for investment. The government bonds may be regarded as one such security, the expected return on which is the yield available on the bonds. Let us examine the impact of introducing this security on the nature of the efficient set.

The risk-free security F which yields a return of r_f has been depicted in Fig. 5. The return on a portfolio with part investment in the risk-free security and the balance in a set of risky securities represented by point V would be the weighted average of the two returns, depicted by point P on the line joining F and V . The s represented by point P will merely be the proportion of investment in V times the s of V .

For example, if the risk-free rate of return r_f is assumed to be 12% (with a s of zero, since the return on a risk-free security has no volatility by definition) and portfolio V denotes an expected return and s of 30% and 20% respectively, and an investor has 40% of his investment in F and 60% in V , then the combined

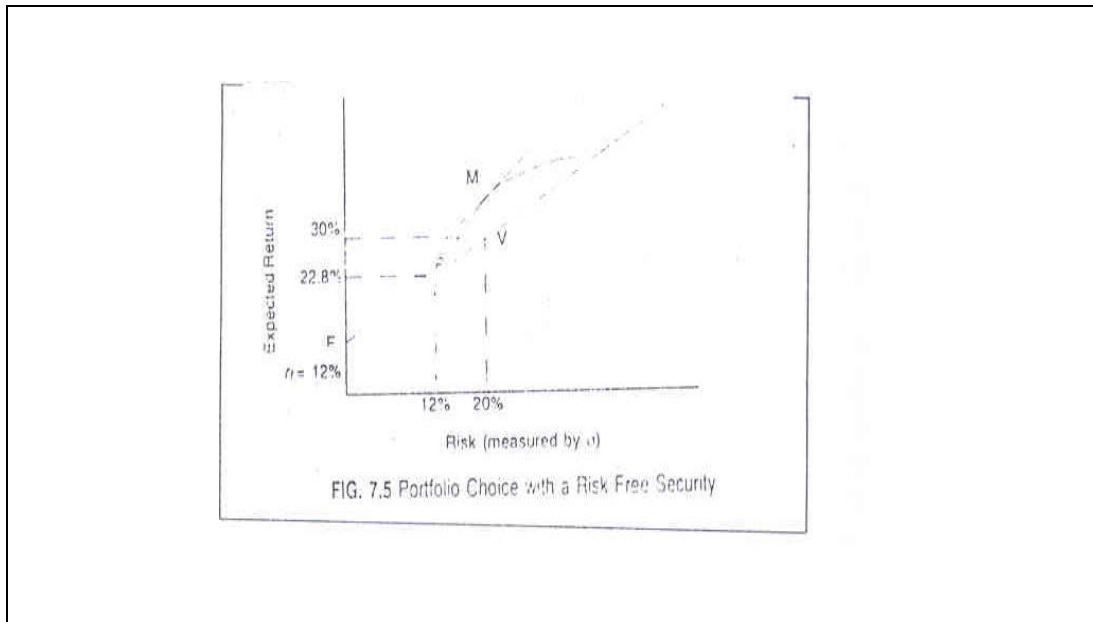


Fig 5 Portfolio Choice with a Risk Free Security

Portfolio of the risk-free and the risky investments, represented by point P, will yield an expected return of 22.8% (being $0.4 \times 12 + 0.6 \times 30$) and have a σ of 12% (being 0.6×20).

The portfolios representing all possible combinations of F and V would lie on the straight line joining F and V (Fig 5). What is the impact of introducing the risk-free security on the efficient set? Which risky portfolio from the efficient set of risky portfolios would investors choose to combine with the risk-free security? The line representing a portfolio of F and a risky security from the efficient set of risky portfolio would be pushed as far up as possible. Till it is tangential to the erstwhile efficient set at point M. In their attempt to maximize the expected return for a given level of risk, all investors would choose a portfolio lying on this line. Therefore this would become the new efficient set.

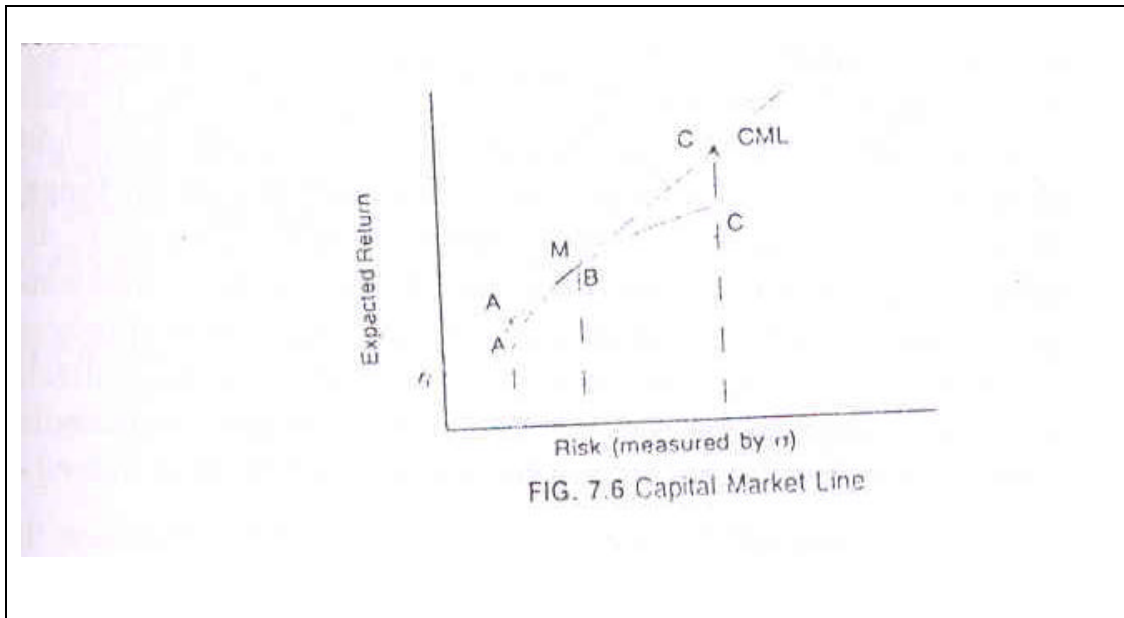


Fig. 6 Capital Market Line.

Let us now examine the impact of introducing the risk-free security on the choice of portfolio by our friends A, B and C. As can be seen from Fig. 6, both A and C have been able to increase the expected return on their portfolio, by moving to A' and C' without adding to the risk they had assumed earlier. There is no change in the portfolio of B as he had inadvertently chosen the point of tangency, M as his portfolio even earlier.

Let us now understand the changes that these individuals have made in their portfolios. To begin with, all of them had invested in a portfolio on the efficient set of risky portfolio. When risk-free security became available for investment, it was profitable for A to have a part of his investment in risk-free security and the balance in risky portfolio M, while it is profitable for C to borrow at the risk-free rate and invest his own capital plus the borrowed amount in M. as a result of this, A would have what is called a lending portfolio and C would have a borrowing portfolio. Since individual B had invested in portfolio M from the beginning, the change in the efficient frontier does not change his portfolio.

Market Portfolio

Let us now examine the nature of portfolio M in reality. We may argue that if there is a portfolio represented by point M, it can be identified by many financial analysts in the market. This is because the exercise thus far was quite straightforward, namely constructing an efficient set of securities by identifying a large number of risky securities in the market and by composing several portfolios by mixing them in various proportions, and so on; altogether an exercise not really beyond the scope of a large computer. If under such a scenario, the analysts recommended that a particular security, I, be left out of the portfolio M, everybody who held security I would want to sell it off, so that the ensuing selling pressure would bring down the price of I so that the return from it would

become attractive once again and the analysts would have to recommend its inclusion in the portfolio M. hence we may say that portfolio M will be a portfolio from which none of the risky securities from the market may be left out.

Again, if a particular security J were considered particularly attractive so that the analysts recommended a large proportion of investors' capital to be invested in J, everybody who does not already have that proportion of J in his portfolio would rush to buy more of J till the price of J rose to a level where its return would no longer appear attractive and one would be forced to reduce the proportion of holding in J. Hence we may say that in equilibrium, portfolio M would not only comprise every risky security in the market, but the proportion of investment in each security will be proportional to the market capitalization of that security – no more, no less (market capitalization of a security is its market price multiplied by the number of that security outstanding in the market). It can be readily seen that the entire market taken as a whole is indeed one such portfolio!

Capital Market Line

Thus the portfolio M is nothing but the market portfolio that is a portfolio comprising all the risky securities that are traded in the market. As we have already seen, since the efficient frontier is a straight line passing through F and M, all investors would have their portfolios on this line. This line is called the capital market line (CML) (Fig. 5). The relationship between the return and risk of any portfolio, P, on this line is given by the following equation:

Risk premium of a portfolio =

$$\text{Risk premium of market} \times \frac{\text{Risk of Portfolio}}{\text{Risk of Market}}$$

Where

Risk premium of a portfolio is the excess of the expected portfolio return (E_p) over the risk-free rate of return,

Risk premium of market is the excess of the expected market return (E_m) over the risk-free rate of return, and

Risk of portfolio and market refer respectively to the s's of the portfolio and market returns.

The above equation implies that CML passes through the risk-free rate, r_f , which represents the pure time value of money, or, the reward for waiting.

Security Market Line

The Modern Portfolio Theory (MPT), as we have seen, argues that investors dislike risk, and, therefore, will buy a riskier security only if they are suitably rewarded in the form of higher expected return. This suggests that in a well-functioning market in which securities are correctly priced there should be a relationship between return and risk of

individual securities. The theory asserts not only that such a relationship exists, but also that it has a very simple form which we shall now state.

According to MPT, a part of the return on any security or portfolio is a reward for risk and the rest is the reward for waiting, representing the time value of money. Specifically, the risk-free return (which is earned by a security which has no risk) is the reward for waiting and the excess of the return over the risk-free return is the risk premium or the reward for risk. The Modern Portfolio Theory asserts that the risk premium of any security is directly proportionate to the risk as measured by the Beta:

$$\text{Risk Premium of a Security} = \text{Beta} \times \text{Risk premium of market}$$

Where

Risk premium of a security is the excess of the expected security return over the risk-free rate of return, and

Risk premium of market is the excess of the expected market return over the risk-free rate of return.

The above relationship can also be expressed as:

$$\text{Expected return on security} = \text{Risk-free return} + \text{Beta} \times \text{Risk Premium of market.}$$

The above relationship, which is basically a simple linear relationship between risk and return, is known as the Capital Asset Pricing Model (CAPM). The credit for developing the arguments leading to the model goes to Sharpe, Linter and Mossin. The first author of the model was also one of the three who shared the Nobel Prize for Economics in 1990 for the work. While CAPM is valid for all capital assets, in this chapter we have mostly used the term 'securities' since in this book securities are what we are primarily concerned with.

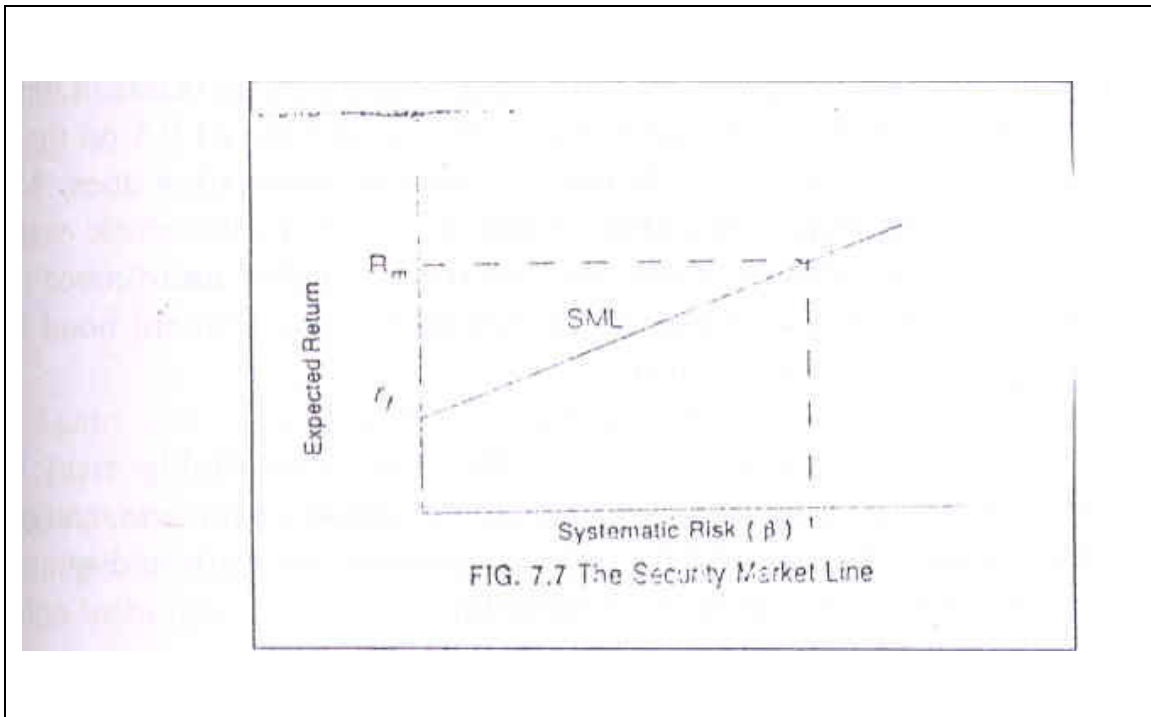


Fig 7 The Security Market Line.

It is obvious that higher the value of beta, higher would be the risk of the security and therefore larger would be the return expected by the investors. The beta coefficient of the market portfolio by definition is 1. The line joining points $(r_f, 0)$ and $(R_m, 1)$ in Fig 7 is the security market line (SML).

A major implication of CAPM is that not only every security but all portfolios too must plot on SML. This implies that in an efficient market, all securities are expected to yield returns commensurate with their riskiness, measured by β .

CML and SML

It is interesting to contrast CML with SML. Both postulate a linear (straight line) relationship between risk and return. In CML, the risk is defined by the total risk (σ), while, in SML, the risk is defined by the undiversifiable market related risk (β). Capital Market Line is valid only for fully diversified (efficient) portfolios while SML was valid for all portfolios and for individual securities as well.

Beta

We have discussed the distinction between diversifiable risk and non-diversifiable risk at such length because from the point of view of an investor whose portfolio is well diversified, the diversifiable risk is of no importance as it has been eliminated. What is important to such an investor is the non-diversifiable risk arising from market wide movements of security prices. This is one of the most important conclusions of the MPT: the real riskiness of a security is its non-diversifiable risk.

The Modern Portfolio Theory, therefore, defines the riskiness of a security as its vulnerability to market risk. This vulnerability is measured by the sensitivity of the return of the security vis-à-vis the market return and is denoted by the Greek letter beta (β). A beta of 2 implies that if the market returns increases or decreases by 10% over a period, the security return increases or decreases respectively by 20%. Thus in this case the security return moves twice as much as the market return. A beta of 0.5 on the other hand implies that the security return moves only half as much as the market does. Market portfolio which refers to the portfolio consisting of all securities in the stock exchange has a beta of 1, since such a portfolio behaves like the market index and moves in line with it. A beta of zero characterizes a risk-free security like a government bond whose return is almost insensitive to the market return.

Thus beta measures the only kind of risk (the non-diversifiable risk) which matters; the higher the riskiness of a security, the higher the value of its beta. A security with a beta value greater than 1 is referred to as an aggressive security and one with a beta value less than 1 is referred to as a defensive security.

The beta of a portfolio is nothing but the weighted average of the betas of the securities that constitute the portfolio, the weights being the proportions of investments in the respective securities. For example, if the beta of security X is 1.5 and that of security Y is 0.9 and 70% and 30% of our portfolio is invested in the two securities respectively, the beta of the portfolio will be 1.32 ($1.5 \times 0.7 + 0.9 \times 0.3$).

Estimating Beta Values

We have already seen that beta is the sensitivity of the security returns to changes in the market returns. The statistical method of estimating this kind of dependence of one variable on another is known as simple linear regression. If we have access to a computer or to a good statistical calculator, we do not need to know the details of this statistical technique at all. The machine does the hard work and gives us the results. In the case of personal computers, the method of linear regression is available in standard spreadsheet and other software packages.

Simple linear regression, measures the dependence of one variable known as the dependent or Y variable on another variable known as the independent or X variable. In our case, the Y variable is the security return and the X variable is the market return.

The security return on any day is defined as:

$$\text{Today's return} = \frac{\text{Today's price} - \text{Yesterday's price}}{\text{Yesterday's price}}$$

If the market was closed *yesterday*, we must use the price of the previous trading day instead of yesterday's price. Instead of the daily returns defined above, we can compute weekly returns using this week's and last week's price instead of today's and yesterday's price in the above formula. Similarly, we can compute monthly returns also.

The market return on any day is similarly defined as:

$$\text{Today's market return} = \frac{\text{Today's index} - \text{Yesterday's index}}{\text{Yesterday's index}}$$

Again, weekly and monthly index returns, etc. can be consistently defined.

Once we have computed the security and market returns for a sufficiently long period to get a large number (50 or more) of pairs of returns, we can use the linear regression technique to estimate the beta.

As investors we need not worry too much about the details of the linear regression technique by which the beta is estimated. But there are a few things about Beta estimation that we must be careful about:

1. *Daily, weekly or monthly returns* We (the authors) prefer daily returns because it gives us more number of returns and therefore improves the accuracy of the beta estimate. In some cases, however, we may use weekly or monthly returns because these may be easier to collect.
2. *Period of analysis* In general, using a longer period gives us more date to estimate the beta correctly. But if we believe that beta has changed in the recent past because of any changes in the riskiness of the company, we may wish to use a shorter period. We, the authors, have found that using daily returns for 18-24 months is usually a good compromise between these conflicting requirements.
3. *Exceptional price movements* Occasionally, we find that on some specific days, the share price has recorded an exceptional rise or fall of a kind which we do not expect to recur in future. We may sometimes find it advantageous to eliminate the returns of these days before estimating the beta.

Some of the factors discussed above do, at times, require some degree of judgment and statistical analysis. For this reason, in many developed countries, there are specialized agencies which perform all this analysis and publish their beta estimates for various stocks at regular intervals. In India, we do not yet have these agencies. In the meantime, we will have to do this analysis ourselves to estimate the betas that we need.

EXAMPLE 2

Let us consider the daily prices of the ITC share and the daily Bombay National Index for the period January 1989 – October 1990 (BSE data), based on the trading days. Columns

2 and 3 of Table 2 give the share price and the index respectively, for the period. The intermediate values have been omitted, since objective of this example is only to illustrate the computation of beta and the use of CAPM. We want to compute the beta (β) of ITC using this data.

TABLE 2: ITC Price & BSE Index Data

Date	ITC Price	BSE National Index	Returns	
			ITC	Index
1989 Jan 2	48.00	339.10		
1989 Jan 4	49.00	330.21	2.04%	-2.69%
1989 Jan 5	46.00	324.32	6.52%	-1.82%
1989 Jan 6	45.00	324.20	-2.22%	-0.04%
1989 Jan 9	46.00	337.06	2.17%	3.82%
1989 Jan 10	48.00	339.52	4.17%	0.72%
1989 Jan 11	48.00	337.78	0.00%	-0.52%
1989 Jan 12	49.00	336.86	2.04%	-0.27%
1989 Jan 13	48.00	332.62	-2.08%	-1.27%
1989 Jan 16	49.00	333.30	2.04%	0.20%
1989 Jan 17	47.00	333.12	-4.26%	-0.05%
1989 Jan 18	47.00	331.82	0.00%	-0.39%
1989 Jan 19	47.00	329.53	0.00%	-0.69%
1989 Jan 20	48.00	328.73	2.08%	-0.24%
1989 Jan 23	45.00	326.68	-6.67%	-0.63%
1989 Jan 25	46.00	341.15	2.17%	4.24%
1989 Jan 27	48.00	344.43	4.17%	0.95%
1989 Jan 30	48.00	346.71	0.00%	0.66%
1989 Jan 31	50.00	348.95	4.00%	0.64%
1990 Sept. 3	145.00	653.79	1.38%	2.53%
1990 Sept. 4	130.00	631.78	-11.54%	-3.48%
1990 Sept. 5	135.00	625.06	3.70%	-1.08%
1990 Sept. 6	135.00	635.69	0.00%	1.67%
1990 Sept. 7	135.00	648.14	0.00%	1.92%
1990 Sept. 10	127.50	659.32	-5.88%	1.70%
1990 Sept. 11	133.75	677.60	4.67%	2.70%
1990 Sept. 12	135.00	666.65	0.93%	-1.64%
1990 Sept. 14	132.50	644.82	-1.89%	-3.39%
1990 Sept. 18	138.00	668.34	3.99%	3.52%
1990 Sept. 19	143.00	676.30	3.50%	1.18%
1990 Sept. 20	155.00	681.27	7.74%	0.73%
1990 Sept. 21	165.00	695.83	6.06%	2.09%
1990 Sept. 25	171.25	729.69	3.65%	4.64%
1990 Sept. 26	162.50	704.81	-5.38%	-3.53%
1990 Sept. 27	165.00	706.94	1.52%	0.30%
1990 Oct. 4	156.25	708.68	-5.60%	0.25%
1990 Oct. 9	173.75	762.72	10.07%	7.09%
1990 Oct. 11	157.50	727.41	-10.32%	-4.85%
1990 Oct. 12	145.00	692.60	-8.62%	-5.03%

1990 Oct. 15	142.50	638.04	-1.75%	-8.55%
1990 Oct. 18	142.50	655.11	0.00%	2.61%
1990 Oct. 22	135.00	615.25	-5.56%	-6.48%
1990 Oct. 25	140.00	646.67	3.57%	4.86%
1990 Oct. 26	141.25	640.44	0.88%	-0.97%
1990 Oct. 31	142.50	640.96	0.88%	0.08%

Solution

The first step is to compute the security and market returns. This is done in columns 4 and 5 of Table 7.2. We then used a spreadsheet programme on a PC to calculate the beta. The output from the computer was as follows:

Regression Output:

Constant	0.002049
Std Err of Y Est	0.023574
R Squared	0.362085
No. of Observations	383
Degrees of Freedom	381
X Coefficient(s)	1.245126
Std Err of Coef.	0.084669

The beta is nothing but the “X Coefficient” in the above output. The beta of ITC for the period is therefore 1.25.

We may also compute the expected return from the ITC share based on the above example. During the period January 1989 – October 1990, the market return was about 45% per annum, and the value of β was 1.25. Assuming that the risk-free rate of return is about 12%, we can use the CAPM equation to estimate the expected rate of return from the ITC share. This works out to about 53% per annum. Where such a high return may appear somewhat surprising at first glance, the fact remains that the period considered in estimating the return includes one of the more bullish phases in the Indian capital market history. Taking a much longer time period, say, five years or more, might have yielded a more realistic estimate.

Assumptions underlying CAPM

The Capital Asset Pricing Model (CAPM) is an equilibrium model. The derivation of the model is based on several assumptions about investors and the market, which we present below for completeness.

Investors are assumed to take into account only two parameters of return distribution, namely the mean and the variance, in making a choice of portfolio. In other words, it is

assumed that a security can be completely represented in terms of its expected return and variance and that investors behave as if a security were a commodity with two attributes, namely, expected return which is a desirable attribute and variance which is an undesirable attribute. Investors are supposed to be risk averse and for every additional unit of risk they take, they demand compensation in terms of expected return.

Again, the capital market is assumed to be efficient. An efficient market implies that all new information which could possibly affect the share prices becomes available to all the investors quickly and more or less simultaneously. Thus in an efficient market no single investor has an edge over another in terms of the information possessed by him since all investors are supposedly well informed and rational, meaning that all of them process the available information more or less alike. And finally, in an efficient market, all investors are price takers, i.e., no investor is so big as to affect the price of a security significantly by virtue of his trading in that security.

The Capital Asset Pricing Model also assumes that the difference between lending and borrowing rates are negligibly small for investors. Also, the investors are assumed to make a single period investment decisions. The cost of transactions and information are assumed to be negligibly small. The model also ignores the existence of taxes which may influence the investors' behavior.

The fact that some of the above assumptions are somewhat restrictive has attracted considerable criticism of the model. This, however, need not distract us from the main thrust of the model. The Capital Asset Pricing Model merely implies that in a reasonably well-functioning market where a large number of knowledgeable financial analysts operate, all securities will yield returns consistent with their risk, since if this were not so, the knowledgeable analysts will be able to take advantage of the opportunities for disproportionate returns and thereby reduce such opportunities. Hence, according to CAPM, in an efficient market, returns disproportionate to risk are difficult to come by. Assumptions concerning the investor behavior, market efficiency, lending and borrowing rates, etc. are to be taken not in such as taxes, transaction costs, etc. can be easily incorporated into the model for greater rigor.

Material for Group C

Asset Allocation and Portfolio Design

(Source: Book on Portfolio Management by Professors. S.K.Barua, V.Raghunathan and J.R.Varma)

When we talk of portfolio management, all of us think of equities. In this book too, we have tended to focus on equities except in the last chapter.

In reality, however, with the possible exception of the growth oriented mutual funds, it is rare to find a portfolio consisting entirely of equities. In many cases, equity is not even the largest component of the portfolio. For example, the country's largest and oldest mutual fund – UTI's Unit 64 – has, in recent years, kept a larger fraction of its portfolio in bonds than in shares. A substantial investment in bonds provides a stable source of income to balance the unpredictable fortunes of the equity portfolio.

While equities and bonds constitute the bulk of most investment portfolios, it would be a mistake to ignore the other components which though usually smaller are of vital importance. Usually, a small percentage (5% - 10%) of the funds is kept in cash or in highly liquid securities in the money market. The main purpose of these assets is to provide transaction flexibility to a portfolio manager. They allow him to buy some securities without having to sell some other scrip beforehand. Similarly, he may sell some scrips, and keep the proceeds in money market instruments while he identifies the scrips to buy. The investor who tries to eliminate money market instruments from his portfolio would have to balance his purchase and sale of securities on a day-to-day basis; this is usually utterly impractical. This transaction flexibility is not, however, the only role of money market instruments in the overall portfolio. We shall see later that there may be situations where an investor may keep an unusually large fraction of his funds in the money market.

Asset Classes

The typical investment portfolio then has three distinct components which we shall call asset classes:

1. Equities
2. Bonds
3. Cash and money market instruments.

We are free to add more asset classes to this list. For some investors, bullion may be an important asset class. In some cases, it may be useful to further divide the above asset classes into subclasses. Individuals in high tax brackets may regard tax free PSU bonds as a separate asset class distinct from corporate bonds. We can even think of subdividing the equity asset class into the forward and cash list because of their different liquidity characteristics.

In this chapter, however, we shall confine ourselves to the three asset classes listed above.

Strategic Asset Allocation

Asset allocation is the process of distributing the total portfolio over the asset classes. At the stage of asset allocation, we may, for example, decide to invest 60% of our funds in equities, 30% in bonds and 10% in money market instruments. Asset allocation does not, however, bother about what specific shares or which specific bonds should be bought with that 60% or 30%. That decision is left to be made in the second stage of portfolio selection.

In some ways, this is just a change of the level of analysis. While, so far, we have talked of the risk and return of individual securities, in asset allocation, we are talking of risk and return for an entire asset class. Some of the techniques that we have already discussed for individual securities can be applied directly to the asset allocation problem. For example, the Markowitz approach to portfolio selection can be applied at the level of asset classes by examining the historical data about the variances and covariance's of the returns of each asset class (Because of the smaller number of asset classes, the Markowitz approach is, in fact, easier to apply to asset classes than to individual securities!)

Overall Portfolio Beta and Duration

However, using the insights of portfolio theory, we can simplify the asset allocation problem even further. As far as equities are concerned, we know that:

1. The most important dimension of risk is the vulnerability of the scrip to the market factor. This risk is measured by the beta which represents the percentage change that can be expected in the scrip price when the market index changes by one percent.
2. All other sources of risk can be eliminated by holding a diversified portfolio of scrips so that losses in some scrip will usually be balanced by gains from other scrips. For this reason, investors should always seek well diversified portfolios.

As regards bonds we know that:

1. The most important source of risk is the changes in the interest rate. This risk is measured by the duration.
2. Individual bonds are also subject to default risk, but this risk is relatively less serious at the portfolio level.

This suggests that we can define the riskiness of the overall portfolio consisting of all asset classes by just two measures beta and duration. Asset allocation can therefore be carried out by deciding on the target beta and target duration and then maximizing the expected return subject to these constraints. Before we proceed to the problem of

deciding on the target beta and duration, let us first show how the overall portfolio beta and duration can be computed.

The beta of bonds and of money market instruments is negligible. Thus this risk affects only the equity portfolio. The beta of the total portfolio equals the beta of the equity portfolio multiplied by the proportion of the portfolio which is invested in stocks. For example, if 70% of the total portfolio is invested in an equity portfolio which has a beta of 1.2, the beta of the total portfolio is $0.70 \times 1.2 = 0.84$.

Interest rate risk on the other hand, affects not only bonds but also stocks. Changes in the interest rate do affect stock prices principally through a change in the Price/Earnings Ratio. It can be shown that for stocks

$$\text{Duration} = \frac{\text{Market Price (MP)}}{\text{Dividend per share (DPS)}} = \frac{1}{\text{Dividend yield}}$$

Where dividend yield equals DPS/MP . Since typically dividend yields are in the range of 3-4%, the typical duration of stocks is 25-30 years. Equity turns out to be the longest duration asset available in the capital market with a duration exceeding that of the long-term bonds.

Money market instruments are at the other end of the spectrum – their duration is virtually zero. Some of these instruments may have a duration of 6 months or so (for example, 182 day T-bills), but for all practical purposes, the average duration of the money market portfolio as a whole can be taken as nearly zero.

Once again, we can compute the duration of the total portfolio as the weighted average of the duration of its components. For example, if a portfolio is 30% equity, 5% in money market and 65% in bonds with average durations of 25 years, 0 years and 4 years respectively, the duration of the overall portfolio is $0.30 \times 25 + 0.05 \times 0 + 0.65 \times 4 = 10.10$ years.

Deciding the Target Beta

The most important consideration in deciding on the portfolio beta is the investor's attitude towards risk. The cautious investor who desires a stable source of income would usually choose a beta below one. On the other hand, the aggressive investor would want to seek out higher returns (at the cost of higher risk!), and would choose a beta above one. The most practical method of making such an assessment is to examine the behaviour of the stock market index for the last 10 years or so. The fluctuations in the market index shows how the value of our portfolio would have behaved if our portfolio had a beta of one. If we find that this degree of fluctuation suits us fine, we would normally choose a beta close to one. If, however, we feel that this degree of ups and downs in the portfolio value is unacceptably high, we should consider choosing a beta below one. On the contrary, we might find that this level of risk is not at all serious, and

might feel inclined to seek even higher returns by taking higher risk. In that case, we should choose a beta well above one.

Needless to say, in making this assessment about risk, we would have to consider the expected returns. We know that higher returns are associated with higher risk. During the last ten years, the average return in the market has been about 10% higher than the return on risk free securities. This means that the risk premium for a beta of one is about 10%. If our portfolio has a beta of 1.5, we can expect to earn a risk premium of 1.5 times the market premium, i.e., 15% over and above the risk-free rate of return. If our beta is only 0.8, the risk premium will be only 0.8 times 10%, i.e. 8%. Considering this risk return relationship in the light of our attitude towards risk, we can decide on the desired level of beta. This becomes the target beta as far as we are concerned.

Deciding the Target Duration

We have seen in Chapter 8 that if our holding period matches the duration of a bond, then the bond is not subject to interest rate risk. Clearly, therefore, the duration of the overall portfolio must equal our desired holding period.

But we must define the holding period more carefully than we have done so far. In our numerical examples in Chapter 8, we have assumed that the investor has cash need at only one point of time which also defines his holding period. In general, however, an investor or portfolio manager will have cash needs spread over a long period of time. For example, an investor may say that he has a horizon of 5 years, but he may want to use a large part of his interest income every year for his regular expenses. Similarly, a mutual fund may say that the scheme has a life of 5 years, but it too will have to distribute some dividends every year after defraying the management expenses. In both of these cases, there is a cash need every year in addition to the major cash need at the end of 5 years. How does duration matching apply to such investors? How do we define their holding period? The answer is to work out an average holding period taking into account the timing of all cash needs. It turns out that this average should also be a weighted average identical to the average which we used in the formula for computing duration. In other words, the investor must list out all his cash needs at various points of time, and compute the duration of this stream of cash flows in exactly the same manner as he computes the duration of a bond. This is his average holding period, and he must design a bond portfolio which has duration equal to this average holding period. For example, a mutual fund would have to estimate the annual operating expenses and income as well as the capital distribution at the end of the life of the scheme, compute the duration of this stream of cash flows and construct a portfolio with this duration. The general principle of duration matching can now be stated as follows: duration of assets must equal duration of liabilities, or duration of inflows must equal duration of outflows.

Example 1

Consider a Rs.100 Crores mutual fund floated on 01.01.1992 with a life of 7 years. The fund estimates that its annual outflow on account of dividends, operating and

management costs would amount to Rs.17.5 crores. Suppose that the rate of interest is 18%. What is the target duration for this mutual fund?

Solution

The target duration is the duration of the outflows calculated as follows:

Date	Outflow (Rs. Crores)	PV of Outflow at 18%	Year	PV X Year
01.01.1992	17.5	14.83	1	14.83
01.01.1993	17.5	12.57	2	25.14
01.01.1994	17.5	10.65	3	31.95
01.01.1995	17.5	9.03	4	36.11
01.01.1996	17.5	7.65	5	38.25
01.01.1997	17.5	6.48	6	38.90
01.01.1998	117.5	36.89	7	258.20
		98.09		443.37

Target Duration = $443.37/98.09 = 4.52$

We would like to add, however, that duration matching is not an end in itself. It is a powerful tool for protecting the bond portfolio from interest rate fluctuations, but some of us will want to assume part of the interest rate risk in the hope of getting higher returns. It is often true that assets with longer duration than our desired holding period offer higher returns. We will then have to decide whether this additional return is worth the extra risk that we assume. The extent of duration mismatch then becomes a measure of risk that we are taking. The investor's attitude towards risk thus plays an important role in deciding on the extent of duration mismatch and therefore the target duration of the overall portfolio.

Portfolio Design: Achieving Target Beta and Duration

We have already pointed out that the three main asset classes differ widely in terms of their duration and beta. Equities have high beta and long duration, bonds have negligible beta and moderate duration, and money markets have negligible beta and near zero duration. It is clear that by adjusting the proportion of these three asset classes in our portfolio, we can achieve a very wide range of values for the overall beta and duration. This range is even further enhanced if the investor can borrow and invest the borrowed funds in addition to his own funds. For example, if the investor borrows Rs.100 and adds that to his own funds of Rs.100 and invests Rs.200 in an equity portfolio with a beta of 1.00, his overall portfolio beta is actually 2.00. This is because his total portfolio is Rs.100 (Rs.200 of equities less Rs.100 of beta), and his equity portfolio is 200% of his total portfolio.

The other way to achieve the target beta and duration is to adjust the composition of the portfolios within each asset class. For example, we can say that while investing 90% of our portfolio in equities, we will choose our equity portfolio in such a way as to ensure an average beta of 1.25. This will give an overall beta of $0.9 \times 1.25 = 1.125$. Similarly while saying that we will invest a certain percentage of our portfolio in bonds, we can also say that we will choose long maturity bonds so as to obtain a duration of 5 years for the bond portfolio.

In case of institutional investors, it is not uncommon for each of the three asset classes to be managed by different individuals almost independently. In such cases, the asset allocation process is the crucial stage at which their actions are coordinated by taking an integrated view of the total portfolio. The person in charge of each asset class will be told not only what quantum of the total funds are being allocated to him, but also what is the average duration and beta expected from him. For example, the fact that a fraction of the total portfolio is invested in stocks increases the average duration of the total portfolio and allows the investor to have a lower duration for the bonds portfolio than if the entire portfolio were invested in bonds. To control the risk better, the bond portfolio manager needs to know the duration of the stock portfolio, and the equity portfolio manager needs to know that his actions may be changing the duration of the total portfolio. For some investors like pension funds and life insurance companies (which are, in India, in the public sector), the desired duration is far longer than what is available in bond markets. For them, the equity portfolio is the principal route to achieving high duration. We normally think of equities as being risky, here, however, equities become an instrument of risk reduction!

Example 2

How can an investor achieve target duration of 10 years if most corporate bonds have duration of only 5 years?

Solution

The investor will not want to invest in government bonds and other low-yielding securities even if they have a long duration. But he can use equities (which would have an average duration of about 30 years) to achieve his target duration as shown in the following asset allocation:

Asset Class	Duration	Percentage Allocation	Duration Times Allocation.
Corporate Bonds	5	80%	4
Equities	30	20%	6
Duration			10

In those cases where all three asset classes are being managed by the same individual, the process of asset allocation is not always as clearly differentiated from the second stage of

portfolio selection. Even here separating the process of strategic asset allocation helps in providing a long-term perspective and an integrated view of the total portfolio.

Portfolio Design: Target Return Approach

In portfolio design, we are essentially concerned with the tradeoff between risk and return. There are several ways of handling this tradeoff which though apparently different are ultimately equivalent. We can, as suggested in the previous paragraphs, decide on the target level of risk that we are willing to take and then try to achieve the highest level of return that is possible without exceeding this risk level. Alternatively, we can reverse the logic completely: we can start with a target rate of return and try to keep the risk as low as possible while still attaining the chosen return objective. A moment's reflection will show that these two approaches are only different sides of the same coin.

But there are several situations where an investor may find it easier to specify a target rate of return than a target risk level. An obvious example is that of a mutual fund which has promised a certain rate of return to the unit holders. This return plus the management and operating costs becomes the target rate of return for the fund managers who will then try to seek the lowest risk route to achieving this target return. Similarly an investor who is saving for a specific purpose will often have a target amount that he wishes to have at the end of his holding period. He may, for example, want to have Rs.25 lakhs on his retirement. From this, he can work out what target return he must achieve to reach this wealth level given his estimated savings potential.

Asset allocation determines the expected rate of return on the total portfolio to a great extent because the three asset classes have very different levels of expected return. Equities are expected to earn more than bonds which in turn probably earn more than money market instruments. (Of course, the three asset classes rank the same way in terms of risk also). To achieve a target rate of return, therefore, we have to weight our asset allocation in favor of higher yielding asset classes (for example, more equities and less bonds).

Another way to achieve a higher target return is to skew the portfolio within an asset class in favor of higher return assets. An equity portfolio with a beta of 1.2 would earn approximately 2% more than the average equity portfolio with a beta of 1.0 (of course at the cost of higher risk). Similarly, in case of bonds, bonds of long maturity often have higher yields than short-term bonds. We may decide to choose these bonds even if it implies a duration mismatch and higher interest rate risk.

Yet another possibility of earning higher returns arises from superior portfolio selection. We shall be discussing tactical asset allocation and portfolio selection later in this chapter. We shall see that investors who have special skills can enhance their return by performing these tasks better. For instance, investors who are very good at identifying good scrips which are temporarily undervalued can include such scrips in their equity portfolio and hope to get returns higher than the average returns of equities as a whole.

This ability may allow them to invest a smaller percentage of their total portfolio in equities and still earn their target rate of return.

Tactical Asset Allocation

Portfolio Revision

At the stage of strategic asset allocation, we determine a target beta and duration for the total portfolio and decide how the portfolio is allocated among asset classes to achieve this objective. That is not, however, the end of the matter.

The first complication that arises in managing the risk of the total portfolio is that the relative weights of the equity and bond portfolio in the total portfolio can change because of a change in market values. For example, if there is a boom in share prices, the equity portfolio rises sharply in value, and its weight in the total portfolio also increases. This immediately changes the average beta of the total portfolio though the investor has not altered the composition of the portfolio. Similarly, the average duration is also affected. If he wants to maintain the old beta and duration, he will have to rebalance his portfolio. Similar problems can arise if interest rates rise causing a sharp drop in the value of the bond portfolio changing its weight in the total portfolio.

Example 3

Consider the asset allocation of Example 9.2. What happens to the overall beta and duration if there is a boom in the stock market and equity prices rise by 50%?

Solution

Asset Class	Original Percent	Original Value	Current value	Current percent
Bonds	80	80	80	73
Equities	20	20	30	27
Total	100	100	110	100

The average duration of bonds was 5 years and of equities 30 years. We shall assume that the average beta of the equities was 1.0. We assume for simplicity that the boom in share prices has not changed the duration or betas of our equity portfolio.

$$\text{Original duration} = 5 \times 80/100 + 30 \times 20/100 = 10 \text{ Years}$$

$$\text{Original beta} = 0 \times 80/100 + 1 \times 20/100 = 0.20$$

$$\text{Current duration} = 5 \times 73/100 + 30 \times 27/100 = 11.75 \text{ years}$$

$$\text{Current beta} = 0 \times 73/100 + 1 \times 27/100 = 0.27$$

Example 4

Consider the asset allocation of Example 2. What happens to the overall beta and duration if there is a sharp rise in interest rates and bond prices drop by 20%?

Solution

Asset class	Original percent	Original Value	Current value	Current percent
Bonds	80	80	64	68
Equities	20	20	30	32
Total	100	100	94	100

The average duration of bonds was 5 years and of equities 30 years. We shall assume that the average beta of the equities was 1.0. We assume for simplicity that the rise in interest rates has not significantly changed the average duration of the bond portfolio.

$$\text{Original duration} = 5 \times 80/100 + 30 \times 20/100 = 10 \text{ Years}$$

$$\text{Original beta} = 0 \times 80/100 + 1 \times 20/100 = 0.20$$

$$\text{Current duration} = 5 \times 68/100 + 30 \times 32/100 = 13 \text{ years}$$

$$\text{Current beta} = 0 \times 68/100 + 1 \times 32/100 = 0.32$$

The second question is more fundamental. Does the choice of a target beta mean that we should always maintain our portfolio beta at this target value? Not necessarily. Our portfolio beta should hover around this target value, but, in the short run, it may deviate quite substantially from this target value. If, for example, we feel that a slump in the market is around the corner, we might want to temporarily switch over to a defensive portfolio which provides us some protection in case of such a slump. A defensive portfolio is a portfolio whose beta is low (less than one); since beta measures the vulnerability to market risk, such a portfolio suffers less loss when the market slumps. Obviously, when we switch over to such a defensive portfolio, our beta will be below our target value. But this position is temporary; at the earliest opportunity, we would try to restore it to our target value. Correspondingly, if we accept a boom in share prices, we might temporarily switch over to an offensive portfolio. An offensive portfolio is a high beta portfolio (beta above one) which is very sensitive to the market index and, therefore, appreciates greatly when the market booms.

To summarize, therefore, our attitude towards risk determines our target beta, i.e. the long run value of beta around which our portfolio beta would tend to fluctuate. Our view of the market would determine the short run fluctuations in the portfolio betas as we switch to offensive or defensive portfolios to exploit anticipated market movements in the short run. In exactly the same way, our view about the likely changes in interest rates can cause us to temporarily change the overall duration beta and duration of our total portfolio.

This temporary realignment of portfolio beta and duration in response to changing market values or to our view of the market is the province of tactical asset allocation. Since shifts of portfolio betas are much more common than shifts of portfolio duration, we shall, in this chapter, focus on beta shifts. But many of the same principles apply to shifts of duration also.

Market Timing

It is obvious that switching to offensive and defensive portfolio according to our view of the market trends is subject to a great deal of risk. If the market moves down when we are holding an offensive portfolio because we expected the market to rise, we stand to lose heavily. This is because an offensive portfolio drops even more rapidly than the market. Similarly, if the market rises while we are holding a defensive portfolio in the expectation of a slump in prices, we suffer an opportunity loss. A defensive portfolio does not rise as fast as the market does and we lose out on the gains that we could have made. This means that the switching of portfolio beta must be done with great care. How far we are willing to go in moving away from our target beta depends on the degree of confidence that we have in our forecast of market trends. Unless we are very confident about our forecasts, we would be well advised to stick to our target beta.

From a practical point of view, the important question is how we implement the temporary shifts in the portfolio betas. For example, suppose we want to temporarily adopt a defensive portfolio (with say a beta of 0.6) with the intension of reverting to our target beta (of say 1.1) in the near future. What options do we have? We could consider the following possibilities:

1. Switch a part of the portfolio to bonds (debentures), i.e. sell a part of our equity portfolio and invest the proceeds in debentures.
2. Switch a part of the portfolio to money market instruments. This could include the unorganized money market; for many brokers, it is more convenient to invest excess funds in the badla finance market. Of course, the risks involved in operating in the unorganized market are quite different from that involved in the organized markets.
3. Reduce the average beta of the equity portfolio by selling high beta stocks and buying low beta stocks.
4. Short sell high beta stocks.

All the above do succeed in creating a defensive portfolio and can be regarded as equivalent in this sense. But in practice, there are important differences in these options:

1. Transaction costs (brokerage, etc.) are different in these alternative routes: these costs are typically lower in the forward market.

2. Change over to bonds or to money market instruments can change the duration of the portfolio and change our exposure to interest rate risk.
3. Short selling may be prohibited for some investors (e.g. mutual funds). Even otherwise, it is subject to other risks (backwardation charges).
4. Rebalancing the portfolio to reduce its beta must be done with some care; if the portfolio becomes concentrated in a few low beta stocks it becomes less diversified. This means that rebalancing will have to be done by selling a broad range of high beta stocks and buying a broad range of low beta stocks involving higher transaction costs.

For these reasons, the switch to a defensive portfolio would typically involve simultaneous recourse to several, may be all, the above techniques of beta reduction. Similarly, a switch to a high beta portfolio may require simultaneous recourse to several options: switch away from bonds and money market instruments to stocks, borrow and invest in stocks, rebalance the portfolio in favor of high beta stocks, maintain an overbought position in the forward market.

This analysis places the money market asset class also in a new light. Since it has very low beta and duration, this asset class can be used very effectively as an instrument for changing the duration and beta of the total portfolio in response to changing needs. The money market portfolio is one of the instruments for shifting temporarily to a defensive portfolio. It can also play an important role in rebalancing the beta and duration of the portfolio quickly in response to the change in market values discussed earlier in this section. Here too the money market portfolio is used temporarily in a balancing role while a more permanent rebalancing is worked out. The important point, however, is that the money market portfolios is not seen as just as a repository of idle cash; it is market portfolio is not seen as just as a repository of idle cash; it is an active element in the management of the risk of the total portfolio.

Formula Plans

The management of the temporary changes in portfolio beta and duration by adjusting its composition is known as tactical asset allocation. A number of mechanical rules have been evolved to simplify this process. These rules seek to replace the subjective judgment of the investor by 'formulas'. Their principal advantage is that they are completely unemotional; they prevent the investor from being swayed by sentiment and thereby getting into a very risky position.

The two most popular 'formula plans' are the *Constant Ratio Plan* and the *Constant Value Plan*. As the name suggests, the constant ratio plan tries to keep a certain constant percentage of the portfolio in equities. For example, the plan may specify that 60% must be in equities and allow a 5% band for fluctuations. This means that if equity prices rise and the equity portfolio rises to 65% of the total, then we must sell equities to bring the ratio down to 60%. Similarly, if equity prices fall and the ratio drops to 55%, then we

must buy equities to bring the ratio up to 60%. The width of the band clearly determines the extent of trading that takes place. If we set too narrow a band, we will be buying and selling at almost every fall or rise in the market index and we will make money only for our broker. If we set too large a band, we can stray too far away from the desired ratio.

The constant value plan on the other hand demands that a constant value be invested in equities. We might start with a portfolio of Rs.100 with Rs.60 in equities and Rs.40 in bonds. The constant value may say that we must have Rs.60 in equities with a band of Rs.5 to bring it up to Rs.60. This is more stringent than the earlier example of the constant ratio plan; if equities have dropped to Rs.55 and bonds are unchanged at Rs.40, then the total portfolio is only Rs.95 and the ratio is $55/95 = 58\%$. This is higher than 55% and the constant ratio plan will not be triggered.

Several modifications and combinations of these two plans are also available for those who seek to make tactical asset allocation almost automatic. The better way of looking at these plans is as aids to our judgment. Rather than blindly follow these plans, we should treat the recommendation of these plans as buy and sell signals which we evaluate using our judgment and view of the market.

Portfolio Insurance

In western capital markets, there is an alternative to defensive portfolios if one wants protection against market slumps. Known as portfolio insurance, this technique lets the investor protect himself against downward movements in prices while continuing to benefit from upward movements. There are two routes to portfolio insurance:

1. In developed economies, there are options markets where the investor can buy put options. The put option allows the investor the right but not the obligation to sell a security at a prespecified price at a prespecified date. If the market goes down, the investor exercises the put option to get out of the scrip without much loss. If the price goes up, the option is not exercised, and the investor can obtain the benefit of the higher price. In India, organized options markets do not exist as of now, but there is a distinct possibility of their being permitted in the next few years. What is available in India is an informal teji-mandi market in which a narrow range of very short term options are traded. This market is unlikely to be of much use for portfolio insurance purposes.
2. The second route to portfolio insurance does not use options markets, but relies on a dynamic hedging strategy implemented using program trading. This method typically involves using a computer program to generate trades designed to artificially replicate the effect of a put option. Program trading has come under a cloud in the United States after the crash of October 1987. In any case, its practicability and efficacy in Indian conditions has never been demonstrated.

At present, the technique of portfolio insurance is not, therefore, available to Indian investors who will, for some time to come, have content themselves with the simpler method of defensive portfolios.

Scrip Selection

Having determined the desired beta of our equity portfolio, the next task is that of constructing a well-diversified portfolio with that level of beta. In theory, the most perfectly diversified portfolio is the one which contains every security traded in the stock market. Such perfection, however, is only an ideal, not to be achieved in real life¹. In practice, one needs a much smaller number of securities to achieve a very high degree of diversification: 15-20 securities may often be adequate, though large institutional investors may use 40-100 securities. But care must be taken to ensure that the securities one chooses are spread over several industries. Excessive dependence on any one business group or geographic region must also be avoided. Within these limits, the investor has considerable leeway in choosing a diversified portfolio.

In addition to diversification, there are two other factors to be considered in designing a portfolio. First is the issue of market timing to which we have devoted a section earlier. Market timing requires us to temporarily shift to offensive or defensive portfolios depending on our view of the market. Second, in the chapters on fundamental and technical analysis, we have discussed the various methods that analysts use to determine whether a stock is under or overvalued. One expects undervalued stocks to rise and overvalued. One expects undervalued stocks to rise and overvalued stocks to fall as the market corrects itself. Obviously, scrip selection must use this information. The undervalued stocks are to be sought and the overvalued one is to be shunned. But again there is a danger: the analyst may identify two or three stocks that are very good buy and may invest heavily in them. The resulting portfolio may be very poorly diversified. This is a danger that portfolio theory teaches us to avoid.

To see how these two factors influence the scrip selection problem, we now look at four types of investors and examine the portfolio design approaches suitable for each of them.

¹ In many foreign capital markets, it is possible to buy index contracts which give the investor the same return as what he would have got by investing in the entire market portfolio. Index contracts are not available in India, but some investors use UTI Mastershares and similar instruments as surrogates for an index contract.

Type A Investor: No Market Timing and No Stock-picking Skills

If the investor does not believe that he has any special skills in picking undervalued stocks or in predicting the movement of the market, then the portfolio design problem becomes relatively simple. The investor simply chooses a diversified portfolio (in the manner described above) and then adjusts its beta to the desired level. If he weights the chooses securities in proportion to market capitalization, he can expect to get a portfolio beta close to one. To achieve a higher or lower beta, he can shift the weights towards high or low beta stocks. He can achieve the same effect by increasing or decreasing the allocation to the equity portfolio in the overall portfolio.

The type A investor would hold a passive, diversified portfolio with a constant beta equal to the target beta. He may also prefer to invest his money in a mutual fund and let it do the portfolio management for him.

Type B Investor: Only Stock-picking Skills

An investor who has and wishes to exploit his stock picking skills should start with a base portfolio similar to that of the type A investor. He should then adjust the weights of the stocks which are in his opinion mispriced. Specifically, he should overweight the stocks which are overvalued and underweight those which are under valued. For example, the base portfolio may have 2% in Stock X and 1.5% in Stock Y. The investor who finds X undervalued and Y overvalued may change the weights to 3% to X, he may have a problem as he would then have to shortsell Y to the extent of 0.5% of the portfolio. This may not be legally or practically possible. The investor then has to raise the weight of X to 4%, eliminate Y from the portfolio and reduce the weight of some other stocks by 0.5%.

The investor can deal with this problem in a slightly different manner. He can put, say 90%, of his equity investment in the diversified portfolio and reserve the remaining 10% for the mispriced stocks. How large a fraction he should devote to mispriced scrips depends on how good analyst may choose a larger fraction? What we are doing in this decision is to balance the profit potential of investing in undervalued stocks against the benefit of diversification. Unless we are confident about our analysis, we should give primacy to the need for diversification.

Since the average beta of the undervalued and overvalued stocks is likely to be close to one, the overall beta is likely to remain close to the target value, unless the target beta is substantially different from one and the percentage of the portfolio devoted to mispriced stocks is large. If, for some reason, this is not so, the investor would have to take further action to maintain the beta at the target value. The portfolio of the type B investor is concentrated but has a constant beta.

Type C Investor: Only Market-timing Skills

The type C investor holds a well-diversified portfolio but switches actively between defensive and offensive portfolios to take advantage of the market timing. If he expects the market to rise, he should push his portfolio beta above his target level by any of the techniques described in the section on market timing. The converse should be done if the investor is bearish about the market. In either case, the portfolio would remain diversified all through. The portfolio of this investor is diversified, but its beta is managed and not constant.

Type D Investor: Both Stock-picking and Market-timing Skills

This type of investor would use the techniques used by both the type B and Type C investor. These investors would have the most active and aggressive portfolio management strategies. Using their superior ability to predict booms and busts in the market as a whole and their skills in identifying undervalued scrips, they should hold highly concentrated portfolios and let the beta fluctuate quite sharply around the long run target value.

A pitfall to be very strenuously avoided is that of assuming that one has a skill which one is reality does not have. For example, an investor who does not have very good abilities in scrip selection may still think that he does have such skills. He would then end up with an ill-diversified portfolio which earns mediocre returns; he would have been better off with a passive portfolio.

Bond Portfolio Selection

The bond portfolio design problem consists of choosing a mix of bonds which has the desired duration and provides the highest YTM. Of course, this must be done keeping in mind the default risk of the bonds also.

There are two distinct ways in which default risk can be taken into account in designing the bond portfolio:

1. The legalistic approach establishes a minimum rating which a bond must have to be included in the portfolio. Many bond portfolio managers throughout the world operate under such explicit or implicit restrictions which prohibit them from investing in low grade bonds.
2. The more sophisticated approach looks at the average quality of the bond portfolio. The overall risk aversion of the investor determines the desired average quality of the total portfolio. But it is not necessary that all bonds be of this quality. Some lower grade bonds may be bought if the rest of the portfolio is of sufficiently higher grade to maintain the average quality.

The second approach requires greater skill and effort, but it provides the route to higher returns. It allows the investor to choose the mix of bonds which provides the highest YTM while still achieving the target quality level.

Thus the bond portfolio selection problem has three aspects:

1. The portfolio duration must equal the duration of the outflows.
2. The average quality of the portfolio (in terms of the credit rating) must not fall below the acceptable level.
3. Within these two constraints, the high yielding bonds must be chosen to maximize the YTM of the portfolio

All this does not eliminate the need for active management of the bond portfolio. Duration matching eliminates the interest rate risk, but it is a continuous process rather than a one shot activity. There are several reasons why the duration of a portfolio may change:

1. Duration wandering is a phenomenon in which as time passes, the duration of a portfolio changes slowly.
2. Large changes in interest rates can change the duration.
3. Normal trading activity in the portfolio may change its duration.

To take care of all these factors, it is necessary to recompute the portfolio duration at frequent intervals. Whenever a substantial discrepancy is found, steps must be taken to rebalance the portfolio to achieve the desired duration.

Finally, Just as in the case of equity portfolios we can shift the beta temporarily to exploit our forecast of market trends, we can temporarily change the duration of our bond portfolio to take advantage of our forecasts of interest rate trends. If we expect interest rates to rise, we must switch towards low duration assets. Conversely, a switch to high duration assets is mandated if we expect interest rates to fall.

Material for Group D

Evaluation of Portfolio Performance

(Source: Book on Portfolio Management by Professors. S.K.Barua, V.Raghunathan and J.R.Varma)

In this book, we have, so far, discussed how to design and revise our portfolios. What remains now is the bottom line – how well has the portfolio done? This chapter deals with the evaluation of portfolio performance.

There are a number of situations in which such an evaluation becomes necessary and important:

1. *Self Evaluation* As individuals, we might want to evaluate how well we have done. This is a part of the process of refining our skills and improving our performance over a period of time.
2. *Evaluation of Managers* A mutual fund or similar organization might want to evaluate its managers. A mutual fund may have several managers each running a separate fund or sub-fund. It is often necessary to compare the performance of these managers.
3. *Evaluation of Mutual Funds* As investors, we may want to evaluate the various mutual funds operating in the country to decide which, if any, of these should be chosen for investment. Similar need arises for individuals or organizations who engage external agencies for portfolio advisory services.
4. *Evaluation of Groups* As academics or researchers, we may want to evaluate the performance of a whole group of investors and compare it with another group of investors who use different techniques or who have different skills or access to different information.

While these situations differ in the objective of evaluation and in the extent of information available, the general method of evaluation is the same for all of them. The discussion in this chapter would be of use in all these situations. We shall use the term portfolio manager to refer to the person responsible for taking decisions regarding the portfolio. In the case of self evaluation discussed above, the investor should for the purpose of this chapter be regarded as his own portfolio manager.

Need for the Portfolio View

One can think of evaluating performance at three different levels of aggregation:

1. We can try to evaluate every transaction. Whenever a security is bought or sold, we can attempt to assess whether the decision was correct and profitable.
2. We can try to evaluate the performance of a specific security in the portfolio to determine whether it has been worthwhile to include it in our portfolio.

3. We can try to evaluate the performance of the portfolio as a whole during the period without examining the performance of individual securities within the portfolio.

In practice, it is quite common to find people use the transaction view or the security view while evaluating themselves or their subordinates. However, these methods though intuitively appealing are inadequate and often misleading. Consider, for example, a hypothetical situation where we are sitting in the trading room watching two portfolio managers place sell orders. A is selling stock X for Rs.80; he tells us that he bought the stock a month ago at Rs.64. Mentally, we make a quick calculation: A has made a return of 25%. Meanwhile, B is selling stock Y for Rs.72; this stock had cost him Rs.60 a month ago. We calculate that the return is only 20%. We decide that A has done better than B but keep our thoughts to ourselves. We come back to the trading room a month later to find on PTI-SCAN that stock X is now selling at Rs.90 and stock Y at Rs.55. B walks up to us and tells us how right he was to sell the stock before it started falling. We then turn to A to remind him that stock X has risen 12.5% since he sold it. He nonchalantly tells us that he has not been keeping his money idle and that his recent acquisitions have appreciated even more steeply. We are left wondering whether this is just a case of sour grapes or whether A has really been doing well.

If we think through this example carefully, we will realize that the important notion is that of opportunity costs. The book profits that A and B made when they sold their respective stocks is easy to calculate. The difficulty arises with opportunity costs. By selling stock X when it was still rising, A has missed the opportunity to earn an even higher return than he did. B, on the other hand, has avoided a large opportunity loss by selling just before the stock fell. The opportunity cost becomes tricky when A tries to argue that he has not suffered an opportunity loss at all because the stocks that he bought after selling X have done equally well if not better. A's argument, in fact, strikes at the very root of the transaction view. He is telling us not to look at the transaction in isolation, but to look at his portfolio in its entirety.

We shall shortly turn to the portfolio view, but the notion of opportunity costs is an important one for all portfolio managers. There is a deep-rooted tendency among most investors to ride their losses and book their profits. They feel comfortable selling a stock on which they are making a book profit. They feel uneasy selling a stock if it means incurring a book loss, and, therefore, tend to carry the stock in their portfolio in the hope that it will some day appreciate in value. This argument is totally fallacious. In the process of avoiding a book loss now, they may incur a large opportunity loss; in other words, the stock may decline further causing an even greater loss in future.

The notion of opportunity loss has helped us realize the advantage of the portfolio view. There is a second major reason for taking the portfolio view, and that is the issue of risk. We know very well that higher return can be had if we are willing to accept higher risk. When we say that A earned a return of 25% on stock X while B earned 20% on stock Y, we need to look at the riskiness of these securities to evaluate these returns. The

difficulty is that risk is best defined at the portfolio level not at the security level. We know that a large part of the riskiness of a security can be diversified away by holding it in a well-designed portfolio. As we saw in the previous chapter on portfolio design, however, investors who seek out underpriced stocks may end up with poorly diversified portfolios. To evaluate the return that they make, we must examine the riskiness of the total portfolio.

Time Horizon for Portfolio Evaluation

Having decided to evaluate performance at the portfolio level rather than at the security or transaction level, it remains to decide the time interval over which the evaluation is to be done. We are often tempted to evaluate at very frequent intervals in the belief that this will help in taking prompt remedial action. If we evaluate only once in five years, it may be too late to do anything with the evaluation. Nevertheless, there may be strong reasons for not evaluating a portfolio at too short an interval. Firstly, all portfolio managers have an investment horizon. Those who have a long horizon may buy a stock on its long-term fundamentals even if its short-term outlook is bleak. To evaluate these managers on a short horizon is, therefore, unfair and misleading. Secondly, no portfolio manager expects to be right all the time. He expects to make errors, but expects to be right often enough to achieve a good return overall. Over a reasonably long horizon, his windfall gains and losses cancel each other out and the actual return can be regarded as a reasonable measure of his performance. But, in the short run, this is not necessarily true, and the actual return may not be really representative. For these reasons, the time horizon for performance evaluation should be at least two years; ideally, it should be a little longer to include one cycle of boom and bust in the stock market.

Risk and Return

Measuring the actual return on a portfolio during a short period, say one year, is quite straight forward. The total return equals the capital appreciation of the total portfolio (including cash and money market instruments) plus the income and capital distributions out of the portfolio during the period less the capital infusions into the portfolio. The capital appreciation of the portfolio is computed by valuing the portfolio at market prices at the beginning and end of the period and calculating the growth in value. Over a long period of time, the return has to be computed with greater care as the timing of cash flows cannot be ignored.

Example 1

Mr. A began investing in securities on 01.01.1991 with an initial investment of Rs.25 lakhs. During the course of the year he received interest and dividends of Rs.1.5 lakhs which he utilized for his personal expenses. In the latter part of the year, he also sold shares worth Rs.5.0 lakhs to finance part of the cost of a house that he was building. On 31.12.1991, Mr. A finds that his shares are worth Rs.23 lakhs and that he also holds debentures worth Rs.5.5 lakhs. What is the return earned by him during the year?

Solution

	Rs. lakhs
Portfolio Value as on 31.12.1991	28.50
Portfolio value as on 01.01.1991	25.00

Appreciation in value	3.50
Add interest and dividends withdrawn for	
Personal use	1.50
Capital withdrawn for house construction	5.00

Total Return Earned	10.00
	=====

Percentage Return = $10.00/25.00 = 40\%$

The actual return has to be evaluated by comparison to a benchmark taking risk into account. The benchmark rate of return is that of the market as a whole which represents the average performance of all investors taken together. Superior performance then means performing better than the market index after adjusting for risk. The different methods of evaluating portfolio performance that we shall discuss below differ mainly in the method used for adjusting for risk.

The total risk of a portfolio is measured by the variance or the standard deviation. We have seen earlier in this book that this total risk can be broken up into systematic risk and unsystematic risk. The unsystematic risk can be eliminated by holding a diversified portfolio. On the other hand, the systematic risk measured by the beta cannot be diversified away because it represents the vulnerability to market fluctuations.

Reward per Unit of Risk

One natural way of adjusting for risk is to look at the reward per unit of risk. This was exactly what Sharpe and Treynor proposed in their pioneering work on evaluation of portfolio performance. But, while Sharpe chose the standard deviation (total risk) as the measure of risk, Treynor used the beta (systematic risk) as his measure of risk.

We know that the risk-free rate of interest is the return that we can earn without bearing any risk. The risk premium is the return earned over and above the risk-free rate and is the reward earned for bearing risk. We can, therefore, divide the risk premium by a measure of risk to get the risk premium per unit of risk. The higher this ratio, the better the portfolio has done; if we compute the performance measure for a number of portfolios, we can rank these portfolios according to their performance. The Sharpe and

Treynor measures are quite similar in these respects; they, however, differ in their definition of risk.

Treynor defines risk as being the unsystematic risk or beta. His measure of performance is the risk premium per unit of systematic risk (beta). To compute this measure, we must first estimate the beta of the portfolio. This is done in exactly the same way as for individual securities as described earlier in this book. Then we divide the risk premium by the beta to get the Treynor measure.

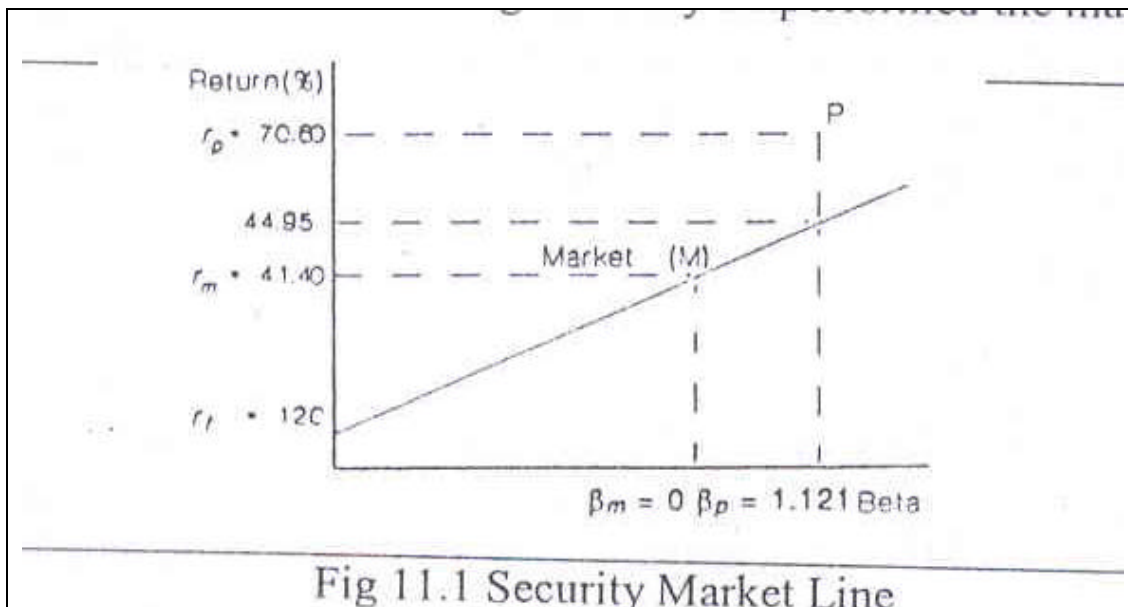
Example .2

Mr. P has been managing the portfolio of a large mutual fund for the last two years. He found that his portfolio had earned a return of 70.60% and had a beta of 1.121. During the same period, the return on the market as a whole was 41.40%. Assuming that the risk-free rate was 12%, compute the Treynor measure for the portfolio and comment on P's performance according to this measure. Show the result graphically.

Solution

The risk premium for P's portfolio is $70.60 - 12.00 = 58.60$. The Treynor measure is therefore $58.60/1.121 = 52.3\%$.

To comment on how well P has done, we compare this value of 52.3% with the Treynor measure for the market. Since the market, by definition, has a beta of 1.0, its Treynor measure is $(41.40 - 12.00)/1.0 = 29.4\%$. This means that P has earned 52.3% per unit of risk borne while the market as a whole earned only 29.4% per unit of risk borne. This makes it clear that P has significantly outperformed the market.



As stated earlier, Sharpe argued that the appropriate measure of risk is not the systematic risk (beta) but the total risk (standard deviation). The Sharpe measure of performance is, therefore, the risk premium earned per unit of total risk. To compute this measure, we must first compute the standard deviation of the returns and divide the risk premium of the portfolio by its standard deviation.

Example 3

Mr. P of Example 2 finds that the standard deviation of returns on his portfolio is 41.3% while that of the market as a whole is 19.44%. Compute the Sharpe measure for P's portfolio and comment on his performance according to this measure. Portray the result graphically.

Solution

As in example 2, the risk premium earned by Mr. P is 58.60%. The Sharpe measure of his portfolio is $58.60/41.31 = 1.418$.

For the market, the Sharpe measure is $(41.40 - 12.00)/19.44 = 1.512$. The Sharpe measure thus indicates that P has not done as well as the market.

We portray the situation graphically, plotting return on the vertical axis and total risk on the horizontal axis. The line joining the risk-free rate to the market (M) is the Capital Market Line discussed earlier in the book. It indicates the relationship between return and total risk for all well-diversified portfolios. It can be seen that P's portfolio lies below the CML indicating that it has earned less than what is required for its level of total risk.

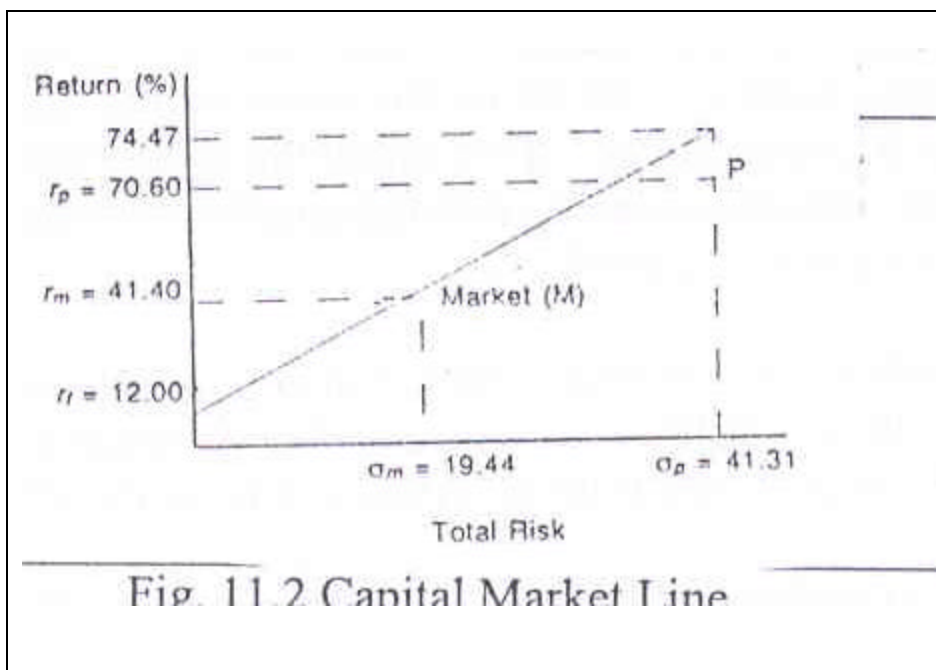


Fig. 2 Capital Market Line.

Why do the Sharpe and Treynor measure give opposite results in the case of Mr. P? The reason is that P's portfolio has a disproportionate amount of unsystematic risk; it looks like a poorly diversified portfolio. Hence a measure which uses total risk gives a result very different from one which uses only systematic risk. What do we do in a situation like this? Does it mean that one of the measures is wrong? The answer is that both measures are right, but they are relevant in different contexts. In our situation where the portfolio is a mutual fund, the appropriate measure to use depends on the type of investor. For those investors who use P's mutual fund as the principal vehicle for investment in equity, there is no scope for diversifying away the large unsystematic risk. The relevant measure is the Sharpe measure which indicates that P has not done as well as the market. On the other hand, consider an investor who holds a large portfolio of shares and is considering adding some units of P's fund to it just as if it were another security. For this investor, the large unsystematic risk of the fund does not matter. It will be diversified away when it is included in the investor's total portfolio. For such an investor, what is relevant is the systematic risk which cannot be diversified. The Treynor measure is appropriate for this investor and this measure indicates that the mutual fund is very attractive having significantly outperformed the market.

In general, we can say that to measure the performance of the total portfolio of an investor, the Sharpe measure is always the right one. To measure the performance of a sub-portfolio, the Treynor measure is correct provided the investor has taken reasonable care to ensure that his total portfolio is well diversified.

In practice, however, in a large number of cases, the Sharpe and Treynor measure of performance produce very similar rankings of portfolios; typically, therefore, they agree on whether a particular portfolio has done better than the market or not. The situation of disagreement which we found for P's portfolio is the exception rather than the rule.

Excess Returns

The Sharpe and Treynor measures of performance are both ratios. This means that though they can be used to rank portfolios, they are not readily interpretable in monetary terms or in terms of percentage returns. Often, we would like to measure a portfolio's superior performance in terms of the extra return that it has earned beyond what was mandated by its level of risk. If we know the size of the portfolio, we can then convert this into a rupee amount as saying that the portfolio manager's efforts were worth so much of money in extra return earned.

This kind of performance measurement is also possible using the SML and CML diagrams that we have shown in Examples 2 and 3 what we are now looking at is the vertical distance of the portfolio from the SML and from the CML.

If we take beta or systematic risk as the appropriate measure of risk, then the SML indicates the return that a portfolio should earn for any given level of risk. The difference between that and the actual return is a measure of the excess return that has been earned over and above what is mandated for its level of systematic risk. This performance measure is known as Jensen's measure after its originator.

Example 4

From fig 1 and the data in Example 2 compute the Jensen measure of P's performance.

Solution

In Fig. 1 we see that portfolio P's beta of 1.121 mandated a return of only 44.95% while its actual return was 70.60%. P, therefore, lies above the SML, and the vertical distance from the SML to P is 25.65% (i.e. $70.60 - 44.95$). This is the excess return (Jensen measure) that P has earned after adjusting for systematic risk.

We can compute the Jensen measure numerically without drawing a graph, as follows. We multiply the beta of the portfolio by the risk premium of the market and add the result to the risk-free rate to get the return mandated by the SML. For portfolio P this gives $12.00 + 1.121(41.40 - 12.00) = 44.95\%$. The Jensen measure is then found by subtracting this return from the actual return on the portfolio: $70.60 - 44.95 = 25.65\%$.

The Jensen measure was based on systematic risk and therefore looked at the SML. If we are interested in total risk we can look at the distance from the CML instead of from the SML. The vertical distance from the portfolio to the CML is Fama's measure of net selectivity. It represents the excess return earned over and above the return required for its level of total risk.

Example 5

From Fig 2 and the data in Example 3 compute the Fama measure of net selectivity for P's performance.

Solution

In Fig 2, we see that portfolio P's total risk of 41.31% mandated a return of 74.47% while its actual return was 70.60%. P, therefore, lies below the SML, and the vertical distance from the SML to P is -3.87% (i.e. $70.60 - 74.47$). This is the Fama measure of net selectivity for P. Since it is negative, P has underperformed the market by 3.87%.

We can compute the Fama measure of net selectivity numerically without drawing a graph as follows. We first compute the ratio of the standard deviation of the portfolio to that of the market. For P's portfolio this ratio is $41.31/19.44 = 2.125$. We then multiply this ratio by the risk premium of the market and add the result to the risk-free rate to get the return mandated by the CML. This gives $12.00 + 2.125(41.40 - 12.00) = 74.47\%$.

The Fama measure of net selectivity is then found by subtracting this return from the actual return on the portfolio:

$$70.60 - 74.47 = - 3.87\%.$$

Again the two measures (Jensen and Fama's net selectivity) give opposite results. The reason for and the interpretation of this divergence is exactly the same as that for the divergence between the Sharpe and Treynor measures. In other words, Fama's net selectivity measure is appropriate in cases where the portfolio under question is the total portfolio of the investor. Jensen's measure is appropriate when we are looking at sub-portfolios of a larger (well-diversified) portfolio.

The Fama approach can be used to give a complete break-up of the observed return in terms of its various components. For P's portfolio, this break-up will be as follows:

1. Risk-free return	12.00%
2. Compensation for systematic risk(beta)	
1.121 (41.40 – 12.00)	32.95%
3. Compensation for inadequate diversification	29.52%
Return mandated by CML	74.47%
Less return mandated by SML	44.95%
4. Net selectivity	- 3,87%

Total Actual Return	70.60%
	=====

The Jensen measure can be recovered from this break-up by adding together the last two elements (viz., the net selectivity and the compensation for inadequate diversification) to give $29.52 - 3.87 = 25.65\%$.

From evaluation to Correction.

As we noted in the very beginning of this chapter, one important reason for doing performance evaluation is to help us in correcting our errors and improving our performance over a period of time. (If we are evaluating somebody else and not ourselves, this is not relevant; the corrective action may simply consist of replacing the portfolio manager). How do the performance evaluation measures discussed so far provide us with a basis for such an exercise of self improvement?

The Fama framework provides a very convenient tool for this purpose. A simple comparison of the return on P's portfolio (70.60%) with that of the market (41.40%) would indicate that P has significantly outperformed the market. Fama's measure of net selectivity indicates that, on the contrary, the return was 3.87% less than what it should have been. The Fama analysis indicates what has gone wrong. The first two components of the Fama decomposition specified above tell us what the position was in terms of systematic risk. The beta of P (1.121) was a little higher than that of the market (1.00)

warranting a return of $12.00 + 32.95 = 44.95\%$ marginally higher than the market's 41.40. but the actual return earned by P of 70.60 is far higher than this. The real problem is in the third component – the compensation required for P's poor diversification is a whopping 29.52%; this is what turns the tables on P making his performance somewhat mediocre. The portfolio manager should now know what to do with such a portfolio: the unsystematic risk of the portfolio needs to be brought down. Throughout this book, particularly in the chapter on portfolio design, we have talked of the dangers of seeking excess returns at the cost of diversification and the steps required to avoid it. The Fama decomposition pinpoints the source of the problem and now it is up to Mr. P to correct it.

In other cases, the Fama decomposition may indicate that the problem is one of excessive beta. The portfolio manager would then have to examine whether he has been allowing his beta to exceed the target value decided by him on the basis of his attitude towards risk.

In yet other cases, the analysis may show that the problem is not due to risk but to the return itself being inadequate. Further investigation may reveal that the poor return may have been caused by high operating costs. For example, the portfolio may have been turned around too often leading to very high brokerage and other transaction costs. This may indicate the need for a less active portfolio management strategy. Alternatively, the return may have been low because of poor stock selection. This may mean that the portfolio manager needs to revise his knowledge of fundamental and technical analysis, firm and industry analysis, etc.

In short, with performance evaluation, the wheel has turned a full circle and we are back to the essentials of portfolio management with which we started this book. As we approach the end of this book at this point, we would like to remind our readers that the wheel never stops. The path to superior performance lies in a continual refinement of skills with regular evaluation of performance to tell us how far we have come and how far we need to go.

LEARNING UNIT - V

PORTFOLIO MANAGEMENT

[Reading Material]

**Administrative Training Institute
Lalithamahal Road, Mysore - 570 011**

Learning Unit - 5

Reading Material

Introduction :

To a common man, there is little difference between investing in shares and gambling. This is true to some extent, because of the difficulties in predicting future trends in the stock market. Many take risk by investing in shares based on analysis and reasoning.

The present situation in India is that individual investors have to compete with professional and organized investors like bank sponsored mutual funds. In order to enable them to take rational decisions, it is absolutely necessary for them to understand Portfolio Management.

The main focus of analysis of Portfolio Management will be on 'forecasting security prices'. For this purpose it is necessary to understand the functioning of stock exchanges in India.

In Learning Unit 2 we have discussed the use of Discounted Cash Flow Technique (DCFT). DCFT is used to calculate the present value of future returns on share.

A technical analyst or a chartist may analyze stock prices based on the psychological factors i.e., on mood of the crowd rather than on the reputation, earnings per share ratio, dividends etc., this method often called as 'technical analysis'

Most investors invest in several securities rather than on a single security. This kind of diversification of investments reduces the variability of returns. This is the basis of 'Modern Portfolio Theory'.

Bonds or debentures have a definite income when compared to shares. The only threat for this definite income is change in the interest rate or default in payment of principal or interest or both.

The income return will be calculated in terms of present value.

Convertible debentures are a mix of the characteristics of a share and a debenture. In India, this is more popular as a financial resource.

For any given single security, one should estimate the return as well as the risk. But in portfolio management the situation are as follows:-

- One must have sufficient funds
- Estimate, out of the available funds, how much the investor should invest in each category of assets, such as equity, bonds and money market instruments. This is nothing but asset allocation.

- Select securities under each category of asset.
- Estimate risk that the investor is willing to take under each category of asset.
- Specify the time period to be considered to evaluate the performance of the portfolio.
- Design the portfolio.
- Make revision based on the changes in the prices of securities.
- Make revision based on interest and other such parameters.
- Consider the influence of changes in industry and in the economy as a whole.

When profits are received on securities taxes have to be paid as per the existing laws.

After designing a portfolio, the market movements must be analyzed. The risk estimated, must be commensurate with the movement of the market.

Time Value of Money

In Learning Unit 2 we have learnt the calculation of time value of money i.e., to calculate the present value of returns receivable in future. Normally time value of money is measured on the basis of interest.

As discussed in Learning Unit 2 the future value of money invested will be calculated by using compound interest formula.

$$FV = PV \times (1+r)^n$$

Where FV stands for future value and PV stands for present value and 'r' stands for interest rate and 'n' stands for number of years.

For example, the FV of Rs.100 at the interest rate of 10% at the end of the first year is equal to Rs.110 and at the end of second year the FV is 121 and so on.

In Learning Unit 2 we have also learnt the use of SPPWF and USPWF tables, where the calculations were made for Rs.1 for different years and at different interest rate to find out the present value.

Now reverse the question i.e., how much should we invest now to get Rs.121 at 10% at the end of the second year. The answer is that we have to invest Rs.100 now. That means the PV of Rs.121 receivable in future is Rs.100. This is called the process of discounting. Here the interest rate used is called discounting factor.

To get the present value, we have to reverse the compound interest formula, which is as follows:

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

In Learning Unit 2 we have also learnt the calculation of internal rate of returns.

In this learning unit, group activities will be given for participants to acquire further skills in calculating PV of returns.

Perpetuity

The cash flow at constant level at fixed periodic intervals without a time limit is called perpetuity. For example, to get constant returns of Rs.1000 per year at interest rate of 10% one has to make one time deposit of Rs.10,000.

Annuity

Annuity is a series of constant cash flows for a fixed time span. For example, constant repayment in case of housing loan.

Stock Exchange

Stock Exchange is a place where securities are bought and sold. Therefore, it is also called capital market. To raise money in the market the entrepreneurs may float the shares, debentures or bonds in large number of small units. Any person may buy or sell such securities in the stock exchange.

Earlier, brokers formed associations to facilitate the buying and selling of securities. Through these associations they are undertaking their own activities, or on behalf of others on a commission basis. Gradually, these associations grew into corporate agencies.

In India, we have 19 stock exchanges out of which the Bombay Stock Exchange is the largest accounting unit for 80% of transactions in India.

The stock exchange consists of nominated members by Government of India and the elected members among the member brokers. The President and the Executive Director are responsible to see that the activities at stock exchange are carried out in accordance with the rules and regulations issued by Government.

SEBI has been formed to ensure that stock exchanges function in an orderly manner. Every company wishing to raise capital shall list their securities on at least one of the stock exchanges in the country.

The primary market deals with the issue of new securities. The secondary market deals with old/existing securities. On maturity, bonds or debentures can be redeemed in the primary market. Or, before maturity bonds or debentures can be sold in the secondary market. But the shares can be sold only in the secondary market.

New securities can only be purchased in the primary market, by using application form with application money. In case of over subscription of shares, allotment will be made on seniority or by lottery.

Market Order

An investor may place his transactions with a broker without specifying the price. Such order of placing transaction without specifying the price is called market order. It is the responsibility of the broker to protect the interest of the investor.

An investor may specify the minimum price level in case of selling or specify the maximum price in case of purchasing securities. This is called limit order. If the investor specifies that the broker must make the transaction at the day's opening price, it is called open order.

After the transaction is over, the broker will intimate the details to his client.

Lots

In Stock Exchanges the trading of securities must take place in a smooth manner. Therefore, each company must prescribe limits in terms of the number and variety of securities, amount and duration. Often this is called 'market lot'. Other than market lot, sessions will be held for trading securities, known as 'odd lot'. Normally, it is more beneficial for an investor to participate in a 'market lot' session, rather than in an 'odd lot' session.

Ring

Collective Assessments are made in Stock Exchanges at fixed hours. Brokers make investments on behalf of the investors or the investors themselves make the investments. If there is healthy competition, there will be a perfect market to determine the price level of different shares.

Trading in shares

Shares are of two categories

- ? Specified and
- ? Cash

The shares which are activity traded will be listed under the specified list. Securities like, preference shares, debentures and convertible debentures are listed under the cash category.

Settlements

The dates for settlement of shares will be fixed by the Stock Exchange. On the first date, all the outstanding transactions will be settled. Thereafter, securities will be traded for cash. Alternatively, both the seller and the buyer may agree to defer the settlement of transactions to the next settlement date. Normally this is known as settlement trading.

The other kind of settlement, also prevailing in our system, is called 'short-time settlement', where transactions have to be settled within 48 hours.

Buying a Share

One will purchase a share at the existing market price, expecting that its price will rise in the future. If however, one does not have enough cash to purchase these shares, one may purchase the shares under the 'settlement system', described below.

What is a settlement System?

The price of a share has two levels.

- The price as it exists on the settlement date, also known as settlement price. (the price at the last hour to be considered)
- Purchase price

There may be two possibilities on the settlement day, namely, (i) the settlement price is higher than the purchase price, (ii) the settlement price is lower than the purchase price.

In the first case both the buyer and the seller may forward the transactions. The seller accommodates the buyer to the extent of the difference between the settlement price and the purchase price, and also provides time to make cash payment. The buyer must compensate the seller in terms of interest. This is known as Contango or Forwardation charge.

In the second situation, the purchase price is higher than the settlement price. In this case, the buyer will pay the difference. The transactions price will be based on the settlement price. The buyer shall pay the Forwardation charges.

Bulls & Bears

An investor who expects the price of a particular security to rise, and purchases a large amount of shares on that expectation, is called a Bull. The opposite is Bear.

Selling

If a share holder anticipates a fall in the price of a share, he would like to sell before the price drops. He may even sell a share which he does not have. This may be done under the "Settlement System". When the settlement price is lower than the selling price, the buyer has to pay the difference and the Forwardation charges. If the settlement price is more than selling price, the difference will be paid by the seller and the seller receives the Forwardation charges.

Backwardation Charge

So far we have noticed that, the Forwardation charge shall be paid by the buyer to the seller. The other kind of situation may be possible, where the seller has to pay to the buyer. This is called backwardation charge. When the buyer has got sufficient cash to purchase shares, but the seller not in a position to deliver the Share Certificate, then the seller has to pay backwardation charge on the settlement date, towards postponing the delivery of Share Certificates.

Faceless

If shares sales and purchases are done through brokers, the sellers and purchasers may not come into contact with each other on the settlement date, and the transaction is stated to be 'faceless'.

Book Closure date

While purchasing securities in the secondary market, one must also get a transfer deed duly signed by the seller. The details of transfer of share must be sent to the company, before it closes the records on the book closure date. Then only, the holder of securities becomes eligible for the benefits announced by the company. To prevent possible problems, a company will announce the closure date, well in advance.

Good deliveries

To consider a security as good delivery, it must have the following details:

- It must be accompanied by a transfer deed
- Certified by the company or by the stock exchange
- Full name and address of the transferee
- Distinctive printed number
- Date of certification
- Payment of stamp duty
- Payment of transfer fees
- Legible and not spoiled

In the absence of the above details it is considered a bad delivery.

When prospective investor applies for shares a company may ask the investor to pay some part, say 50%, upfront, and the remaining in suitable installments. When the company calls for payment within the stipulated date, it must be complied with immediately. Otherwise it will amount to a bad delivery.

Kerb

Unofficial transactions that take place outside or inside the stock exchange, and are not reported to stock exchange are called Kerb Trading. The prices quoted in such Kerb trading are called Kerb price.

Activisation through settlement trading.

In 'settlement trading' one has to pay only towards Forwardation or backwardation charges. Therefore credit transactions in securities can be increased in 'settlement trading' by removing the problems of cash constraint. This means 'Settlement Trading' increases transactions in securities, which will lead to healthy competition and better price. This will activate the Secondary Capital Market, which in turn will facilitate better transactions in Primary Capital Market.

Speculation

The demand and supply theory of economics will work on the movement of the price of the security in the market. The problem of speculation sets in where there are large scale transactions or volatile fluctuations in purchases and sales with reference to a particular security. Especially, 'take over bid' i.e., one who wants to purchase large quantities of a particular share, will cause a steep rise in share price, because the increase in the value of the share will cause others to enter the fray and purchase the same share. Sometimes the staff of a company, based on some inside information may resort to heavy buying of shares with a view to manipulating the stock market.

The major stock portion of shares is generally in the hands of financial institutions and the other controlling groups. In some cases this may as high as 80%. The remaining portion of shares may be in the hands of the public. If such financial institutions purchase or sell the shares in large quantities, it will add to fluctuations in the share price and the general public will have no control over it.

Other factors, including the legal compulsion of multiple listing i.e., listing of shares in more than one Stock Exchange, and the sudden flow of excessive money in the share market like mutual funds, NRI funds etc., will also cause a steep rise in share prices.

Curbing of speculation

Default risk is a factor associated with excessive speculation. Stock Exchange authorities may adopt the following measures to reduce the default risk.

1. The stock exchange may impose a 'daily margin' at a prescribed percentage on a particular security. The daily margin amount may vary directly with the speculation. This margin money stands as insurance against default risk. The daily margin' may be imposed on a bull or a bear.
2. To reduce the indiscriminate carrying forward of transactions, the stock exchange may impose carry-over margin.
3. The stock exchange may directly control the settlement price, so that there will be reduction in default risk.
4. The carry-forward transactions take place with reference to the shares in the specified list. The stock-exchange may shift a share from specified list to cash list to eliminate carry-forward transactions in that particular share. Since the cash transactions to be taken place within 48 hours, the risk of default will come down
5. The Stock exchange may fix outer limits of price for a share
6. It may levy a ceiling limit on the volume of transactions
7. It may raise the Forwardation and backwardation charges
8. It may impose a time limit to carry forward the transactions
9. The very trading in a security may also be suspended, either on a temporary or permanent basis.

Value Based Investing

The Shareholder expects benefits in the form of dividends. The quantum of dividend depends on the performance of a firm. The performance of a firm will be influenced by various economic factors. Therefore to take a decision to invest in shares, one has to evaluate the performance of a firm with reference to various economic factors.

If we use the concept of Time Value of Money by applying the Discounted Cash Flow Technique, the Present Value of the expected returns must be more than Present Value of the investment.

The problem is that dividends do not remain constant from period to period. The dividend per share (DPS) varies directly with the income of the firm.

A relative analysis has to be made between the earnings per share (P/E) and the market price of share. The earnings per share to be taken into account is based on average payment of dividend for the past fixed period. It should be compared with the current growth rate in dividend per share. This should also be compared with the existing market

price of the share. The average of the past fixed period of earning per share shall not be below the current earnings dividend per share. Again, there must be a higher gap between the market price of a share and the current earnings of dividend per share. Any analysis based on perfect stock exchange market may not be realistic. This is because perfect stock exchange is based on the assumptions that information is perfect and timely, that customers are rational, and that there are no manipulations, etc.

Assessing the future profitability of a firm is one of key factors to estimate the expected return to shareholder.

The investor is advised to always look into the historical data of the company under selected indicators. He should collect and analyze the market trends of shares, and list out the strengths and weakness of the company. He should concentrate on and analyze the circumstances under which movement of price have taken place. He should try to anticipate situations that may repeat in the future. He should identify the impact of changed policies at different levels, as well as the realities of competition and the effect of changing technologies on the company's performance. In short the investor must examine the company's activities from all sides by considering all factors.

Bonus Issue

A firm may provide a 'bonus issue' by transferring surplus reserves (retained profits) to share capital by book adjustment. Such a 'bonus issue' will cause a rise in the number of shares and reduction in Dividend Per Share.

One of the major reasons for issuing 'bonus issue' is to reduce the extremely hiked market price of a Share and to enable the people to purchase shares and thereby enlarge the share capital base.

Rights Issues

Whenever fresh shares are issued, the existing shareholders have a right to subscribe to new shares in proportion to their existing share holdings. Convertible debenture holders also have a similar right. Such rights of existing holders are known as 'rights issue'.

Cum-Rights Price

The 'cum-rights price' means the price of the security before the 'right-issue' is known.

Ex-rights price:

The 'ex-rights price' means the price after the 'rights issue'.

Market Value of a right

The 'market value' of a right is the difference between the 'cum rights price' and the 'ex-rights price'.

Capital Appreciation

The contribution made by capital appreciation to a share, sometimes, may be more than the contribution of dividends to share.

Economics

The profitability of a firm will be influenced by the following factors.

- a) Growth rate of the economy
- b) Rate of inflation
- c) Foreign exchange rates
- d) Variations in demand and supply
- e) Substitution effect
- f) Changes in industrial policy by the Government
- g) Labor relations
- h) Creditability of brand
- i) Technology
- j) Quality of management etc.

All these factors, apart from influencing the profitability, also influence a firm's shares. Most of these factors will have uncertainties both in the long-run and as well as in the short run. The investors normally focus on the uncertainties of the factors in the short-run. Therefore technical analysts argue that the movement in share prices will be influenced by the psychological factors rather than the economic factors. The technical analyst use a line chart, described below.

Line Chart

A Line Chart is prepared on the following points:-

- Identify the closing price for each period
- Mark this as points on chart
- Join this points by a line

The Dow Theory developed by Prof. Charles Dow depends on averages, which will reflect the following three kinds of trends:

- The primary trend

- The secondary reactions
- The minor trends

Analysis is limited to the primary trend and the secondary reactions.

Following are the 3 moves of the primary trend.

- The trend caused by accumulation of shares by the knowledgeable investors.
- Second trend caused by the reports of good earnings by corporations.
- Third trend caused by the reports of financial well-being of corporations

How speculation works?

If there is a lack of sustainability of the earnings level, one may sell shares. Once this starts, the confirmation of unsustainability will be stronger, and other will join the stream of selling.

Finally there may be a situation of distress selling. For all this movement, either upward or downward, the average will be the base. If the averages on the bullish trend are stronger, there may be a up-trend. If on the other hand, the averages on the bearish side are stronger, there may be a down-trend. The beginning signal followed by confirmation will decide the direction of trend.

Indicators :

It is very difficult to guess the behavior of the market in the long run. To some extent one can expect what may happen in the short-run or in the near future based on the volume of transactions read with the price.

- A. The first possibility is rising price with rising transactions
- B. Falling prices with rising transactions.
- C. Rising price with falling transactions.
- D. Falling prices and entry of new securities

The price of the securities may always move between the support level and the resistance level. The highest value and the lowest value will be resistance and support level.

Buying may increase when price moves towards the support level and selling may increase when the price move towards the resistance level. Sometimes over a period newer levels may also possible.

The difference between the closing price of a share of a previous day and the opening price of a share of a current day is called gap. The greater the gap with higher opening price, the higher the willingness to pay. A lower opening price or a minus opening price shows higher willingness to sell.

Whatever may be outcomes of the theoretical calculations the fate of a share depends on the responsiveness as a unique indicator. This is because most of the theoretical calculations have their own limitations. The major limitation is that outcomes of the theoretical calculations may be true in short run but not in the long run. Even in the short run, actual may vary from the expectations at higher proportions. The assumption of market efficiency based on perfectness by the Technical Analysis is highly unrealistic.

Modern Portfolio Theory (MPT)

MPT is based on the behavior of the investor. The investor may make decision based on the expected return and the riskiness of returns. The higher the level of fluctuations, the higher is the risk.

Therefore an investor may not prefer a share having higher level of fluctuations price. He may prefer a share even with a lower return, if the risk is low.

To reduce the risk, an investor may invest in different securities. Loss, if any, in one security will be offset by gain in another.

Portfolio means holding number of securities at a time by an investor. MPT is based upon its analysis on risk and return. When two varieties of securities have got equal risk, an investor may decide in favor of a security which is expected to yield higher return. If such two varieties of securities are expected to yield equal return, an investor may prefer a security having lesser risk.

Now, to reduce risk, one may invest in more than one security, but one must also limit the diversification. This is because; again risk may be higher when the diversification is very high.

One may also think of holding all variety of securities. Such holdings will be called as market portfolio. The market portfolio is associated with the market risk. This market risk cannot be eliminated through diversification. Overall changes in the market price will have its own effect on a given security. The effect may change the degree of riskiness of a security. This is nothing but sensitivity of one security with reference to the changes in riskiness of other securities in the market.

This is known as the beta co-efficient of the security. That means, the return on a security depends on the risk measured by this beta.

The risk of investment in each security in terms of variations may be calculated in terms of percentage and then one security may be compared with the other. Such comparison may help the investor to decide how much he has to invest and in which security.

The expected return on each security may be arrived by means of weighted average.

The comparison of estimation of risk and return of each security will place an investor in a better position to decide the purchase of each quantum of security, or not to make a purchase etc. The important point is that in spite of all such efforts regarding diversified investment one cannot reduce the risk to zero. The reality is that one has to accept the margin of market risk or non-diversifiable risk. The selected number of securities from the different industries is sufficient to analyze a market portfolio.

The non-diversifiable risk or market risk may involve with risk associated with the fluctuations in the market index itself. The diversification will not eliminate the market risk.

We know that risks are of two types, (i) Diversifiable risk, and (ii) Non-diversifiable risk

Diversification of investments within an industry and diversification across several industries are of two different types. But the focus will be on the same i.e., reduction of risk.

The non-diversifiable risk is also called as unavoidable risk and such risks cannot be diversified, because the entire market will be affected by one factor for e.g., common fiscal policy.

CAP-M (Capital Asset Pricing Model)

We know that an investor always tries to choose a security with low risk and high return. Before investment, the decision to invest is based only on estimations. To reduce risks, one will invest in securities of different firms in a industry or industries. The combination of securities that one would like to purchase will be influenced by the dominance principle. This has to be worked in various proportions of risk and returns on securities. Based on this, an 'opportunity site' has to be formed by incorporating all the select securities in a portfolio. The Opportunity site has two layers, upper layer and a lower layer. The securities showing the combination return and risk below a lower layer of opportunity site will not be considered by an investor. The best choice to invest in securities depending on the combination of risk and returns lies between the upper

layer and the lower layer which may be called as an 'opportunity zone' of portfolio.

The Zero risk securities, like gilt edged securities, will have fixed income and this will alter the 'opportunity zone' of a portfolio, if combined with the other risk – associated securities.

Capital Market Line

The CML exists between the return and risk of diversified portfolios.

The Market portfolio will take into account all the risky securities. The CML is a straight line (linear), showing the direct relationship between the risk and the expected returns. The investors would have their portfolios on the CML, but within the opportunity zone i.e. up to upper layer.

One expects reward for risk and compensation for the waiting period. The MPT is based on the assumption that once the securities are correctly priced, the relationship between the return and the risk of individual securities are clearer.

The reward for the risk is the risk premium. The return is directly proportionate to the risk. This is a linear assumption in MPT. This simple relationship between risk and return in linear form is known as the Capital Asset Pricing Model.

The Security Market Line (SML) clearly indicates that, an investor expects higher returns for higher risk. The SML risk factor is of undiversifiable market related risk. It is valid for all portfolios and for individual's securities.

One can plan to eliminate risk or reduce risk by diversifying the investments in securities by a lot of calculations. But a real risk may arise, because of market wide movements of security prices. The MPT is based upon an important assumption that riskiness of a security is vulnerable to market risk. Therefore, a sensitivity analysis must be done i.e., return of the security with reference to the market return. The sensitivity measurement is denoted by the Greek letter beta (β). The increase or decrease in the market returns will be calculated in terms of percentage and its effect on security return will be multiplied by beta with reference to the percentage change in the market return. A zero beta indicates risk-free securities. The riskiness of a security and the value of beta vary directly. The beta measures the non-diversifiable risk. A security will be called as an aggressive security if its beta value is > 1 and it will be called as defensive security, if its beta value is < 1 .

To determine the beta of a portfolio, go through the following steps

- 1) Get the beta of each security
- 2) Workout the investment on each security in terms of percentage

- 3) Multiply the beta of each security with the decimals (of percentage of investment of a security)
- 4) Add the result on each security as obtained in step-3. the total will be the beta of the portfolio.

The financial experts will do the beta analysis. As individuals we may find it difficult to do the beta analysis i.e., the effect on one variable (return on a security) because change in other variable (market return). The financial experts, depending on the price situations, calculate the beta estimation on daily, weekly or monthly returns. They may use shorter periods or longer periods to estimate the beta. They will give the reason for using the specific length of period. While doing beta estimations, the exceptional price movements need to be ignored.

Design

The investment portion may contain many asset classes, such as, equities, bonds, bullion. PSU bonds, cash and money market instruments. Portfolio may contain cash also and sometimes they may contain high liquid securities to enable the portfolio manager to have flexibility in the transactions regarding buying and selling of scrips. This will enable him get over the problem of balancing sales to purchases on day-to-day basis.

Some of the portfolio holders may hold a higher portion of bonds when compared to shares from the point of view of stable source of income and when compared to variations in the fortunes on shares.

The analysis which has been dealt so far will help us decide the allocation of funds to invest in equities, bonds and money market instruments. The investment in equities will depend on risk and return and on the beta factor. The risk on bond depends on changes in interest rate. Such risk will be measured by duration. The default risk is also associated with in case of individual bonds. However, since the beta sensitivity of bonds and money market securities is extremely less, its risk factor in portfolio may ignore. Now the focus in portfolio will only be on the equity. Therefore, the beta of every share, if added, will be equal to the beta of total portfolio.

The shareholders are the real owners of the company. In case the company is to be wound up, the share holders will be the last persons to get the money, if any. Therefore, share equity is longest source and duration asset in the capital market. The change in the interest rate may also affect the share price through PE ratio. It may alter the portfolio structure more in favor of bonds when compared to the equity scrips.

Fluctuations in the stock market index show how the value of each portfolio will behave, if such portfolio had a beta of one. Based on this an investor may choose a beta below one or very near to one, but below one or equal to one or to be aggressive investor i.e., by taking more risk, beta more than one. The stock market index will normally be, for 10 years. The return and risk varies directly. The baseline of zero risk security will be taken

as base and return above such zero risk security will be taken as base to expect returns on the risk oriented securities. This will decide the desired level of beta.

The risk in bond is that of change in interest. If one holds bond upto its duration, the interest rate risk will be equal to zero. The investor needs cash at different points of time. This will influence duration of the holding period. Therefore in portfolio management an investor needs to list out the cash needs at various points of time. This will have effect on the cash inflows and cash outflows, sales and purchases of securities in a *port folio*. An investor expects higher returns for larger duration.

Now we know that the duration and beta has got its effect on holding of different kinds of assets and with what duration in a portfolio. It must also be noted that not only the proportion of each class of assets will be get affected, but also composition of the portfolios within each asset class will also be get affected.

The expected rate of return on the total portfolio will be influenced by the asset allocation i.e., bonds, equity and money market instruments. Once we decide to take the risk, the level of risk in the form of beta is the target beta. Beta is a vulnerability of return on security with reference to changes in market returns.

Even after the determination of a target beta with duration, changes in market values with higher velocity may alter the weights and averages of a security/s which may necessities a rebalancing of portfolio.

An investor must necessarily be ready against the slump or boom in the market values. Anticipating in advance, that is the market movements and exploiting it in the short run, is a skill rather than luck. To make quick realignments in beta and duration, diversification shall be made to such an extent in a portfolio, preferably with adjustable liquidity. We must keep out portfolio beta in and around the target value to make quick adjustments, so that we can adopt defensive or an offensive portfolio. Defensive implies protection against slump. Offensive implies taking advantage of a rising market. To switch over this way or that way, an investor must have a clear plan - whether to sell or purchase, how much, in what duration, in which class etc. A pre-determined plan with lot of options will enable an investor to run an investment in proper gear. This is often called as tactical asset allocation.

Portfolio design depends upon the following points:

- Selection of industries
- Selection of firms in an industry
- Selection of Assets Class
- Selection of security under each of Asset Class
- Estimation of return and risk on each security

- Calculation of vulnerability of return on a security to changes in market returns i.e., calculation of beta.
- Determination of target beta
- Determination of duration of each kind of security
- Realignment based on the strategy of offensive or defensive portfolios.

Mutual funds is the other source for an investor i.e., investing in mutual funds and allow the mutual fund operator to do the portfolio management for him.

In portfolio design each asset component, has to be designed properly. In each asset component, the level of each specific security has to be determined with reference to market risk and interest rate risk. Once the level has been determined with duration continuous rebalancing is required in response to forecasted market trends.

This is all about designing and revision of portfolios

Constant ratio plan

Constant ratio plan means maintenance of the ratio on common percentages with reference to asset allocation in a portfolio with some percentage of a band for fluctuations. The extent of the trading depends on the width of a band.

Constant Value Plan

It means constant value be invested with a prescribed band.

Insurance

An investor may opt for portfolio insurance as protection against downward movement in prices. Just as an investor can buy 'put options', the investor can sell a security at a pre-specified price with pre-specified date. In case of downward trend, an investor may sell accordingly with no or little loss. By this option, one cannot compel an investor to sell when the prices are up. That means when prices are going up an investor may make profit without any obligation.

One cannot have all the kinds of securities in a single portfolio. An investor may select only a few securities for diversification in a portfolio. Only a regular financial institution may choose large number securities for portfolio design.

Evaluation

Did everything happen according to our expectations? If not, what were reasons for the differences between the actual and the estimations. Why did our estimation go wrong?

Why could we have not foreseen the changes? What analysis was made by us and others?

Answers have to be searched for above key questions in the process of evaluation of portfolio performance. For this purpose every transaction has to be evaluated to ascertain whether the decision regarding the purchase, sale, timing, duration, amount and return, was profitable or not. To assess the necessity to continue a security in a portfolio, evaluation is required. Finally portfolio as a whole has to be evaluated. The most important point is that the evaluation must be timely. An appropriate period for the portfolio evaluation must be determined. Otherwise the evaluation report is likely to be misleading.

The evaluation report shall be used for corrections and refinement of portfolio structure.

(Acknowledgements to Professors S.K.Barua, V.Raghunathan and J.R.Varma for their Book on Portfolio Management)

LEARNING UNIT - V

PORTFOLIO MANAGEMENT

[Instructions to Faculty]

**Administrative Training Institute
Lalithamahar Road, Mysore - 570 011**

Portfolio Management

General Instructions:

The faculty must give a detailed presentation on the topic for conceptual clarity. Faculty may use visual aids Nos. 32-40 as given in this handout.

Presentation on Portfolio Management:

Make an initial presentation with focus on the following objectives: namely that the module will enable the participants to:

1. Discuss, understand and interpret basic principles required for designing, analyzing and managing a portfolio.
2. Forecast future share price movements.
3. Identify factors that influence financial performance of companies.
4. Discuss the proportion of total funds that should be invested in each security.
5. Discuss the design of a portfolio for decisions on asset allocation and choice of securities within each broad category of assets.
6. Understand the need for revision of portfolio based on the changes in the prices of securities.
7. Evaluate performance of a portfolio.

The opening presentation, outlining the objectives of the module will be followed by a more detailed presentation covering the following points.

- Types of stock market orders: market lots and odd lots, and the trade ring
- Trading in the stock exchanges; settlement trading in specified shares
- Share purchase on settlement basis or taking a long position
- Backwardation/ Forwardation charge
- Faceless transactions
- Book closure and record dates
- Good and bad deliveries
- Kerb trading
- Settlement trading
- Speculation detection in the market and curbing of speculation.
- Ratio analysis of balance sheets
- Financial analysis and measures of risk with examples.
- Technical Analysis and Charting.
- Asset class: (i) Equities, (ii) Bonds, (iii) Cash and money market instruments

- Strategic and tactical asset allocation
- Overall portfolio beta and duration
- Portfolio design, achieving target beta and duration with problems and solutions.
- Portfolio design target return approach.
- Portfolio revision, problem and solution.
- Portfolio insurance.
- Evaluation of Portfolio performance.

Visual aids

The visual aids Nos. 32 - 40 given below will help the faculty make a presentation on portfolio management.

Visual aid 32 - Portfolio Management

<p style="text-align: center;">Portfolio Management The basics</p> <ul style="list-style-type: none"> • Meaning • Basic principles • Designing • Price movements • Financial performance • Decision on investment quantum • Asset allocation • Evaluation of portfolio performance
--

This visual aid will enable the faculty to introduce the subject of Portfolio management. Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 33 - Coverage

<p style="text-align: center;">Coverage</p> <ul style="list-style-type: none"> • Stock exchange • Value based investing • Economy, Industry and Firm • Technical Analysis and Charting • Capital Asset Pricing • Portfolio Design
--

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 34 - Stock Exchange

Stock Exchanges

- Characteristics of Stock Exchanges in India
- Primary and Secondary Capital Markets
- Trading Ring
- Settlement Trading
- Backwardation and forwardation charges
- Faceless transactions
- Book closure and Record dates
- Good and Bad Deliveries
- Kerb trading
- Detecting speculation
- Large price fluctuations
- Curbing of Speculating

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 35 - Value based investing

Value based investing

- Dividend Model
- Trading positions and market efficiency
- Estimates of return
- PE computation
- Sensitivity analysis

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 36 - Economics

Economics

- Economic analysis
- Industry analysis
- Firm specific analysis
- Inflation
- Interest rate.

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 37 - Charting and Technical Analysis

Charting and Technical analysis

- Types of charts:
- Dow Theory
- Interpreting price patterns
- Decisions using data analysis
- Pitfalls in the interpretation of charts.

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 38 - Risks & Returns

Risks and Returns

- Diversifiable and non-diversifiable risks
- Gains from diversification
- Trade off between Risk and Return
- CAP-M
- CML and SML

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 39 - Asset Allocation

Asset Allocation

- Asset Classes
- Beta and Duration
- Target Return Approach
- Tactical and Strategic Asset Allocation
- Market Timing
- Portfolio Selection.

Faculty may refer to the information given in the Reading Material for Learning Unit 5.

Visual aid 40 - Portfolio Evaluation

Portfolio Evaluation

- Time Horizon
- Risk and Return
- Reward per unit of Risk
- Excess Returns
- Correction

A comprehensive presentation on Portfolio Management, followed by discussion, covering the above points will take approximately two hours.

After this presentation faculty may break participants into four groups.

Participants will be involved in group activities outlined in the handout entitled “Group activity” for Learning Unit - 5.

The four groups will conduct the following:

- Group A: Firm Specific Analysis as per the case relating to Shatabdi Industries
- Group B: Modern Portfolio Theory as per article entitled 'Modern Portfolio Theory'
- Group C: Asset Allocation & Portfolio Design as per article entitled 'Asset allocation and Portfolio Design'
- Group D: Evaluation of Portfolio Performance as per article entitled 'Evaluation of Portfolio Performance'

Group presentations must focus on the examples and solutions given in the articles referred to.

While the group presentations are in progress faculty should encourage participants to note down learning points, which should be consolidated/ summed up in the plenary.

DERIVATIVES

[Group Activities]

Administrative Training Institute
Lalithamahar Road, Mysore - 570 011

Learning Unit - 6

Group Activities

Derivatives

General Instructions:

Participants will work in four groups.

Each group will be required to read the material circulated as well as refer to relevant material obtained library.

At the outset Faculty will make a presentation on this subject; the presentation followed by discussion is likely to take 30 - 45 minutes.

In the section that follows, there is a brief note on the key concepts relating to Derivatives. The note is followed by 10 questions, which participants should attempt to answer after they have been discussed in the groups. The objective of this exercise is to enable the participants to gain a basic understanding of the concept of Derivatives.

The material circulated also includes two short case studies. Each group will be required to study and discuss the cases, and seek solutions to the issues/questions listed there-under.

Sufficient time will be made available for the group activities. At the end of the discussion, participants will prepare visual aids on the key points. Group representatives will make the presentation.

Each presentation will be followed by plenary discussion, which will be moderated by the faculty. The presentations will be followed by consolidation of learning points.

Faculty will be available to assist participants during their group discussion, in case of any doubts or problems.

Derivatives: Key concepts

(Source : Principles of Corporate finance by Professor Brealey.I.Myrer)

The key concepts relating to derivative securities and corporate risk management are listed below:

- There are six reasons risk management might increase the value of a firm. Risk management allows corporations (i) to increase their use of debt, (ii) to maintain their capital budget over time, (iii) to avoid costs associated with financial distress, (iv) to utilize their comparative advantages in hedging relative to the hedging ability of individual investors, (v) to

reduce both the risks and costs of borrowing by using swaps, and (vi) to reduce the higher taxes that result from fluctuating earnings.

- Derivatives are securities whose values are determined by the market price or interest rate of some other security.
- A hedge is a transaction which lowers risk. A natural hedge is a transaction between two counterparties where both parties' risks are reduced.
- Options are financial instruments that (i) are created by exchanges rather than firms, (ii) are bought and sold primarily by investors, and (iii) are of importance to both investors and financial managers.
- The two primary types of options are (i) call options, which give the holder the right to purchase a specified asset at a given price (the exercise, or strike, price) for a given period of time, and (ii) put options, which give the holder the right to sell an asset at given price for a given period of time.
- A call option's exercise value is defined as the current price of the stock less the strike price.
- The Black-Scholes option Pricing Model (OPM) can be used to estimate the value of a call option.
- A futures contract is a standardized contract that is traded on an exchange and is "marked to market" daily, but where physical delivery of the underlying asset usually does not occur
- Under a forward contract, one party agrees to buy a commodity at a specific price and a specific future date and the other party agrees to make the sale. Delivery does occur.
- A structured note is a debt obligation derived from another debt obligation.
- A swap is an exchange of cash payment obligations. Swaps occur because the parties involved prefer someone else's payment stream.
- In general, risk management involves the management of unpredictable events that have adverse consequences for the firm.
- The three steps in risk management are as follows: (i) identify the risks faced by the company, (ii) measure the potential impacts of these risks, and (iii) decide how each relevant risk should be dealt with.

- In most situations, risk exposure can be dealt with by one or more of the following techniques: (i) transfer the risk to an insurance company, (ii) transfer the function that produces the risk to a third party, (iii) purchase derivative contracts, (iv) reduce the probability of occurrence of an adverse event, (v) reduce the magnitude of the loss associated with an adverse event, and (vi) totally avoid the activity that gives rise to the risk.
- Financial futures markets permit firms to create hedge positions to protect themselves against fluctuating interest rates, stock prices, and exchange rates.
- Commodity futures can be used to hedge against input price increases.
- Long hedges involve buying futures contracts to guard against price increases.
- Short hedges involve selling futures contracts to guard against price declines.
- A perfect hedge occurs when the gain or loss on the hedged transaction exactly off-sets the loss or gain on the unhedged position.

Questions:

1. Explain why finance theory, combined with well-diversified investors and “home-made hedging” might suggest that risk management should not add much value to a company.
2. What is a “natural hedge”? Give some examples of natural hedges.
3. What is an option? A call option? A put option?
4. What are some factors which affect a call option’s value?
5. Describe how a risk-free portfolio can be created using stocks and options. How can such a portfolio be used to help estimate a call option’s value?
6. What is the purpose of the Black-Scholes option Pricing Model? Explain what a “riskless hedge” is and how the riskless hedge concept is used in the Black-Scholes OPM.
7. Describe the effect of a change in each of the following factors on the value of a call option:
 - (i) Stock price.

- (ii) Exercise Price.
- (iii) Option life.
- (iv) Risk free rate.
- (v) Stock price variance, that is, riskiness of stock.

8. Briefly describe the following types of derivative securities:

- (i) Futures and forward contracts.
- (ii) Swaps.
- (iii) Structured notes.
- (iv) Inverse floaters.

9. Define the following terms:

- Pure risks.
- Speculative risks.
- Demand risks.
- Input risks.
- Financial risks.
- Property risks
- Personnel risks
- Environmental risks.
- Liability risks.
- Insurable risks.
- Self-insurance.

Should a firm insure itself against all of the insurable risks it faces? Explain.

10. What is a futures contract?

- ❖ Explain how a company can use the futures market to hedge against rising interest rates.
- ❖ What is a swap? Describe the mechanics of a fixed rate to floating rate swap.
- ❖ Explain how a company can use the futures market to hedge against rising raw materials prices.
- ❖ How should derivatives be used in risk management? What problems can occur?

Read, discuss and answer the questions that follow:

Case Study 1: Tropical Sweets Inc.

Assume that you have just been hired as a financial analyst by Tropical Sweets Inc., a mid-sized California company that specializes in crating exotic candies from tropical fruits such as mangoes, papayas, and dates. The firm's CEO, George Yamaguchi, recently

returned from an Industry Corporate Executive Conference in San Francisco, and one of the sessions he attended was on the pressing need for smaller companies to institute corporate risk management programs. Since at one of Tropical Sweets is familiar with the basics of derivatives and corporate risk management, Yamaguchi has asked you to prepare a brief report that the firm's executives could use to gain at least a cursory understanding of the topics.

To begin, you gathered some outside materials on derivatives and corporate risk management and used these materials to draft a list of pertinent questions that need to be answered. In fact, one possible approach to the paper is to use a question and answer format. Now that the questions have been drafted, you have to develop the answers.

- a. Why might stockholders be indifferent whether or not a firm reduces the volatility of its cash flows?
- b. What are six reasons risk management might increase the value of a corporation?
- c. What is an option? What is the single most important characteristic of an option ?
- d. Options have a unique set of terminology. Define the following terms: (1) Call option (2) Put option (3) Exercise price (4) Striking, or strike, price (5) Option price (6) Expiration date (7) Exercise value (8) Covered option (9) Naked option (10) In-the- money call (11) Out of the money call (12) LEAP
- e. Consider Tropical Sweets call option with a \$ 25 strike price. The following table contains historical values for this option at different stock prices:

Stock price	Call Option Price
\$ 25	\$ 3.00
30	7.50
35	12.00
40	16.50
45	21.00
50	25.50

- (1) Create a table which shows (a) stock price, (b) strike price, (c) exercise value, (d) option price, and (e) the premium of option price over exercise value.
- (2) What happens to the premium of option price over exercise value as the stock price rises? Why?
- f. In 1973, Fischer Black and Myron Scholes developed the Black-Scholes Option Pricing Model (OPM).
 - (1) What assumptions underlie the OPM?
 - (2) Write out the three equations that constitute the model.

(3) What is the value of the following call option according to the OPM?

Stock Price = \$ 27.00
Exercise Price = 25.00
Time to expiration = 6 months
Risk-free rate= 6.0%
Stock return variance= 0.11

g. What impact does each of the following call option parameters have on the value of a call option?

- (1) Current stock price
- (2) Exercise price
- (3) Option's term to maturity
- (4) Risk-free rate
- (5) Variability of the stock price.

h. What is corporate risk management? Why is it important to all firms?

i. Risks that firms face can be categorized in many ways. Define the following types of risk:

- (1) Speculative risks
- (2) Pure risks
- (3) Demand risks
- (4) Input risks
- (5) Financial risks
- (6) Property risks
- (7) Personnel risks
- (8) Environmental risks
- (9) Liability risks
- (10) Insurable risks

j. What are the three steps of corporate risk management?

k. What are some actions that companies can take to minimize or reduce risk exposures?

l. What is financial risk exposure? Describe the following concepts and techniques that can be used to reduce financial risks:

- (1) Derivatives
- (2) Futures markets
- (3) Hedging
- (4) Swaps

m. Describe how commodity futures markets can be used to reduce input price risk.

Read, discuss and answer the questions that follow:

Case Study 2: Procter & Gamble & others

Corporate financial managers are generally thought of as models of caution, paid to manage a company's finances prudently and conservatively,. But recent events at Procter & Gamble, Gibson Greetings, and Metallgesellschaft, a major German company, have shaken that image. Each of these companies incurred huge losses on derivatives transactions which were supposedly undertaken to reduce risk.

A look at how P&G got into trouble with risky derivatives shows how tempting it can be for a company to try to magnify its returns, but how difficult it is to predict the risks involved. P&G profited handsomely with derivatives in the early 1990s. Sensing more opportunity for gain, the P&G treasury staff asked Bankers Trust to create a derivative whose returns would depend on both U.S. and German interest rates. Bankers Trust, perhaps the most aggressive, dealer in exotic securities gave P & G three choices. P & G choose the most aggressive gave the derivative that promised the greatest reward but entailed the greatest risk.

The transaction involved two complex swaps. P&G was allowed to issue floating rate debt at a below- market rates, but, in return, the company had to give Bankers Trust a series of "put option" that gave the bank the right to sell to P&G U.S. Treasury bonds and German government bonds at a fixed price. If interest rates in both countries were constant or fell, there would be no problem for P&G – the bonds would be worth more, on the open market than the fixed price, so Bankers Trust would not require P&G to buy them. But if rates rose, P&G would have to buy bonds at above- market prices.

Rates climbed rapidly after the deal was struck, causing bond prices to plunge, so P&G was saddled with a rising liability to buy bonds at above market prices. Bankers Trust said that it advised P&G to cut its losses by closing out the transactions, but P&G wouldn't budge. When the first losses hit, the P&G folks who se the transaction up probably said, "Oh-oh, we have a problem. But let's wait and see what interest rates do before we tell the boss." By the time P&G bit the bullet and closed out the position, it had a pre-tax loss of \$ 157 million.

P&G contended that it was victimized by Bankers Trust, and it sued, contending that the bank did not disclose all the risks involved in the transactions. Said a P&G spokesperson, "These transactions were intended to be hedges. We use swaps to manage and reduce our borrowing costs, not to make money. The swaps turned out to be speculative transactions that were highly leveraged and clearly did not fit our policy." On the other hand, Bankers Trust claimed that P&G is a sophisticated company and that it knew the rules of the game. The lawsuit was finally settled after more than two years of haggling, with Bankers Trust agreeing to cover about 80 percent of P&G's losses. However, derivatives use and abuse has continued to be one of the hottest topics in the financial press.

Discuss and answer

- ❖ Why should companies try to manage risk?
- ❖ What financial techniques can be used to manage risk?
- ❖ What safeguards should companies put in place to prevent programs designed to limit risks from actually increasing them?

DERIVATIVES

[Reading Materials]

Administrative Training Institute
Lalithamahar Road, Mysore - 570 011

Derivatives

Introduction:

Asset/s that derives its/their value from other assets is known as derivatives. For example, an option to buy a share is derived from the share. Derivatives allow more precise pricing of financial risk and aim towards better risk management. It suffers from the threat of misusing to cause, increasing volatility in asset prices. Derivatives will focus on the following: -

- ↗ Forward contract
- ↗ Future
- ↗ Swap
- ↗ Option
- ↗ Over-the-counter
- ↗ Exotics
- ↗ Plain vanilla.

Each of these is described below.

Forward Contract

A forward contract commits the user to buying or selling an asset at a specified price and on a specific date in the future

Future

A Future is a forward contract that is traded on an exchange.

Swap

A swap is a contract by which two parties exchange the cash flow linked to a liability or an asset. For example, two companies, one with a loan on fixed interest rate over ten years and the other with a similar loan on a floating interest rate over the same period may agree to take over each other's obligations, so that the first pays the floating rate and the second the fixed rate.

Option

An option is a contract that gives the buyer 'the right, but not the obligation', to sell or buy a particular asset at a particular price on or before a specified date.

Over- the Counter

An over-the-counter is a derivative that is not traded on an exchange, but is purchased from, say, an investment bank.

Exotics

Exotics are derivatives that are complex or are available in emerging economics

Plain- Vanilla derivatives

Plain vanilla derivatives, in contrast to exotics, are typically exchange-traded, relate to developed economies and are comparatively uncomplicated.

Hedging with futures

Taking on one risk to off set another is hedging. The some of the tools required for hedging are futures, forwards, and swaps. With options, they are known as derivative instruments because one value of asset depends on the value of another asset.

Futures contracts

Futures were originally developed for agricultural commodities. For example, a farmer expects to have 100 tons of wheat to sell next September. If he is worried that the price may decline, he can hedge by selling 100 tons of September wheat futures at a price that is set today. Farmer has to make delivery.

On the opposite a miller will buy wheat after the harvest. The miller agrees to take delivery of wheat in the future at a price that is fixed today without option. The farmer has hedged risk by selling wheat futures; this is termed a short hedge. The miller has hedged risk by buying wheat futures; this is known as a long hedge.

The price of wheat for immediate delivery is known as the spot price. When the farmer sells wheat futures, the price that he agrees to take for his wheat may be very different from the spot price. But as the date for delivery approaches, a future contract becomes more and more like a spot contract and the price of the future snuggles up to the spot price.

The farmer may decide to wait until his futures contract matures and then deliver wheat to the buyer. In practice such delivery is very rare, for it is more convenient for the farmer to buy back the wheat futures just before maturity. If he is properly hedged, any loss on his wheat crop will be exactly offset by the profit on his sale and subsequent repurchase of wheat futures.

Commodity and financial futures

Futures contracts are bought and sold on organized futures exchanges. Note that our farmer and miller are not the only business that can hedge risk with commodity futures. The lumber company and the builder can hedge risk with commodity futures. The lumber company and the builder can hedge against changes in lumber prices, the copper producer and the cable manufacturer can hedge against changes in copper prices; the oil producer and the trucker can hedge against changes in gasoline prices, and soon.

For many firms the wide fluctuations in interest rates and exchange rates have become at least as important a source of risk as changes in commodity prices. Financial futures are similar to commodity futures, but instead of placing an order to buy or sell a commodity at a future date, one can place an order to buy or sell a financial asset at a future date. Financial futures have been a remarkably successful innovation. They were invented in 1972; within a few years, trading in financial futures significantly exceeded trading in commodity futures.

The Mechanics of future trading

When you buy or sell a futures contract, the price is fixed today but payment is not made until later. You will, however, be asked to put up margin in the form of either cash or treasury bills to demonstrate that you have the money to honor your side of the bargain. As long as you earn interest on the margined securities, there is no cost to you.

In addition, futures contracts are marked to market. This means that each day any profits or losses on the contract are calculated; you pay the exchange any losses and receive any profits. For example, suppose that our farmer agreed to deliver 100 tons of wheat at Rs.2080 per ton. The next day the price of wheat futures declines to Rs.2075 per ton. The farmer now has a profit on his sale of $100 \times \text{Rs.}500$. The exchanges clearing house, therefore pays this Rs.500 to the farmer. You can think of the farmer as closing out his position every day then opening up a new position. Thus after the first day the farmer has realized a profit of Rs.500 on his trade and now has an obligation to deliver wheat for Rs.2075 a ton. The Rs.5 that the farmer has already been paid plus the Rs.2075 that remains to be paid equals the Rs.2080 selling price at which the farmer originally agreed to deliver wheat.

Of course, our miller is in the opposite position. The fall in the futures price leaves her with a loss of Rs.6 for ton. She must, therefore, pay over this loss to the exchanges clearing house. In effect the miller closes out her initial purchase at an Rs.6 loss and opens a new contract to take delivery at Rs.2075 for ton.

Notice that neither the farmer nor the miller need be concerned about. Whether the other party will honor his or her side of the bargain. The futures exchange guarantees the contract and protects itself by setting up profits and losses each day.

Spot and Futures prices - Financial futures

If you want to buy a security, you have a choice. You can buy it for immediate delivery at the spot price. Alternatively, you can place an order for later delivery; in this case you buy at the futures price. When you buy a financial future, you end up with exactly the same security that you would have if you bought in the spot market. However, there are two differences. First, you don't pay for the security up front, and so you can earn interest on its purchase price. Second, you miss out on any dividend or interest that is paid in the interim.

Spot and futures prices- commodities

The difference between buying commodities today and buying commodity futures is more complicated. First, because payment is again delayed, the buyer of the future earns interest on her money. Second, she does not need to store the commodities and, therefore, saves warehouse costs, wastage, and so on. On the other hand, the futures contract gives no convenience yield, which is the value of being able to get your hands on the real things. The manager of a supermarket can't burn heating oil futures if there's a sudden cold snap, and he can't stock the shelves with orange juice futures if he runs out of inventory at 1 P.M. on a Saturday.

Forward contracts

Each day lot of futures contracts are bought and sold. This liquidity is possible only because futures contracts are standardized and mature on a limited number of dates each year.

Fortunately there is usually more than one way to skin a financial cat. If the terms of futures contracts do not suit your particular needs, you may be able to buy or sell a forward contract. Forward contracts are simply tailor-made futures contracts. The main forward market is in foreign currency.

It is also possible to enter into a forward interest rate contract. For example, suppose that you know that at the end of six months you are going to need a three-month loan. You worry that interest rates will rise over the six-month period. You can lock in the interest rate on that loan by buying a forward rate agreement (FRA) from a bank. For example, the bank might offer to sell you a six-month forward rate agreement on three-month LIBOR (London Inter Bank offered Rate) at 7 percent. If at the end of six months the three month LIBOR rate is greater than 7 percent, the bank will pay you the difference; if three-month LIBOR is less than 7 percent, you pay the bank the difference. The total principal amount of FRAS outstanding is several trillion times.

Homemade forward contracts

Suppose that you borrow £90.91 for one year at 10 percent and lend £90.91 for two years at 12 percent. These interest rates are for loans made today; therefore, they are spot interest rates.

The cash flows on your transactions are as follows:

	Year 0	year 1	year 2
Borrow for 1 year at 10%	+ 90.91	100	
Lend for 2 years at 12 %		- 90.91	
114.04			
Net cash flow	-----	-----	-----
	0	100	+ 114.04

Notice that you do not have any net cash out flow today but you have contracted to pay out money in year 1. The interest rate on this forward commitment is 14.04 percent. To calculate this forward interest rate, we simply worked out the extra return for lending for two years rather than one:

$$\text{Forward interest rate: } \frac{(1 + 2\text{-year spot rate})^2 - 1}{(1 + 1\text{-year spot rate})} = \frac{(1.12)^2 - 1}{1.10} = 14.04\%$$

In our example you manufactured a forward loan by borrowing short term and lending long. But you can also run the process in reverse. If you wish to fix today the rate at which you borrow next year; you borrow long and lend the money until you need it next year.

Swaps:-

Suppose that the possum company wishes to borrow Euro to help finance its European operations. Since possum is better known in the United States, the financial manager believes that the company can obtain more attractive terms on a dollar loan than on a euro loan. Therefore, the company issues £10 million of five year 8 percent notes in the United States. At the same time possum arranges with a bank to swap its future dollar liability for euros. Under this arrangement the bank agrees to pay possum sufficient dollars to service its dollar loan; in exchange possum agrees to make a series of annual payments in euros to the bank. Possum and the bank are referred to as counterparties.

Swaps are not limited to future exchange of currency. The most common form of swap is actually an interest rate swap, in which counterparties swap fixed interest rate loans for floating rate loans. In this case one party promises to make a series of fixed annual payments in return for receiving a series of payments that are linked to the level of short term interest rates. Sometimes swaps are used to convert between floating rate loans that

are tied to different base rates. For example, a firm might wish to swap a series of payments that are linked to the prime rate for a series of payments that are linked to the Treasury bill rate.

Credit Derivatives

In recent years there has been considerable growth in the use of credit derivatives, which protect lenders against the risk that a borrower will default. For example, bank A may be reluctant to refuse a loan to a major customer (customer X) but may be concerned about the total size of its exposure to that customer. Bank A can go ahead with the loan, but use credit derivatives to shuffle off the risk to bank B.

The most common credit derivative is known as a default swap. It works as follows. Bank A promise to pay a fixed sum each year to B as long as company X has not defaulted on its debts. k If X defaults, B makes a large payment to A, but other wise pays nothing. Thus you can think of B as providing A with long term insurance against default in return for an annual insurance premium.

Earlier example of the farmer and miller showed how futures may be used to reduce business risk. However, if you were to copy the farmer and sell wheat futures without an offsetting holding of wheat, you would not be reducing risk; you would be speculating.

Speculators in search of large profits (and prepared to tolerate large losses) are attracted by the leverage that derivatives provide. By this we mean that it is not necessary to lay out much money up front and the profits or losses may be many times the initial outlay. “Speculation” has an ugly ring, but a successful derivatives market needs speculators who are prepared to take on risk and provide more cautions people like our farmer and miller with the protection they need. For example, if an excess of farmers wish to sell wheat futures, the price of futures will be forced down until enough speculators are tempted to buy in the hope of a profit. If there is a surplus of millers wishing to buy wheat futures, the reverse will happen. The price of wheat futures will be forced up until speculators are drawn in to sell. Speculation may be necessary to a thriving derivatives market, but it can get companies into serious trouble.

Most businesses take out insurance against a variety of risks. Insurance companies have considerable expertise in assessing risk and may be able to pool risks by holding a diversified portfolio. Insurance works less well when the insurance policy attracts only the worst risks (adverse selection) or when the insured firm is tempted to skip on maintenance and safety procedures (moral hazard).

Insurance is generally purchased from specialist insurance companies, but sometimes firms issue specialized securities instead.

The idea behind hedging is straightforward. You find two closely related assets. You then buy one and sell the other in proportions that minimize the risk of your net position. If the assets are perfectly correlated, you can make the net position risk free.

The trick is to find the hedge ratio or delta that is the number of units of one asset that is needed to offset changes in the value of the other asset. Sometimes the best solution is to look at how the prices of the two assets have moved together in the past. On other occasions a little theory can help to set up the hedge. For example, the effect of a change in interest rates on an assets value depends on the assets durations. If two assets have the same duration, they will be equally affected by fluctuations in interest rates. Once you have set up the hedge, you can take a long vacation, confident that the firm is well protected. However, some hedges, such as those that match duration's, are dynamic. As time passes and prices change, you need to rebalance your position to maintain the hedge.

Firms use a number of tools to hedge:

1. Futures contracts are advance orders to buy or sell an asset. The price is fixed today, but the final payment does not occur until the delivery date. The futures markets allow firms to place advance orders for dozens of different commodities, securities and currencies.
2. Futures contracts are highly standardized and are traded in huge volumes on the futures exchanges. Instead of buying or selling a standardized futures contract, you may be able to arrange a tailor- made contract with a bank. These tailor made futures contracts are called forward contracts. Firms regularly protect themselves against exchange rate changes by buying or selling forward currency contracts. Forward rate agreements (FRAs) provide protection against interest rate changes.
3. It is also possible to construct homemade forward contracts. For example, if you borrow for two years and at the same time lend for one year, you have effectively taken out a forward loan.
4. In recent years firms have entered into a variety of swap arrangements. For examples a firm may arrange for the bank to make all the future payments on its dollar debt in exchange for paying the bank the cost of servicing a euro loan.

Instead of using derivatives for hedging some companies have decided that speculation is more fun, and this has sometimes got them into serious trouble.

(Source: Book on Corporate Finance – Professor Brealey.I.Myrer)

DERIVATIVES

[Instructions to Faculty]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Derivatives

General Instructions:

Derivatives are a relatively new subject. Faculty should take care to ensure that basic concepts are explained with simple examples.

Faculty may introduce the topic with a presentation on the overall objectives of the module. This presentation may take approximately 45 minutes and may include the objectives given below.

Objectives

At the end of this learning unit, the participants will be able to:

1. Understand reasons for risk management
2. Understand the background of derivatives.
3. Understand option theory.
4. Use complex option pricing model and the Black-Scholes Model.
5. Understand forward contracts, futures and swaps under Hedging.
6. Use derivatives to reduce risks.

Presentation

The introductory presentation outlining the objectives of the module may be followed with a more detailed presentation focusing on the following points:

- Meaning and background of derivatives
- Time between derivatives and risk management.
- Reasons to manage risk.
- Using derivatives to reduce risks
- Option and Introduction to option pricing models: call option, covered options, naked options, put option
- The Black-Scholes option pricing model.
 - A risky derivative swaps.
 - Natural hedges
 - Comparative advantages in hedging; long hedges; short hedges; perfect hedges.
 - Future market, hedging with futures.
 - Non-symmetric hedge.
 - Forward contracts.

- Currency swaps.
- Commodity futures and financial futures.

Faculty may use visual aids Nos. 41 - 46 to explain the objective and the points related to derivatives.

Visual aid 41 - Derivatives

Derivatives

Objectives

- Reasons for risk management
- Background of derivatives
- Option theory
- Black-Scholes model
- Forward contracts
- Hedging and future contracts
- Swaps
- Uses of Derivatives

Faculty may use the information provided in the reading material for Learning Unit 6 in order to introduce the overall objectives of the module.

Visual aid 42 - Risk Management

Risk Management

- Debt capacity
- Maintaining the optional Capital budget over time.
- Financial distress
- Comparative advantage in hedging.
- Borrowing costs
- Tax effects.
- Compensation systems.

Faculty may use the information provided in the reading material for Learning Unit 6 in order to develop the presentation

Visual aid 43 - Options

Options

- Options types and Markets
- Call option
- Covered options
- Naked options
- Out-of-the-money
- In-the-money
- Put option
- Long-term equity anticipation security (LEAPS)

Faculty may use the information provided in the reading material for Learning Unit 6 in order to develop the presentation

Visual aid 44 - Option Pricing models

Option pricing models

- Assumption
- Range of values
- Range of pay offs
- Risk less hedged investment.
- Pricing the call option.

Faculty may use the information provided in the reading material for Learning Unit 6 in order to develop the presentation

Visual aid 45 - Black-Scholes OPM

Black-Scholes option pricing model (OPM)

- Stock price
- Exercise price
- Option life
- Risk-free rate
- Stock price variance

Faculty may use the information provided in the reading material for Learning Unit 6 in order to develop the presentation

Visual aid 46 - Other Derivatives

Other types of Derivatives

- Forward contracts
- Futures contracts
- Swaps
- Structured notes
- Inverse floater

Faculty may use the information provided in the reading material for Learning Unit 6 in order to develop the presentation

Group activities

After the faculty has made the presentation described above and the participants are reasonably clear about the basics concepts, participants may be given the group exercises described in the handout on Group Activities for Learning Unit 6.

Faculty may explain how group activities should be conducted

There is a brief note entitled 'Derivatives - Key Concepts' in the handout on Group Activities. The participants may be asked to read the note and answer the 10 questions that follow the note.

Following this exercise, participants may be asked to read the two case studies given in the Handout on Group Activities. The case studies relate to (i) Tropical Sweets Inc., and (ii) Proter & Gamble & others. After reading the case studies ask participants to reflect on and discuss the issues/ questions following the case studies.

The reading and discussion exercise will be followed by presentations. Each group will identify a representative to make the presentation on behalf of the group.

Faculty should be available for clarifying doubts that may arise during group discussion, moderate the group presentations and encourage participants to note down the key learning points from the presentations, which should be consolidated in the plenary.

(Source: Principles of Corporate Finance by Professor Brealey.I.Myrer)

International Financial Management

[GROUP ACTIVITIES]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Learning Unit - 7

Group Activities

International Financial Management

General Introduction:

International Financial Management is a new subject for many. It is therefore critical that participants are clear about certain fundamental concepts.

The faculty associated with the training programme will make a comprehensive presentation on the key concepts. The presentation and discussion is likely to take approximately two hours.

Participants will also be required to read the reading materials circulated on the subject.

The module on 'International Financial Management' includes 15 problems which are described in the following section. Participants will be divided into four groups in order to address these problems and make presentations thereon. Groups will work on the following problems:

Group A:	Problems Nos. 1-4
Group B:	Problems Nos. 5-8
Group C:	Problems Nos. 9-12
Group D:	Problems Nos. 13-15

This module also draws on two interesting case studies, entitled 'Guns' and 'Helicopters'. All participants will be required to read the case studies in their respective groups and make specific recommendations on the issues that the case studies raise.

As in the case of previous modules, faculty will be available for clarification of doubts while the group discussion is in progress.

During group presentations, faculty will be available for moderation and summing up.

Activity for Group A

Problem 1:

You are required to find the overall balance, showing clearly all the sub-balances from the following data:

- (1) UC Corporation of the USA invests in India Rs.3, 60,000 to modernize its Indian subsidiary.
- (2) A tourist from Egypt buys souvenirs worth Rs.3, 600 to carry with him. He also pays hotel and travel bills of Rs.6, 000 to Delhi Tourist Agency.
- (3) The Indian subsidiary of UC Corporation remits, as usual, Rs.6, 000 as dividends to its parent company in the USA.
- (4) This Indian subsidiary of UC Corporation sells a part of its production in other Asian countries for Rs.1, 20,000.
- (5) The Indian subsidiary borrows a sum of Rs.3, 20,000 (to be paid back in a year's time) from the German money market to resolve its urgent liquidity problem.
- (6) An Indian company buys a machine for Rs.1, 30,000 from Japan and 50 percent payment is made immediately; the remaining amount is to be paid after 2 years.
- (7) An Indian subsidiary of French Company borrows Rs.60, 000 from the Indian public to invest in its modernization programme.

Problem 2:

Convert the following rates into outright rates and indicate their spreads:

	Spot	1-month	3-months	6-months
Rs/\$	38, 6800/15	10/15	15/20	20/30
Rs/\$	53, 2400/20	30/20	40/30	45/32
Rs/DM	22, 8000/25	20/15	30/50	35/55

Work out the Bid Price, Ask Price and Spread Price in Indian rupees with reference to a) Rupee rate of Dollar b) Rupee rate of Pound sterling, c) Rupee rate of Deutschmark..

Problem 3:

Given the following data:

Spot rate: Rs.45.0640 = \$ 1

6-months forward rate: Rs.45.8490 = \$ 1

Annualized interest rate on 6-months rupee: 10%

Annualized interest rate on 6-months dollar: 5%

Work out the arbitrage possibilities.

Problem 4:

If the \$: Yen spot rate is \$ 1 = Yen 130 and interest rates in Tokyo and New York are 4 and 5 percent respectively, what is the expected dollar yen exchange rate one year hence?

Activity for Group B**Problem 5**

The US inflation rate is expected to average about 3 percent annually, while the Indian rate of inflation is expected to average about 8 percent annually. If the current spot rate for the rupee is \$0.0312, what is the expected spot rate in two years?

Problem 6

1. What types of exchange exposures is a multinational enterprise subjected to?
2. What is transaction exposure? How is it calculated?
3. What different methods are used to calculate transaction exposure?
4. An enterprise buys and sells only in the local market. Can it remain indifferent to exchange rate variations of local currency?
5. Explain with suitable examples the technique of bilateral and multilateral netting.
6. What do you know about the technique of 'Leads and Lags'?
7. How can indexation clauses in contracts be used to reduce the exchange risk?
8. What are the advantages of a re-invoicing centre?
9. Write a note on the use of swaps in exchange risk hedging?
10. Discuss what strategy can be used to reduce transaction exposure?

Problem 7

An Indian exporting firm, Nadakari and Bros, would like to cover itself against a likely depreciation of pound sterling. The following data is given:

Receivables of Nadakari and Bros: \$ 400,000

Spot rate: Rs.61.00/--

Payment date: 4 months

4 months interest rate: India: 11 percent per annum

UK: 4 percent per annum

What should the exporter do?

Problem 8

A UK importer has to pay \$ 200,000 in 2 month's time. He fears an appreciation of the dollar. What can he do with the knowledge of the following data?

2-m interest rate: US\$: 3 percent

UK \$: 4 percent

Spot rate: \$ 1.8414/---

Activity for Group C

Problem 9

An Indian subsidiary of a UK multinational has a translation exposure of Rs.20 million. The rates are as follows;

Spot: Rs.52, 000/---

One-year forward: Rs.55, 1100/- \$

A 5 percent depreciation of the rupee is expected. How can the exchange risk be hedged?

Problem 10

Total translation exposure of a company is Rs.one million. This exposure is in French francs. Interest rates are 5 and 8 percent for the franc and the rupee respectively. How is hedging to be done? Spot rate is Rs.4 per FFr. The rupee is likely to depreciate by 3 percent.

Problem 11

A company will receive \$ 2 million in 2 months (June) from now. It will like to place this sum of for 3 months in Euro-dollar market. The rates are likely to go down. The current rate is 1 percent over and above that of LIBOR, which is 8 percent. Euro-dollar 3 months interest future is quoted at 50. What can the company do?

Problem 12

A company is to borrow DM one million in December for 3 months. At the moment (September), the December DM future is being quoted at 90. The market rate of Euro-DM is 7 percent, which is likely to go up in months to come.

What should the company do? Assume that on 15 December, the DM future has fallen to 89 and the Euro-DM rates are 8.1 percent.

Activity for Group D

Problem 13

A company plans to borrow \$ 10 million by issuing a 90 days commercial paper in August. The yield rate of the CP is 10 percent at the moment, i.e., the month of March. Interest rates are anticipated to rise. Since no future contracts are available in CP, the company can resort to T-bill futures. September T-bill futures are being quoted at 90.

Assume that on August 15, the CP yield has risen to 11 percent and Tbill future contract is quoting at 88. What is the company expected to do?

Problem 14

A treasury manager after five months will need to borrow Rs.1, 00,000 for 3 months. The current rates are as follows:

Duration	Borrowing rates (Percent)	Lending rates (Percent)
3-months	8	9
5-months	9	10
8-months	10	11
9-months	11	12

Problem 15

A company will need to buy after 4 months a forward rate agreement (FRA) from a bank to borrow for 3 months. The 4/7 FRA is quoted at 6.5. What will the company do if after 4 months, the rate?

- (a) rises to 8 percent
- (b) falls to 5 percent
- (c) remains at 6.5 percent

Activity for all groups

Case Study No.1 - Guns:

General Braveheart sat pensively at his desk. His subordinate staff at the Directorate of Production and Procurement had noticed that the General had been in this mood ever since the new requirement for purchase of 200 self-propelled light guns was projected to him last week. He had been unable to make up his mind whether to order our own ordinance factories to manufacture this gun or to purchase it from 'Mitra Desh', a long time arms supplier to India.

Suddenly the General's face lit up, and he said "Hasn't Colonel Brightspark recently joined our Directorate after finishing his M.Tech (Management) from IIT, Delhi? Please send for him."

As soon as Colonel Brightspark was seated, the General opened the topic "You know about the requirement of new guns for the Army. I have had some data collected on the costs involved in various options (See Case Study), but I still cannot make up by mind which option to choose. Study the data carefully and come back to me with your recommendations by the end of this week."

The Proposal Regarding Acquisition of Self-propelled Guns for the Indian Army

Requirement

- | | | |
|----|-------------------------|----------|
| 1. | Total quantity required | 200 guns |
| 2. | Delivery time | 4 years |

Proposal Number 1

1. 'Mitra desh' had proposed sale of guns of India. The details are as under:

(a) Costs

- | | |
|--------------------------------------|-------------------|
| (i) Cost per gun at factory premises | \$ 0.6 million |
| (ii) Freight and insurance charges | 5 percent of cost |
| (iii) Training of users | Rs.50 million |

(b) Mode of Payment

- | | |
|------|--|
| (i) | Cost of gun, freight and insurance: to be paid in three equal installments in dollars. The first installment to be paid immediately and thereafter every one year. |
| (ii) | Cost of training: to be paid in rupees after two years. |

© *Additional Information*

- | | | |
|------|------------------|------------|
| (i) | Cost of dollar: | |
| D. | Present rate: | Rs.35/\$ |
| | After one year: | Rs.36/\$ |
| | After two years | Rs.37/\$ |
| (ii) | Cost of capital: | 14 percent |

Proposal Number 2

- The gun can be manufactured in India. The production will be spread over two different plants, one for the barrels and the other for the gun carriage. Presently, there are no facilities for manufacture of barrels, and thus a new plant will have to be installed. For the gun carriage an existing plant can be used. However, this plant is already working at full capacity and is engaged in manufacture of chassis for commercial vehicles for Malaysia. If the proposal production of gun carriages is to take place in the plant, the production of chassis will have to be stopped.
- Some additional information is as given below:

(a) For Barrel Factory

- | | |
|--|----------------|
| (i) Cost of new machinery
(Machine will have a life of 7 years and a capacity to produce 50 barrels per year. The machine will have an insignificant resale value after seven years of operation) | Rs.300 million |
| (ii) Production set-up costs | Rs.50 million |
| (iii) Working capital requirement to manufacture barrels | Rs.100 million |
| (iv) Fixed overheads per year | Rs.200 million |
| (v) Variable costs per gun | Rs.10 million |
| (vi) Cost of project survey already incurred | Rs.30 million |

(b) For Gun Carriage Factory

- | | |
|--|--------------------------------|
| (i) Cost of retooling | Rs.50 million |
| (ii) Capacity | 50 carriages per year |
| (iii) Number of chassis currently produced | 7,000 |
| (iv) Contribution margin | Rs. 20,000 per chassis |
| (v) Existing fixed costs | Rs. 50 million |
| (vi) Variable costs | Rs. 5 million per gun carriage |
| (vii) Additional fixed costs per year | Rs.150 million |
| (viii) Assembling costs | Rs.20 million per gun |
| (ix) Testing and proofing costs | Rs.1 million per gun |

Solution

Analysis of Proposal Number 1 (Imports)

1.	Total cost of guns: 0.6×200	\$ 120 million
2.	Freight and insurance charges (5 percent)	\$ 6 million
3.	Cash outflow	
	(a) Immediate payment	\$ 42 million
	(First installment)	
	(b) After one year	\$ 42 million
	(Second installment)	
	(c) After two years	\$ 42 million
	(Third installment)	
	(d) Cost of training	Rs.50 million

4. Calculation of present value of cash outflows:

<i>Time</i>	<i>Outflow in \$ (Million)</i>	<i>Conversion factor of \$ (in Rs.)</i>	<i>Total outflow (Millions.)</i>	<i>PV factor at 14 percent</i>	<i>Present value (million Rs)</i>
Immediate	42	35	1470	1.000	1470.00
1 year	42	36	1512	0.877	1326.02
2 years	42	37	1604*	0.769	1233.48
					4029.50

* Includes training costs of Rs.50 million.

Analysis of Proposal Number 2 (Manufacture)

1. Barrel Factory:

Cash Outflows

(a) Immediate	
i. Cost of new machinery	Rs.300 million
ii. Production set-up costs	Rs. 50 million
iii. Additional working capital	Rs.100 million

Total	Rs.450 million

(b) Years (t = 1-3)

Capacity	50 barrels per year
Fixed cost	Rs.200 million
Variable cost (50 X 10) million	Rs.500 million

Total	Rs.700 million

(c) Fourth year

Capacity	50 barrels per year
Fixed cost	Rs.200 million
Variable cost (50 X 10 million)	Rs.500 million
Less: Release of working capital	Rs. 100 million
Total	Rs.600 million

Calculation of present value of cash outflows:

<i>Payment time</i>	<i>Cash flow (Million Rs)</i>	<i>PV factor at 14 percent</i>	<i>Present value (million Rs)</i>
Immediate	450	1.000	450.00
1-3 year	700	2.322	1625.40
4 th year	600	0.592	355.20
			2430.00

2. Gun Carriage Factory

(a) Potential loss due to loss to existing production

(i) Number of chassis	7,000
(ii) Contribution margin per chassis	Rs.20, 000
(iii) Existing contribution (7,000 X 20,000)	Rs.140 million

(b) Cost of Gun Carriage

(i) Variable cost (50 X 5 million)	Rs.250 million
(ii) Additional fixed cost	Rs.150 million
© Assembling cost (50 X 2 million)	Rs.100 million
(d) Testing/Proofing costs (50 X 1 million)	Rs. 50 million

Total recurring cost (a+b+c+d) Rs. 690 million

Calculation of Present Value

- (i) Immediate expenditure (cost of retooling): rs.50 million
- (ii) Expenditure for years (1-4): Rs.690 million

<i>Year</i>	<i>Cash flow (Million Rs)</i>	<i>PV factor at 14 percent</i>	<i>Total PV (million Rs)</i>
0	50.00	1.0000	50.000
1-4	690.00	2.9137	2010.453
			2060.453

Total Present Value

Million Rs.

Barrel factory	2430.600
Gun carriage	2060.453

	449.053

Recommendations

1. Proposal 1 related to import of guns is cheaper.
2. The following additional points may, however, be considered before taking a final decision on the subject.

(a) There is an element of uncertainty associated with import of weapons from 'Mitra Desh'. The geopolitical environment expected in the next three to four years and its likely effect on the sale of guns needs to be evaluated.

(b) Proposal 2 involves closing down an existing production of chassis for Malaysia. Though the financial effects of this action have been evaluated, the overall effect that it may have on further trade relations with Malaysia needs to be evaluated.

(c) There will still be a residual life of the machines set up for the barrel factory after completion of production of 200 guns barrels. Additional orders for guns by the Indian Army for exports may make this proposal attractive.

Case Study No.2 - Helicopters

Pharmax has long been regarded as a well managed company with a turnover of Rs.380 crores. It engages mainly in production of bulk drugs, pharmaceuticals, vitamins, hormones and few others very high value products. The company is located in a remote hilly area because of availability of raw materials in abundance from a nearby region.

Statement of the Problem

The company has been hiring helicopters (as it is not possible to use trucks or railway wagons because of hilly terrain from 'Pawan Hans') for transportation of raw materials, finished products as well as for some other purposes. Two years ago they had their own helipad which then cost them Rs.1 million. The total hiring charges are Rs.60, 000 per hour, which included running and maintenance. Records of past two years show that on an average, helicopters had been hired for 20 hours a month. However, as per contract with 'Pawan Hans', the company had to pay for a minimum of 30 hours a month.

Now there is an offer from Paris Aircraft Company (a French company) of a new helicopter for FFr 12 million with a useful life of 8 years. The French company has assured Pharmax that the salvage value of the helicopter will easily be FFr 1.2 million (10

percent of the initial cost) at the end of eight years. The company tried to convince Pharmax about profitability of the proposal and is ready to buy back the helicopter after 8 years for FFr 1.2 million.

Pharmax has some retained earnings and can also obtain adequate funds from outside investors, if necessary, but before that it wants to be sure that the investment is financially viable.

Current exchange rate	:	Rs.6.65 = FFr 1.00
Projected exchange rate after 8 years	:	Rs.7.50 – FFr 1.00

Operating Parameters

Essential parameters used in the financial analysis are as follows:

(a) <i>Existing Scenario</i>	:	Rs.60,000 per hour
------------------------------	---	--------------------

Hiring charges

Number of hours a month for which Helicopter is hired	:	20 hours per month
--	---	--------------------

Payment is done for a minimum

30 hours a month

Total hiring charges (60,000 X 30 X 12)	:	Rs. 21.6 million
--	---	------------------

(b) Proposed Scenario

In case a new helicopter is bought, management can also hire it out during off hours, hiring out charges would be Rs.75, 000 per hour. However, a maximum of only 5 hours a month (or 60 hours per annum) would be available for hiring out.

When a New Helicopter is bought

Cost of the helicopter (12 million X 6.65)	:	Rs.79.8 million
Life of the helicopter	:	8 years
Salvage value (1.2 million X 7.50) (After 8 years)	:	Rs.9 million
Annual depreciation	:	(Rs.79.8 – Rs.9)/8
(Assuming straight line method of depreciation)		Rs.8.85 million

Insurance cost (1 percent of cost) : Rs. 0.798 million per annum

Running and Maintenance costs

1-4 years : Rs.2.5 million

5-8 years : Rs.5.0 million

Manpower Costs

Pilots (each year for 1-4 years)
Rs.40, 000 per month (2 X 40,000 X 12) : Rs.0.96 million per annum
5-8 years (Rs.44, 000 per month)
(2 X 44,000 X 12) : Rs.1.056 million per annum

Assumptions: Salary is expected to increase by 10 percent after 4 years both for pilots and ground staff.

Ground staff

1-4 years (Rs.15, 000 per months each)
(2 X 15,000 X 12 : Rs.0.36 million per annum
5-8 years (Rs.16, 500 per month each)
(2 X 16,500 X 12) : Rs.0.396 million per annum

Total Manpower Costs

1-4 years: (0.96 + 0.36) : Rs.1.32 million per annum
5-8 years: (1.056 + 0.396) : Rs.1.452 million per annum

Minimum Required Rate of Return: : 15 percent

Solution

Financial Analysis of Decision of Buying New Helicopter

(A) Total incremental cash outflows:
Cost of helicopter: Rs.79.8 million

(B) Total incremental cash inflows after taxes:

Cash inflow	Period 1-4 years (Rs. million)	Period 5-8 years (Rs. million)
Savings in hiring helicopter	21.6	21.6

Hiring out income	4.5	4.5
	-----	-----
Gross income	26.1	26.1
Less running and maintenance costs	(2.5)	(5.0)
Insurance costs	(0.798)	(0.798)
Manpower costs	(1.32)	(1.452)
Depreciation	(8.85)	(8.85)
	-----	-----
Earnings before tax	12.632	10.00
Less: Taxes (50 percent)	6.316	5.00
	-----	-----
Earnings after tax	6.316	5.00
Add: Depreciation	8.85	8.85
	-----	-----
Incremental cash flow after tax (CFAT)	15.166	13.85

© Determination of NPV (Discount rate 15 percent per annum)

<i>Year</i>	<i>CFAT</i> <i>(Rs. million)</i>	<i>PV Factor</i>	<i>Total PV</i> <i>(Rs. million)</i>
1-4	15.166	2.855	43.29893
5-8	13.85	1.632*	22.6032
8	9.0	0.327	2.943
	(Salvage value)		-----
		Total PV	68.84513
		Less cash outflows	79.80

		Net present value	(10.95487)

* (4.487 – 2.855)

Recommendations

Since the NPV for the proposal of buying a new helicopter is negative, it is financially not viable.

However, there are some qualitative aspects which merit consideration in final decision making. There are as follows:

- (i) For the past two years, the company had been facing problems in getting a helicopter booked for its use on appropriate days. This had been due to a large demand for the helicopter service in the market.

- (ii) High value products manufactured by the firm as well as raw materials utilized get degraded if kept in open atmosphere for a long time. The hired helicopter usually arrived late and the pilot often showed indifference to the gravity of problem which the company could ill afford. With its own helicopter, the company can transport materials freely as and when required, with greater speed and higher efficiency.
- (iii) 'Pawan Hans' may refuse the use of its helicopter in some perceived dangerous areas on the hills (in spite of all assurance from Ranmax). This may lead to non-availability of raw material and hence adversely affect the business of the firm. With its own helicopter, the company can carefully plan to carry out such operations too.

(Source: International Financial Management by Professors P.K.Jain, Josette Peyrard and Surendra.S.Yadav)

LEARNING UNIT - VII

International Financial Management

[Guide for Group Activities]

Administrative Training Institute
Lalithmahal Road, Mysore - 570 011

Learning Unit 7

Guide for Group Activities

E. International Financial Management

This guide has been designed to enable participants to solve problems 1-15 given in the handout on Group Activities in Learning Unit 7. The problems and solutions given in this guide are illustrative and will enable the participant to solve the problems given in Group Activities.

Illustration

Problem 1

You are required to find out the overall balance, showing clearly all the sub-balances from the following data:

- (1) UC Corporation of the USA invests in India Rs.3, 00,000 to modernize its Indian Subsidiary.
- (2) A tourist from Egypt buys souvenirs worth Rs.3000 to carry with him. He also pays hotel and travel bills of Rs.5, 000 to Delhi Tourist Agency.
- (3) The Indian subsidiary of UC Corporation remits, as usual, Rs.5, 000 as dividends to its parent company in the USA.
- (4) This Indian subsidiary of UC Corporation sells a part of its production in other Asian countries for Rs.1, 00,000.
- (5) The Indian subsidiary borrows a sum of Rs.2, 00,000 (to be paid back in a year's time) from the German money market to resolve its urgent liquidity problem.
- (6) An Indian company buys a machine for Rs.1, 00,000 from Japan and 60 percent payment is made immediately; the remaining amount is to be paid after 3 years.
- (7) An Indian subsidiary of French Company borrows Rs.50, 000 from the Indian public to invest in its modernization programme.

Solution 1

Sources and Uses of Funds

<i>Sl.No.</i>	<i>Sources</i>	<i>Uses</i>	<i>Nature</i>
1.	3,00,000		Direct Foreign Investment
2. (a)	3,000		Goods exported
(b)	5,000		Services (invisible) rendered
3.		5,000	Dividends paid
4.	1,00,000		Goods exported
5.	2,00,000		Short-term borrowing
6. (a)		1,00,000	Equipment imported

(b)	40,000		Increase in claim on India (Portfolio)
	6,48,000	1,05,000	

BOP Statement

A. Current Account

Goods Account

Exports	:	Rs.1, 03,000 (+)
Imports	:	Rs.1, 00,000 (-)
<hr/>		
Balance	:	Rs. 3,000 (+)

Invisible Account

Payment Received	Rs. 5,000 (+)
Payment Made	Rs. 5,000 (-)
<hr/>	
Balance	Nil

Current Account Balance: Rs.3, 000(+)

B. Capital Account

Foreign Direct Investment

Inflow	:	Rs. 3, 00,000 (+)
Outflow	:	Nil
<hr/>		
Balance	:	Rs. 3, 00,000 (+)

Portfolio Investment

Inflow	:	Rs. 40,000 (+)
Outflow	:	Nil
<hr/>		
Balance	:	40,000 (+)

Long-term Capital Balance: Rs.3, 40,000 (+)

(FDI + Portfolio)

Short-term Capital Account

Inflow	:	Rs.2, 00,000 (+)
--------	---	------------------

Outflow	:	Nil
<hr/>		
Balance	:	Rs.2, 00,000 (+)

Capital Accounts Balance: Rs.5, 40,000 (+)

Overall Balance Rs. 5, 43,000 (+)

There is a net surplus of Rs.5, 43,000 in the balance of payments. This means, there will be an increase of reserves by this amount.

Note: The transaction No.7 did not enter into the BOP Statement since this transaction does not involve any foreign country. The entire transaction has taken place in Indian rupees within India.

Illustration Problem 2

Convert the following rates into outright rates and indicate their spreads:

	<i>Spot</i>	<i>1-month</i>	<i>3-months</i>	<i>6-months</i>
Rs/\$	35,6300/25	20/25	25/35	30/40
Rs/--	55, 2200/35	40/30	50/35	55/42
Rs/DM	23, 9000/30	30/25	40/60	45/65

Solution 2

(a) Rupee Rate of Dollar

An observation of the figures indicates that the first figure is lower than the second in all 3 forward quotes, implying dollar is being quoted at premium in the forward market. Thus, the points will be added to the corresponding spot rates. Accordingly, the rates are:

	<i>Spot</i>	<i>1-month</i>	<i>3-months</i>	<i>6-months</i>
<i>Bid price</i> (Rs)	35, 6300	35, 6320	35, 6325	35, 6330
<i>Ask Price</i> (Rs)	35, 6325	35, 6350	35, 6360	35, 6365
<i>Spread</i> (Rs)	0.0025	0.0030	0.0035	0.0035

(b) Rupee Rate of Pound Sterling

While observing figures of forward quotation, it is clear that pound sterling is at discount in the forward market since points corresponding to the bid price are higher than those corresponding to the ask price. Therefore, the forward points will be subtracted from the spot rate figures. Thus, outright rates are:

	<i>Spot</i>	<i>1-month</i>	<i>3-months</i>	<i>6-months</i>
<i>Bid price</i> (Rs)	55, 2200	55, 2160	55, 2150	55, 2145
<i>Ask Price</i> (Rs)	55, 2235	55, 2205	55, 2200	55, 2193
<i>Spread</i> (Rs)	0.0035	0.0045	0.0050	0.0048

© Rupee Rate of Deutschmark

Figures as given indicate that 1-month forward DM is at discount whereas 3-months and 6-months forward rates are at premium. So, for 1-month forward corresponding points will be subtracted from outright spot rates while points corresponding to 3-months and 6-months forward will be added. Thus, outright rates are:

	<i>Spot</i>	<i>1-month</i>	<i>3-months</i>	<i>6-months</i>
<i>Bid price</i> (Rs)	23, 9000	23, 8970	23, 9040	23, 9045
<i>Ask Price</i> (Rs)	23, 9030	23, 9005	23, 9090	23, 9095
<i>Spread</i> (Rs)	0.0030	0.0035	0.0050	0.0050

Illustration

Problem 3

Given the following data:

Spot rate: Rs.350020 = \$ 1

6-months forward rate: Rs.35, 9010 = \$.1

Annualized interest rate on 6-months rupee: 12 percent

Annualized interest rate on 6-months dollar: 7 percent

Work out the arbitrage possibilities.

Solution 3:

It is clear from the data that 6-months forward US\$ is quoting at premium, which is calculated as below:

$$\text{Premium} = \frac{35.9010 - 35.0020}{35.20} \times \frac{12}{6} \times 100 = 5.136 \text{ percent}$$

Interest rate differential = $12 - 7 = 5$ percent

Since the interest rate differential is smaller than the premium, it would be advantageous to place money in US dollars, the currency whose 6-months interest rate is lower.

An operator would take the following steps:

- (i) Borrow Rs.1000 at 12 percent for 6 months.
- (ii) Convert this sum at the spot rate to obtain US\$ 28.5697 ($=1000/35.0020$).
- (iii) Place the dollars at 7 percent in the money market for 6 months to receive \$ $28.5697 \times (7 \times 6/12 \times 1/100 + 1) = \$ 29.5696$.
- (iv) Sell US\$ at 6-months forward that gives:

$$\text{Rs.}29.5696 \times 35.9010 = \text{Rs.}1061.5782$$

- (v) Refund the rupee debt taken at 12 percent; the amount to be refunded is: Rs 1000 $(1 + 12 \times 6/12 \times 1/100) = \text{Rs.}1060$

$$\text{Net gain} = \text{Rs.}1061.5782 - \text{Rs.}1060 = \text{Rs.}1.5782$$

Gain on transaction turns out to be small/negligible; it will emerge to be significant if the sum involved is substantial (say Rs.1 million). Accordingly, the gain would be Rs.1,57,820, i.e.

$$\frac{\text{Rs. } 15782}{\text{Rs. } 1000} \times \text{Rs. } 10,00,000$$

Illustration

Problem 4

If the \$: Yen spot rate is \$ 1 = Yen 110 and interest rates in Tokyo and New York are 3 and 4.5 percent respectively, what is the expected dollar yen exchange rate one year hence?

Solution 4:

According to interest rate parity, the future exchange rate is expressed by

$$\begin{aligned}C_T &= C_O \frac{1 + t_D}{1 + t_E} \\&= 110 \times \frac{1 + 0.03}{1 + 0.045} \\&= 108.42 \text{ or } \$ 1 = \text{Yen } 108.42\end{aligned}$$

As US interest rates are relatively higher, dollar has undergone depreciation with respect to yen.

Illustration

Problem 5

The US inflation rate is expected to average about 4 percent annually, while the Indian rate of inflation is expected to average about 12 percent annually. If the current spot rate for the rupee is \$ 0.0285, what is the expected spot rate in two years?

Solution 5

According to purchasing power parity theory, the expected spot rate for the rupee in one year would be

$$\$ 0.0285 \times (1.04/1.12)$$

Similarly, the spot rate for the rupee in two years is going to be

$$\begin{aligned}& \$ 0.0285 \times (1.04/1.12) \times 1.04/1.12 \\& = \$ 0.0285 \times (1.04/1.12)_2 = \$ 0.0245\end{aligned}$$

Illustration

Problem 6

An Indian exporting firm, Rohit and Bros, would like to cover itself against a likely depreciation of pound sterling. The following data is given:

Receivables of Rohit and Bros: ---- 500,000

Spot rate: Rs.56.00/-/\$

Payment date: 3-months

3-months interest rate: India: 12 percent per annum

UK: 5 percent per annum

What should the exporter do?

Solution 6

Since no other data is available, the only thing that Rohit and Bros can do is to cover itself in the money market. The following steps are required to be taken:

- (i) Borrow pound sterling for 3-months. The borrowing has to be such that at the end of three months, the amount becomes \$ 500,000. Say, the amount borrowed is \$D. Therefore,

$$D \left[1 + 0.05 \times \frac{3}{12} \right] = 500,000 \text{ or } D = \$ 493,827$$

- (ii) Convert the borrowed sum into rupees at the spot rate. This gives:
Rs.493,827 X 56 = Rs.27,654,312
- (iii) The sum thus obtained is placed in the money market at 12 percent to obtain at the end of 3-months:

$$S = 27,654,312 \times \left[1 + 0.12 \times \frac{3}{12} \right] \text{ Rs.28, 483,941}$$

- (iv) The sum of \$500,000 received from the client at the end of 3-months is used to refund the loan taken earlier.

From the calculations, it is clear that the money market operation has resulted into a net gain of Rs.483941 (=28,483,941 – 500,000 X 56).

If pound sterling has depreciated in the meantime, the gain would be even bigger.

Illustration

Problem 7

A UK importer has to pay \$ 100,000 in a month's time. He fears an appreciation of the dollar. What can he do with the knowledge of the following data?

1-m interest rate: US\$: 4 percent

UK \$: 5 percent

Spot rate: \$ 1.5537/-£

Solution 7

Since only the money market data are available, the UK importer has to work out possibilities that exist for him to cover himself in the money market. He can take the following steps:

- (i) Buy S dollars at the spot rate and place them in the money market so as to obtain \$ 100,000 in a month's time. That is,

$$S \left[1 + 0.04 \times \frac{1}{12} \right] = 100,000$$

Or

$$S = \$ 99,668.$$

- (ii) In order to buy S dollars, the equivalent amount of pound sterling is required to be borrowed. The borrowing B is,

$$B = \frac{99668}{1.5537} = \$64,149$$

- (iii) Refund the sterling loan after one month. The refunded amount would be:

$$R = 64149 \left[1 + 0.05 \times \frac{1}{12} \right] = \$64,416.3$$

- (iv) In the meantime the sum of S dollars placed in the money market would mature to \$ 100,000. Use this sum to pay the payable due.

The cost of covering in the money market works out to \$ 53.81

$$[= 64,416.3 - \frac{100,000}{1.5537}]$$

1.5537

In case, the dollar had appreciated and the payable was not hedged, the loss would have been greater. Even 1 percent depreciation of pound sterling (\$ 1.5382/-) would require a payment of \$ 65,013, which means a loss of about \$ 650.

Illustration Problem 8

An Indian subsidiary of a UK multinational has a translation exposure of Rs.10 million. The rates are as follows:

Spot: Rs.55, 0000/-
One-year forward: Rs.56, 3200/-

A 4 percent depreciation of the rupee is expected. How can the exchange risk be hedged?

Solution 8

The anticipated rate after expected depreciation would be: Rs.57.2000/-

Suppose, no action is taken to hedge the risk. In that case, the company will suffer a translation loss equal to:

$$= \$ \left[\frac{10 \text{ million}}{55} - \frac{10 \text{ million}}{57.2} \right] = \$ 6993$$

To avoid this loss, the company will do well to buy pound sterling forward (or sell rupee forward) such that the difference is equal to the anticipated loss. Say, it sells Rs.X. Then,

$$\begin{aligned} 6993 &= X (\text{Forward rate} - \text{Anticipated rate}) \\ &= X \left[\frac{1}{56.3200} - \frac{1}{57.2000} \right] \end{aligned}$$

or

$$\begin{aligned} 6993 &= X (0.017755680 - 0.017482517) \\ \text{Or } X &= \text{Rs.25, 599,974} \end{aligned}$$

This amount of rupees will give the following amount of pound sterling in the forward market:

$$\frac{25,599,974}{56,3200} = \$ 454,545.45$$

However, if the anticipated depreciation of the rupee (or appreciation of pound sterling) does take place, the company will buy the Rs.X back, with less amount of pounds sterling. That is, for

$$\frac{25,599,974}{57.2} = \$ 447,555.99$$

The difference between the two (\$ 454,545.50 - \$ 447,555.99) is equal to the loss (\$ 6989.51) that would have accrued without hedging.

Illustration

Problem 9

Total translation exposure of a company is Rs.1.5 million. This exposure is in French francs. Interest rates are 8 and 11 percent for the franc and the rupee respectively. How is hedging to be done? Spot rate is Rs.6 per FFr. The rupee is likely to depreciate by 6 percent.

Solution 9

Since only the interest rate data is available, the hedging operation is to be done in the money market. The following steps are involved:

- (1) Borrow Rs.1.5 million at 11 percent and convert them into French Francs at spot rate to obtain:

Rs.1.5 million	
-----	= 0.25 million FFr
6	

- (2) Place FFr 0.25 million in the money market for a year at 8 percent.

This would give FFr 0.27 million after a year.

- (3) The sum thus obtained is converted into rupees. If the anticipated depreciation of 6 percent does take place, the rate would settle at Rs.6.36/FFr. So, the amount in rupees at the end of the year would be Rs.(0.27 million X 6.36) = Rs.1.7172 Million.
- (4) Refund the rupee loan with interest. The refund amount works out to Rs. (1.5 million X 1.11) = Rs.1.665 million.

Thus, the hedging operation would result into a net gain of Rs.52, 200 (=Rs.1.7172 million – Rs.1.665 million). The gain in French franc would be FFr 8,208.

Illustration

Problem 10

A French company imports in January equipment from the USA for \$ 6 million. The payment in US dollars is due in June. The importer fears an appreciation of US dollars. The spot rate is \$ 0.2/FFr. The FFr future contract for June is quoted at \$ 0.19/FFr. What should the French importer do? Assume further spot rate on settlement date is \$ 0.185/FFr and the future contract is likely to be quoted at \$ 0.178/FFr. What is the hedging efficiency?

Solution 9

The US dollar is likely to appreciate against the French francs. This also means that the French franc would depreciate.

To guard against the depreciation of the French franc, the importer can sell French franc future contracts. The amount involved is \$ 6 million or FFr 30 million (=6 million/0.2). Thus, the total number of future contracts to be sold is 60 (=30 million/0.5 million), since the value of one future contract is FFr 500,000.

The French importer deposits the security amount with the Clearing House. During the period January-June, the importer will pay margins if the FFr rises and have its account credited if the FFr slips. On the due date in June the contract is closed (or repurchased). Say, the spot rate on the due date is \$ 0.18/FFr and the future contract is being quoted at \$ 0.178/FFr.

The importer makes a loss: FFr $(6/0.2 - 6/0.185)$ million = FFr 2.432432 million. However, on the future market, it makes a gain equal to \$ $(0.19 - 0.178) \times 60 \times 500,000$ = \$ 360,000 = FFr $360,000/0.185$ = FFr 1,945,946.

$$\text{Net loss} = \text{FFr } 2,432,432 - 1,945,945 = \text{FFr } 486,486.$$

Note: The loss is not fully covered as spot rate deteriorated more than the future rate. Hedge efficiency can be defined as the ratio between the gains made on the future market and the loss payable due to the rate movement on spot market. It is equal to $1,945,946/2,432,432 \times 100 = 80$ percent.

Illustration

Problem 11

A company will receive \$ 5.5 million in three months (March) from now. It will like to place this sum for six months in Euro-dollar market. The rates are likely to go down. The current rate is 1 percent over and above that of LIBOR, which is 9 percent. Euro-dollar 3 months interest future is quoted at 90. What can the company do?

Solution 11

Since the company is likely to suffer the loss of opportunity if the rates go down, it buys the interest future contract. The number of contracts to be bought should be either 5 or 6 since the value of one contract is \$ 1 million.

Suppose the company buys 6 contracts, and the rates after 3 months are as follows:

LIBOR: 8.3 percent

Interest rate future: 90.5

Thus, the loss of opportunity for the company due to fall in the rates is:

$$5.5 \times \frac{9 - 8.3}{100} \times 10_6 \times \frac{6}{12} = \$ 19,250$$

On the other hand, the gain on the future contracts is $6 \times (90.5 - 90) \times 100 \times 25 = \$ 7,500$

The net loss is \$ (19,250 – 7,500) or \$ 11,750

The loss is not covered fully because of the difference in basis as the fall in interest rate is not totally reflected into the contract quotes, as also the amount to be covered is not in exact multiples of the contract value of Euro-dollar rate future.

Illustration

Problem 12

A company is to borrow DM 2.5 million DM 2.5 million in December for 3 months. At the moment (September), the December DM future is being quoted at 92.5. The market rate of Euro-DM is 7.5 percent, which is likely to go up in months to come.

What should the company do? Assume that on 15 December, the DM future has fallen to 91.5 and the Euro-DM rates are 8.6 percent.

Solution 12

Since the DM borrowing rate is likely to go up between September and December, the company will do well to sell DM future contracts to cover against interest rate risk.

The value of one Euro-DM future contract is DM 1 million while the sum to be hedged is DM 2.5 million. So the company has to sell either 2 contracts or 3 contracts. Let us say, it sells 3 of them.

On December 15, the company borrows at 8.6 percent. The sum that it would receive for the face value of DM 2.5 million is found by the price yield formula:

$$\text{Bond price} = \text{Face value} \left[1 - \frac{\text{Yield} \times N}{360} \right]$$

where N is the borrowing period in days.

$$\text{So the sum realized is } 2.5 \left[1 - \frac{0.086 \times 90}{360} \right] = \text{DM } 2.44625 \text{ million.}$$

But the sum that would have been realized at the yield rate of 7.5 percent is

$$2.5 \left[1 - \frac{0.075 \times 90}{360} \right] = \text{DM } 2.453125 \text{ million}$$

$$\text{So shortfall} = \text{DM } 2.453125 - \text{DM } 2.44625 = \text{DM } 6,875$$

Now the company buys back the future contracts. The gain is equal to 100 ticks (= 92.5 - 91.5). So the gain is

$$3 \times 100 \times 25 = \text{DM } 7,500$$

Thus, shortfall is more than made up through the hedging operation.

Illustration

Problem 13

A company plans to borrow \$ 20 million by issuing a 90 days commercial paper in August. The yield rate of the CP is 10.5 percent at the moment, i.e. the month of March. Interest rates are anticipated to rise. Since no future contracts are available in CP, the company can resort to T-bill futures. September T-bill futures are being quoted at 90.20.

Assume that on August 15, the CP yield has risen to 11 percent and T-bill future contract is quoting at 89.60. What is the company expected to do?

Solution 13

In March, at the yield rate of 10.5 percent, the CP issue will result into a realization of

$$20 \left[1 - \frac{0.105 \times 90}{360} \right] = \$ 19.475 \text{ million}$$

But in August, the sum realized is going to be:

$$20 \left[1 - \frac{0.11 \times 90}{360} \right] = \$ 19.45 \text{ million}$$

The shortfall = \$ 0.025 million = \$ 25,000

To hedge against the interest rate rise, the company sells 20 T-bill September future contracts and repurchases them on August 15.

The gain on the future contract is 90.2 – 89.6 or 60 ticks. This is equal to 20 X 60 X 25 = \$ 30,000

Thus, the shortfall is more than compensated by hedging.

Illustration

Problem 14

A treasury manager after five months will need to borrow Rs.300,000 months. The current rates are as follows:

<i>Duration</i>	<i>Borrowing rates (Percent)</i>	<i>Lending rates (Percent)</i>
3-months	9.5	10.0
5-months	9.8	10.2
8-months	10.0	10.5
9-months	10.2	10.8

The manager wants to ensure the rate that he would have to pay on his borrowings. What should he do and what is the rate he can lock in?

Solution 14

Since he has to borrow after 5 months for a period of 3 months, the rates that concern him are those corresponding to 5 months and 8 months.

He should borrow for 8 months at 10.5 percent and lend this sum immediately for 5 months at 9.8 percent. Let us say his effective rate is *I*.

$$\left[1 + 0.098 \times \frac{5}{12}\right] \left[1 + \frac{i}{100} \times \frac{3}{12}\right] = \left[1 + 0.105 \times \frac{8}{12}\right]$$

or

$$I = 11.2 \text{ percent}$$

Thus, the treasury manager has been able to lock in an effective rate of 11.2 percent. The interest on his borrowings would amount to:

Illustration

Problem 15

A company will need to buy after 4 months a forward rate agreement (FRA) from a bank to borrow for 3 months. The 4/7 FRA is quoted at 6.5. What will the company do if after 4 months, the rate?

- (a) rises to 7 percent
- (b) falls to 6 percent
- (c) remains at 6.5 percent

Solution 15

- (a) Since the rate has risen, the counter-party (the bank in this case) will pay the difference to the company. Say, the borrowings are planned for \$ 1 million. Then the counter-party is to pay to the company:

$$\begin{aligned} & (0.07 - 0.06) \times 1,000,000 \times \frac{3}{12} \\ & = \$ 2500 \end{aligned}$$

- (b) Since the rate has fallen to 6 percent, the company will pay to the bank, an amount:

$$\begin{aligned} & (0.065 - 0.06) \times 1,000,000 \times \frac{3}{12} \\ & \$ 1250. \end{aligned}$$

- © Since there has been no change in the rate, neither the bank nor the Company pays or receives.

(Source: Book on International Financial Management by professors P.K.Jain, Josette Peyrard and Surendra S Yadav)

LEARNING UNIT - VII

**International
Financial Management**

[READING MATERIAL]

Administrative Training Institute
Lalithmahal Road, Mysore - 570 011

Learning Unit 7

Reading Material

International Financial Management

(Selected extracts from the Book on International Finance Management by Professors
P.K.Jain, Josette Peyrard and Surendra S Yadav)

1. General Introduction

International Financial Management is the management of the financial operations relating to international activities of business organizations, in the form of expansion of existing business in foreign countries, decision of setting up a plant abroad or participating in the investment in another country. Setting up of joint ventures, exporting and importing of goods and services, financing of subsidiaries abroad and distribution of dividends on the profits earned by a multinationals etc.,

The process of economic reforms and globalization and the emphasis on privatization by the World Bank and IMF, increased international economic activity.

The following are the important stake holders for international Financial Management

- Multinational corporations having subsidiaries in several countries.
- Public sector companies dealing with foreign companies;
- Small enterprises that may have to deal with foreign companies once in a while ;
- Banks and financial establishments.

2. Balance Of Payments

Balance of Payments (BOP) records commercial, financial and economic flows between the residents of a given country and those of the rest of the world during a certain period of time, generally a year. It measures flows rather than stock.

The resident of a country means any individual, business organization, government agency or any other institution.

A BOP statement is kept in the form of sources (credits) and uses (debits) of funds. This record enables us to know whether the country has/had a net surplus or deficit during the referred period. If a country receives more funds from abroad than it spends, it has a surplus of BOP. If expenditures abroad by residents exceed what the residents earn or receive from abroad, the country has a deficit of BOP.

The major sources of funds for a country accrue from:

- Exports of goods and services;
- Sale of existing foreign financial assets ;

- Foreign loans/borrowings, etc.

Likewise, the major uses are:

- Imports of goods and services ;
- Purchase of foreign financial assets ;
- Foreign lending's and so on.

Obviously, sources increase the external purchasing power of a country; conversely uses decrease its purchasing power.

3. Presentation Of Balance Of Payments

A BOP statement is divided into (i) Current account, (ii) Capital account and (iii) Official reserves account.

The data needed to prepare different accounts are collected from various sources. The data on imports and exports are gathered from customs authorities.

The Current Account is a record of the trade in goods and services among countries. The trade in goods is composed of exports and imports.

The trade in services (also called invisibles) includes interest, dividends, tourism/ travel expenses and financial charges, etc.

Unilateral transfers consist of remittances by migrants to their kith and kin, and gifts, donations and subsidies received from abroad.

The Capital Account is divided into foreign direct investment (FDI), portfolio investment and private short-term capital flows. FDI's are for relatively longer period of time and portfolio investments have a maturity of more than one year when they are made. The short-term capital flows mature in a period of less than one year.

Table 1 Typical BOP Statement

A. Current Accounts

Goods Account

Exports (+)

Imports (-)

Balance on Goods Account = A(I)

Services Account

Receipts as interest and dividends, tourism receipts for travel and financial changes (+)

Payments as interest and dividends, tourism payments for travel and financial charges (-)

Balance on Services Account = A(II)

Unilateral Transfers

Gifts, donations, subsidies received from foreigners (+)

Gifts, donations, subsidies made to foreigners (-)

Balance on Unilateral Transfers Account = A(III)

Current Account Balance: $A(I) + A(II) + A(III)$

B. Long-term Capital Account

Foreign Direct Investment (FDI)

Direct investment by foreigners (+)

Direct investment abroad (-)

Balance on Direct Foreign Investment = B(I)

Portfolio Investment

Foreigner's investment in the securities of the country (+)

Investment in securities abroad (-)

Balance on Portfolio Investment = B(II)

Balance on Long-term Capital Account = $B(I) + B(II)$

Private Short-term Capital Flows

Foreigners' claim on the country (+)

Short-term claim on foreigners (-)

Balance on Short-term Private Capital Account = B(III)

Overall Balance : $[A(I) + A(II) + A(III) + [B(I) + B(II) + B(III)]$

C. Official Reserves Account

a. Decrease or increase in foreign exchange reserves.

As regards official reserves accounts, the monetary authority of a country, usually the central bank, owns international reserves. These reserves are composed of gold, convertible currencies like US Dollar, Deutschmark, Japanese, Yen, SDR (Special Drawing Rights), etc. Since BOP is expressed in national currency, an increase in any of these assets means a use of funds while their decrease implies a source of funds.

If overall balance (current plus capital) is in deficit, this implies either a reduction in reserves or an increase in foreign debt or reduction of credits. It is important to note that, by convention, a deficit is shown by + sign. In other words, it appears on the sources side. As a result, sum of all sources and uses becomes equal. The reverse is true when the overall balance (i.e., the sum of current and capital account) is in surplus.

If a country has significant deficit, it will have a tendency to take stiff measures for diminishing its imports, exchange control.

BOP provides foresight regarding the type of exchange rates (increase/decrease) to prevail; consistent deficit of BOP has an unfavorable effect on exchange rate/

Devaluation etc., BOP statements may be prepared in two currencies.

Adjustments between demand for and supply of foreign currency take place through the intervention of central bank, or market, or by administrative measures.

Central bank intervenes through its regulatory stocks. This exercise is necessitated to control the volatility of exchange rate as and when it anticipates a surplus over demand (surplus of the BOP) or vice versa.

The national income (or product) is the sum of consumption and savings, that is;

$$\text{National Income} = \text{Consumption} + \text{Savings} \quad (2.1)$$

Similarly, national spending consists of consumption and investment;

$$\text{National Spending} = \text{Consumption} + \text{Investment} \quad (2.2)$$

From Eqs (2.1) and (2.2). We obtain:

$$\text{National Income} - \text{National Spending} = \text{Savings} - \text{Investment} \quad (2.3)$$

This identity says if a nation's income exceeds its spending, then, savings will exceed domestic investment, yielding surplus capital. This surplus capital must be invested overseas. In other words, a nation that produces more than it spends, will save more than it invests domestically and will have a net capital outflow. This capital outflow will appear as a combination of capital account deficit and an increase in official reserves. Conversely, a nation that spends more than it produces will invest domestically more than it saves and have net capital inflow. This capital inflow will appear as a combination of capital account surplus and a reduction of official reserves.

4. International Monetary System

In the context of international trade, the problems that crop up relate to : (i) liquidity, (ii) adjustment, and (iii) stability.

Liquidity is necessary to finance the transactions that are done on cash basis. Adjustment is needed to bridge the gap that emanates because of imbalance between demand and supply at existing exchange rates. Similarly, stability is necessary with intent to limit the degree of uncertainty in international business decisions.

5. Evolution Of International Monetary System

The international monetary system, passed through a period of transition from the system of fixed exchange rates to the system of floating rates.

Gold Exchange Standard system. Put into effect in 1850. In this system, each currency was linked to a weight of gold. Since gold was convertible into currencies of the major developed countries, central banks of different countries either held gold or the currency of these developed countries.

On the Bretton Woods conference held, following decisions had been taken:

- Fixed rates in terms of gold, but only the US dollar was convertible into gold.
- A procedure for mutual international credits.
- Creation of International Monetary Fund (IMF) to supervise and ensure smooth functioning of the system. Countries were expected to pursue the economic and monetary policies in a manner so that fluctuations of currency remained within a permitted margin of ± 1 per cent. That is, the central bank of every country had to intervene to buy or sell foreign exchange, depending on the need.
- Devaluations or reevaluations of more than 5 per cent had to be done with the permission of the IMF, to avoid chain devaluations.

The main functions of the IMF are:

- to help member countries in stabilizing their currency ;
- to supervise the evolution of exchange rates and provide guidance to countries on their exchange rate policies;
- to accord temporary financing to tide over balance of payments difficulties.

The capital of the IMF is constituted by the totality of the subscriptions of member states, known as quotas. These quotas are determined as per the economic importance of each country reflected/measured in terms of national income, exports, etc. In 1994, the capital of the IMF was SDR 144.6 billion.

Since 1970, a new instrument of reserve has been created, namely SDR (Special Drawing Right). The value of SDR represents a weighted average of 5 currencies, that is, the US dollar (40 per cent), German Deutschmark (21 per cent), the UK pound sterling (11 per cent), the French franc (11 per cent), and the Japanese yen (17 per cent). These weights reflect the relative strength of economies of these countries.

The quotas of different countries are paid to the IMF in the ratio of 25 per cent as SDRs and 75 per cent in national currency.

Besides the quotas of member countries as explained above, the IMF can also have recourse to loans from member states to augment its resources. These loans are drawn in SDRs.

Also, under the General Agreement to Borrow (GAB) signed by the Group of Ten, (Paris club) the IMF can borrow in order to have supplementary resources in convertible currencies. This agreement allows the IMF to finance from this borrowing even those countries which are not members of the Group of Ten. The agreement is renewed every 5 years; the last one was in 1993.

Good functioning of the international monetary system requires:

- appropriate adjustment mechanisms ;
- an attentive surveillance of the policies adopted by the member states relating to the exchange rate.

Member countries have an absolute claim on the IMF up to the amount of gold subscriptions they have made. In operational terms, they can draw this amount (equal to 25 per cent of their quota) from the IMF any time. This is called reserve tranche (or gold tranche) and is treated as the reserve of the country concerned. However, this sum is to be reimbursed to the IMF within a specified period varying between 3 months to 5 years.

Beyond 25 per cent, a country can draw upon its credit tranche: the additional credit the IMF can grant. The credit tranche consist of the amount of drawings beyond the reserve or gold tranche that would raise the Fund's total holdings of that country to 200 per cent of the quota. Temporary increases of the credit tranche to 400 per cent of the quota have been allowed in the past. Approval from the IMF is necessary for a country to draw on its credit tranche. This approval usually comes with restrictions that become increasingly tight as the drawings on this credit rise. Thus, this additional credit is used more often to finance temporary disequilibrium in balance of payments than to provide temporary liquidity.

Besides the reserve (or gold) and credit tranches, the IMF has three permanent credit facilities : (i) the compensatory financing facility (established in 1963 and liberalized in 1975); (ii) the buffer stock financing facility (established in 1969); and (iii) the extended facility (established in 1974 and expanded in 1983). There are other temporary facilities

created in response to specific needs such as oil price increases, and the Special Emergency Fund created by the General Agreement to Borrow (GAB).

The IMF exercises a firm surveillance on the exchange rate policy of the member states and adopts specific principles to guide them. In order that the system of exchange rate be effective, the Fund recommends adoption of an anti-inflationary policy.

6. European Monetary System

The European Economic Community (EEC) established in 1957 with objectives of (i) a Customs Union, and (ii) free movement of goods, manpower and capital.

In 1978, European Monetary System (EMS) was established.

- 1) To promote and enhance monetary stability in the European Community.
- 2) Working towards the improvement of the general and economic situation of the countries of the European Union in terms of growth, full employment, standard of living, reduction of regional disparities, etc.

The following are the characteristics of EMS :

- There is a single uniform monetary unit of the European Union.
- A stable but adjustable exchange rate has emerged.

7. European Currency Unit (ECU)

The ECU is the central element of the EMS. It is a basket composed of different currencies of the European Union, weighted according to the economic strengths of each one of them. Another important premise is that central banks of parties to the EMS are required to defend the fluctuations in the exchange rates of their currencies.

The ECU is a unit of payment among central banks of the European Union. It is also used for according financial assistance to member states which face economic difficulties due to BOP. 'Private ECU' has also found a greater reckoning in the market. It is treated by banks as a currency and all monetary instruments (such as, long-term borrowings and inter-bank credits, short-term commercial paper, Euro-bonds, Euro-credits, etc.,) can be documented in ECU. There exist future contracts in ECUs too.

In the international capital markets, the ECU occupies an important place. On the commercial plane, some enterprises have adopted it as the currency of billing; the accounts of some multinationals are made in ECUs.

The exchange mechanism is founded in maintaining, through repeated and compulsory interventions on the exchange market, the bilateral fluctuation limits of the participating currencies. Each currency has a pivot rate fixed in ECUs.

French franc	6.53883
Deutschmark	1.94964
Dutch guilder	2.19674
Belgian franc	40.21223
Irish pound	0.808628
Spanish peseta	154.250
Portuguese escudo	192.854
Danish kroner	7.43679
Austrian schilling	13.7167
British pound	0.786749
Greek drachma	264.513
Italian lira	1793.19

This pivot rate (reference rate) represents the unit of base from which the bilateral rates are derived. For example, we have the following two rates.

8. Maximum Divergence (MD)

In the beginning the currencies could only vary within the narrow limit of ± 2.25 per cent around the pivot rate. On 2nd August 1993, it was decided that the rates could vary within ± 15 per cent of the pivot rate.

European Fund for Monetary Cooperation (EFMC) has been set up to ensure smooth functioning of the EMS. The Fund receives 20 per cent of reserves of each country (Central Bank Reserves); in exchange, it provides ECU reserves in the form of bonds or coupons. These securities of E

FMC are used to serve as instruments of settlement among central banks. For instance, if a central bank needs more ECUs, it can borrow from either EFMC or from another central bank.

The system has created several credit mechanisms; the three major ones being:

- a) Very short-term credit used to be for a maximum period of three months. No limit has been specified for the magnitude of funds involved in a transaction.
- b) Short-term credits. The duration of this credit is three months; it can be renewed twice more. In operational terms, therefore, the credit can be for a maximum period of nine months. It is accorded to the member states to tide over temporary difficulties of BOP.
- c) Medium-term credit. These credits are for a period of two to five years and meant for remedying serious difficulties relating to BOP. They should be accompanied by other economic and monetary measures to effectively deal with BOP crises.

9. European Bank Of Investment (EBI)

The European Bank of Investment was created in 1958 with the major objective of balanced development of different regions of the European Union.

This is the European banking institution to provide long-term financing.

The member states have jointly subscribed to the capital of the EBI. The EBI is very active in the capital markets. It also borrows/operates in the major international markets as well as markets of third countries.

EBI lends for following domains.

Regional development, Trans-European network, Environmental protection and Modernization of industry.

Loans are accorded by the EBI either directly or through another financial institution. These can be given in several currencies or in a single currency like dollar, yen, Swiss franc, ECU, etc.

The EBI is a financial intermediary without the goal of profit making. Its resources essentially consist of borrowing on capital markets. It is backed up by governments of the European Union. Therefore, it enjoys a higher credit-rating on the market (AAA).

In view of its financial standing and sound credit rating, the EBI obtains marginally higher rates on its lendings. The EBI does not accord soft rates (subsidized rates).

The EBI finances big projects through individual loans and those of moderate size through global loans. It also refinances banks and financial institutions, granting loans for such projects.

It limits its financing to 50 per cent of the project cost. Co financing of projects with other lenders is the general rule.

The duration is generally between 7 and 12 years but it may go up to 20 years or more for the infrastructure projects. The duration as well as delay of repayments is adapted to specific characteristics of the investments.

The setting up of EMU in 1991 has been a step towards the introduction of a common currency in the member states of EU.

The Objectives of EMU are:

- a) Adoption of an economic policy, based on a close coordination between economic policies of the member states.
- b) Fixing of irrevocable exchange rates leading to a single currency.

- c) Development of a single monetary policy having an objective of price stability and the support to the economic policies of the Member States in general.

10. European Central Bank :

The responsibilities between the European Central Bank and national Central Banks are to be shared on the following principles:

1. **Principle of non-divisibility of decisions relating to monetary policy.**
The responsibility of defining the monetary policy is to be centralized at the level of the governing council and the top management of the European Central Bank.
2. **Principles of subsidiary :** In the areas which do not exclusively fall within the competence of the European Central Bank, it is expected to intervene only as a last resort, i.e., if it is considered that certain objectives cannot be realized by the national banks, left to themselves.

The European Monetary Institute has been established at Frankfurt. The objective of the Institute is to reinforce the coordination among the Member States and work towards the creation of the European Central Bank. It is required to promote and supervise the economic convergence of different countries as also promote and facilitate the use of ECU.

The Member Countries have to respect 5 criteria in order to have common currency:

- a) Rate of inflation should not be more than 1.5 per cent higher than the mean of three best Member States;
- b) Budgetary deficit should not be more than 3 per cent of GDP, except in the exceptional circumstance;
- c) Public debt should not be higher than 60 per cent of GDP except if it is reducing regularly towards this threshold;
- d) Interest rate should not be more than 2 per cent higher than that of three best States (in matter of inflation);
- e) Country should have been a member of EMS at least for two years, while respecting narrowest fluctuation margins.

On setting up of EMU the entire European Union will have a single currency.

The Maastricht Treaty institutes an European System of Central Bank (ESCB) with supra-national institution, called European Central Bank (ECB). It is the only ECB, which will be authorized to issue bank notes in the European Union; it will exercise full control on the circulation of currencies, participating in ECU and progressively replace ancient currencies of the EU, ECU will then, become a veritable currency, i.e., a real operational currency.

11.Foreign Exchange Market

The foreign exchange market is the market where the currency of one country is exchanged for that of another country and where the rate of exchange is determined. The genesis of Foreign Exchange (FE) market can be traced to the need for foreign currencies arising from:

- International trade;
- Foreign investment; and
- Lending to and borrowing from foreigners.

In order to maintain an equilibrium in the FE market, demand for foreign currency (or the supply of home currency) should equal supply of foreign currency (or the demand for home currency). In operational terms, the demand for all supply of home currency should be equal. In the event of a disequilibrium situation, the monetary authority of the concerned country normally intervenes/steps in to bring out the desired balance by:

- Variation in the exchange rate ; or
- Changes in official reserves; or
- Both.

Foreign exchange rates are quoted either for immediate delivery (spot rate) or for delivery on a future date (forward rate). In practice, delivery in spot market is made two days later.

A FE quotation is the price of a currency expressed in the units of another currency. The quotation can be either direct or indirect. It is direct when quoted as “so many units of local currency per unit of foreign currency”. For example, Rs.35 = US \$ 1, is a direct quotation for US dollars in India.

On the other hand, an indirect quotation is the one where exchange rate is given in terms of variable units of foreign currency as equivalent to a fixed number of units of home currency. For example, in India, US \$ 2.857 = Rs.100 is an indirect quotation.

All quotations in India use the direct method of quotation.

A dealer usually quotes a two-way price for a given currency – the price at which he is buying (bid price) and the price at which he is selling (offer or ask price) the currency. In either case, the currency for which the bid or ask price is given is the unit of the item priced.

Spread means the difference between banks's buying (bid) and selling (offer or ask) rates in an exchange rate quotation or an interest quotation. It fluctuates according to the level of stability in the market, the currency in question, and the volume of the business. Thus, if there is a degree of volatility in an exchange rate, and if business is thin and if (rumors persist about the currency that) the current rate is rumored to be unsustainable, the dealer will protect himself by widening the quote. That is, he will offer less currency while selling but demand more when buying. The spread represents the gross return to the dealer for the risks inherent in "making a market".

Cash rate is the price of any currency other than home currency. In other words, it is the direct relationship between two non-home currencies in a foreign exchange market concerned with or used in transactions in a country to which none of the currencies belongs.

Cash rate or Ready rate is the rate when the exchange³ of currencies takes places on the date of the deal. If delivery is made on the day the contract is booked, it is called a Telegraphic Transfer (TT) or cash or value-day deal.

When the exchange of currencies takes place on the next working day after the date of deal, it is called the TQM (tomorrow) rate.

When the exchange of currencies takes place on the second working day after the date of the deal, it is called the spot rate. This time is allowed to banks to process the necessary paperwork and transfer the funds. Such transfers to and from banks will be effected when their overseas currency accounts are either credited or debited, depending on whether the bank is buying or selling. The rate of the agreed deal on telephone is called the contract date; the value date is the one when the deposit is credited or debited. Normally, a deal done on Tuesday will settled on Thursday and a deal done on Friday will be settled on the following Tuesday. A business day is defined as one in which both banks are open for business in both settlement countries. Most dealings now-a-days are done "spot".

The major currencies quoted on the forward market are given below. They are generally in terms of the US dollar.

- Deutschmark
- Swiss franc
- Pound sterling
- Belgian franc
- Dutch guilder
- Japanese yen
- Peseta
- Canadian dollar
- Australian dollar

12.Theory Of Purchasing Power Parity (Ppp)

This theory was enunciated by Gustav Cassel. Purchasing power of a currency is determined by the amount of goods and services that can be purchased with one unit of that currency. If there is more than one currency, it is fair and equitable that the exchange rate between these currencies provides the same purchasing power for each currency. This referred to as purchasing power parity.

It is ideal if the existing exchange rate is in tune with this cardinal principle of purchasing power parity. On the contrary, if the existing exchange rate is such that purchasing power parity does not exist in economic terms, it is a situation of disequilibrium. It is expected that the exchange rate between the two currencies conforms eventually to purchasing power parity.

An index of exchange rate provides/indicates the mean rate of the country's currency with respect to the currencies of trade partners, weighted in terms of trade flows. The index for a country is obtained by finding the weighted average of bilateral exchange rates of the country under study and its major trade partners. It indicates the extent by which purchasing power of a currency has changed over the period/in the current year, with respect to that of the base year. If exchange rate variations compensated exactly the differential of inflation rates, the index would remain unchanged at 100. If an exchange rate becomes stronger than what is justified by the rate of inflation (i.e., the index becomes higher than 100), the exchange rate is considered as overvalued from the point of view of competitiveness.

Conversely, if the index is less than 100, it is regarded undervalued from the point of view of competitiveness.

The **THEORY OF INTEREST RATE PARITY**, states that premium or discount of one currency against another should reflect the interest differential between the two currencies. In a perfect market situation and where there is no restriction on the flow of money, one should be able to gain the same real value on one's monetary assets irrespective of the country where they are held.

The theory of interest rate parity is a very useful reference for explaining the differential between the spot and future exchange rate, and international movement of capital.

Deficit, in BOP increases the demand of foreign exchange. Surplus increases the value of national currency on the exchange market.

The following methods are employed for the forecasting exchange rates.

- 1) Method of advanced indicators
- 2) Use of forward rate as a predictor of the future spot rate.

13.Method of Advanced Indicators

Several indicators are used for prediction of exchange rates. One important indicator widely used is to determine the ratio of country's reserves to its imports. The reserves consist of gold, foreign currencies and SDRs.

14.User of Forward Rate as Predictor of Future Spot Rate

Some authors believe in the efficiency of markets and consider that forward rates are likely to be an unbiased predictor of the future spot rate. In other words, the rate of premium or discount should be an unbiased predictor of the rate of appreciation or depreciation of a currency.

Economic approach takes into consideration, Structure of the balance of payments, Examination of reserves in gold or in foreign exchange, Comparative study of inflation rates, and Study of activity and employment level, to forecast the exchange rate in the long run.

15.Risks in International Operations

Exchange Rate Risk Assessment And Internal Techniques of Hedging

Exchange rate risk (ERR) is inherent in the businesses of all multinational enterprises as they are to make or receive payments in foreign currencies. This risk means eventual losses incurred by these enterprises due to adverse movements of exchange rates between the dates of contract and payment. However, ERR does not imply that it will result into losses only. Gains may also accrue if the movement of rates is favorable.

In view of the substantial and significant stake in foreign countries, foreign exchange risk has become an integral part of the management activities of any multinational enterprise. Therefore, the management must be aware of the various techniques of dealing with ERR. Covering the foreign exchange risk is also known as hedging the risk. If a company in its wisdom does not want to hedge, it tantamount to have the view that the future movements of exchange rates will be in its favor. On the contrary, the conservative enterprises may adopt the policy of hedging everything.

Hedging obviously means a certain cost to an enterprise. Suppose the company hedges the exposure and the forward rates move in favor of the company due to a shift in economic factors between the dates of invoice and conversion of currency, the company would suffer or lose on this account.

Covering of exchange rate risk consists in modifying the company's exchange position in the exposed currency (ies). Recourse to covering or hedging techniques means a certain cost to the enterprise, which should define its strategy in this domain and try to foresee exchange rate fluctuations.

There are two types of techniques to cover exchange rate risk: internal techniques, adopted by the enterprise to limit the exchange risk, and external techniques that require a recourse to forward market, money market and external organizations. While this chapter discusses the internal techniques, the next one deals with the external techniques.

Multinational enterprises are subject to the following three types of risks/exposures:

- Transaction Exposure
- Consolidation Exposure.

16. Transaction Exposure

Whenever there is a commitment to pay foreign currency or possibility to receive foreign currency at a future date, any movement in the exchange rate will affect the domestic value of the transaction.

17. Consolidation (or translation) Exposure

This results from direct (joint ventures) or indirect investments (portfolio participation) in foreign countries. When balance sheets are consolidated, the value of assets expressed in the national currency varies as a function of the variation of the currency of the country where investment was made. If, at the time of consolidation, the exchange rate is different from what it was at the time of investment, there would be a difference of consolidation. The accounting practices in this regard vary from country to country and even within a country from company to company.

18. Internal Techniques Of Hedging

There are several techniques which can be used in this category to reduce the exchange rate risk:

- Choosing a particular currency for invoice
- Leads and lags
- Indexation clauses in contracts
- Netting
- Shifting the manufacturing base
- Centre of re-invoicing
- Swaps

19. Choice of the Currency of Invoicing

In order to avoid the exchange rate risk, many companies try to invoice their exports in the national currency and try to pay their suppliers in the national currency as well. This way an exporter knows exactly how much he is going to receive and how much he is to pay, as an importer.

This method is a noble one. However, an enterprise suffers under this method if the national currency appreciates; this is likely to result into a loss of market for the products of the company if there are other competitors.

Companies may also have recourse to invoicing in a currency whose fluctuations are less erratic than those of the national currency. For example, in the countries of the European Union, the use of European Currency Unit (ECU) is gaining popularity.

20. Leads and Lags

This technique consists of accelerating or delaying receipt or payment in foreign exchange as warranted by the position/expected position of the exchange rate. The principle involved is rather simple:

If depreciation of national currency is apprehended, importing enterprises like to clear their dues expeditiously in foreign currencies; exporting enterprises prefer to delay the receipt from their debtors abroad. These actions, however, if generalized all over the country, may weaken the national currency. Therefore, certain countries like France regulate the credits accorded to foreign buyers to avoid market disequilibrium.

The converse will hold true if an appreciation of national currency is anticipated; importing enterprises delay their payments to foreigners while the exporting ones will attempt to get paid at the earliest. These actions may have a snowballing effect on national currency appreciating further.

21. Indexation Clauses in Contracts

For protecting against the exchange rate risk, sometimes, several clauses of indexation are included by exporters or importers.

A contract may contain a clause whereby prices are adjusted in such a manner that fluctuations of exchange rate are absorbed without any visible impact. If the currency of the exporting country appreciates, the price of exports is increased to the same extent or vice-versa. Therefore, the exporter receives almost the same amount in local currency. Thus, exchange rate risk is borne by the foreign buyer.

A variant of the above is the indexation of price to a third currency or to a basket of currencies like ECU or SDR. This clause has repercussion for both the parties to the contract.

Another variant of indexation may be that the contract incorporates a clause stipulating that an appreciation or depreciation would be taken into account only beyond a certain level, say higher than 4 or 5 per cent.

There is another possibility where the contracting parties may decide to share the risk. They may stipulate that part of exchange rate variation, intervening between the date of

contract and payment, will be shared by the two in accordance with a certain formula, for example, half-half or one-third, two-third, etc.

22. Netting (Internal Compensation)

An enterprise may reduce its exchange risk by making and receiving payments in the same currency. Exposure position in that case is simply on the net balance. Hence an enterprise should try to limit the number of invoicing currencies. The choice of currency alone is not sufficient. Equally important is that the dates of settlement should match.

23. Bilateral

Netting may be bilateral or multilateral. It is bilateral when two companies have trade relations and do buying and selling reciprocally. For example, a parent company sells semi-finished products to its foreign subsidiary and then repurchases the finished product from the latter.

24. Multilateral

Netting can equally be multilateral. This is taken recourse to when internal transactions are numerous. Volume of transactions will be reduced because each company of the group will pay or be paid only net amount of its debit or credit.

In the case of manufacturing companies, switching the base of manufacture may be useful so that costs and revenues are in the same currency.

A re-invoicing centre of a multinational group does billing in respective national currencies of subsidiary companies and receives the invoices made in foreign currency from each one of them. It would be preferable, if possible, to locate the re-invoicing centre in a country where exchange regulations are least constraining.

The centre itself is a subsidiary of the parent company. The principle is simple: the invoices in foreign currencies are made in the name of the re-invoicing centre by the subsidiaries. And, the centre, in turn, will send out equivalent sums in national currency. Likewise, payments in foreign currencies to suppliers are made by the centre and it receives equivalent sums in the national currencies from the subsidiaries concerned.

25. Swaps in Foreign Currencies

Swap is an agreement reached between two parties which exchange a predetermined sum of foreign currencies with a condition to surrender that sum on a predecided date. It always involves two simultaneous operations: one spot and the other on a future date.

There are various types of swaps such as cross-credit swaps, back-to-back credit swaps, and export swaps, etc.

26. Cross-Credit Swaps

In this kind of swap, there is an exchange of foreign currencies between a parent company and, say, a bank in a foreign country. Let us say an American parent company wishing to finance its subsidiary in India may enter into an agreement with an Indian bank. The American parent company will deposit a sum in US dollars with the Indian bank, equivalent to the sum that it wants to lend in Indian rupees to the subsidiary, for a fixed period. Suppose this sum is US \$ 1 million at a 10 per cent rate of interest. The Indian bank will lend to the subsidiary a sum of Indian Rs.32 million (assuming the exchange rate is Indian Rs.32 = US \$ 1), say, at 12 per cent p.a. rate of interest. If the period of the swap is one year, then at the end of the swap period, the American parent company will receive from the Indian bank a sum of US \$1.1 million ($= 1 + 1 \times 0.1$) while the bank will receive from the subsidiary a sum of Indian Rs.35.84 million [$= 32 \times (1 + 0.12)$]. This swap operation is shown as

American Parent Co.,	US dollar loan	Indian Bank	Indian rupee loan	Subsidiary A...
	Reimbursement In US dollars		Reimbursement in Indian rupees	

Suppose, in the meantime, the exchange rate has evolved to Indian Rs 35/ US\$ 1, then the loss to the bank would be \$ 0.076 million ($= 35.84/35 - 1.1$). Thus, the exchange management risk got shifted to the Indian bank while both the American parent company and the Indian subsidiary were dealing in their respective currencies, without any uncertainty about the sums to be received or paid. The bank would have made a gain in case the exchange rate had evolved in the opposite direction.

27. Back-to-Back Credit Swaps

In a back-to-back credit swap, two companies located in two different countries may agree to exchange loans in their respective currencies for a fixed period. For example, KODAK (An American multinational) may lend in US dollars to the USA based subsidiary of FUJI while the latter (a Japanese multinational) may lend in Japanese yen to the Japan-based subsidiary of KODAK. Figure of swap operation.



The cost of swaps will depend on the rate of interest and the exchange rate chosen by the two parties.

An exporter may, agree to give discount for early payment. This discount represents a cost for the exporter. But by doing so, he avoids the exchange rate risk, diminishes credit risk and receives immediate cash.

28. Hedging Transactions Exposure

Basically, the strategy involves increasing hard currency (likely to appreciate) assets and decreasing soft currency (likely to depreciate) assets, while simultaneously decreasing hard currency liabilities and increasing soft currency liabilities. For example, if depreciation is likely to take place, the basic hedging strategy would be as follows: reduce the level of cash, decrease accounts receivable by tightening credit terms, increase local currency borrowing, delay accounts payable, and sell the weak currency forward.

<i>If depreciation is anticipated</i>	<i>If appreciation is anticipated</i>
<ul style="list-style-type: none"> • Sell local currency (LC) forward • Reduce levels of local currency cash and marketable securities • Reduce local currency receivables • Delay collection of hard currency receivables • Accelerate imports of hard currency goods before depreciation of local currency • Borrow locally • Delay payments of local accounts payable • Speed up remittance of dividend to the parent company • Speed up payments of intersubsidiary accounts payable • Delay collection of intersubsidiary accounts receivable 	<ul style="list-style-type: none"> • Buy local currency forward • Increase levels of local currency cash and marketable securities • Relax local currency credit terms • Speed up collection of soft currency receivables • Reduce imports of soft currency goods • Reduce local borrowing • Speed up payment of account payable • Delay remittance of dividend to the parent company • Delay payments of intersubsidiary accounts payable • Speed up collection of intersubsidiary accounts receivable

The major techniques External techniques for covering exchange rate risk

- Covering risk in the forward market;
- Covering in the money market;
- Advances in foreign currency;
- Covering in financial futures market;
- Covering in the options market;
- Covering through currency swaps;
- Recourse to specialized organizations.

Separate group exercises will be given regarding using of some of these techniques.

29. Covering a Consolidation Exposure

The magnitude of exposure depends on the method of translation used by the parent company.

Suppose an American company wants to borrow Deutschmarks at a variable rate. The company is well placed on the American market. It borrows US\$ 1 million on the American market at a fixed rate and enters into a swap deal with its bank. On the date of the contract, there is an exchange of the principal: the American company pays to its bank 1 million dollars and receives 1.4 million Deutschmarks, the spot rate being DM 1.4/US\$, during the contract period, the company will pay a variable rate on the Deutschmarks while the bank will pay it a fixed rate on dollars. There will also be a re-exchange of the principal on the maturity date.

American Company	\$ 1m	Bank
	DM 1.4 m	
American Company	Variable rate	Bank
	Fixed rate	
American Company	DM 1.4 m	Bank
	\$ 1m	

Currency swaps are comparable to a forward exchange transaction with a difference that the differential of rates is calculated periodically instead of being settled just once at the end of the contract; this feature renders the swaps more efficient and more flexible than covering in the forward market for long periods.

30. Interest Rate Risk

All banks and firms, domestic or multinational are sensitive to interest rate movements. The interest rate risk results from a mismatch of maturity of assets and liabilities respectively.

Financial markets have developed instruments, options and futures, on interest to cover these risks. Likewise, banks have also evolved/devised certain mechanisms in this regard.

Interest rate risk concerns the following:

- Present credits and debts;
- Future credits and debts; and
- Conditional credits and debts.

An interest rate position either on the asset side or on the liability side is subjected to fluctuations of rates. An enterprise, a bank or an investor is said to have a “long position” in the case of increase in the rate of interest. Conversely, these operators are said to have a “short position” in the event of decrease in the interest rate.

When an enterprise is faced with a situation of interest rate risk, it can:

- Either decide to do nothing and keep its position uncovered;
- Or cover itself by taking recourse to organized markets of interest rate options and futures;
- Or cover itself on over-the-counter (OTC) markets, future rate agreements, forward-forward agreements interest rate options, caps, floors, swaps, etc.

There is a close nexus between IRR and prices of financial securities. Therefore it would be useful to know, how the prices of financial securities vary. The price of a financial security is equal to the present value of cash inflows that it generates during its life. In general, the price of a fixed rate financial security refundable at the end of the borrowing period depends upon:

- ***The coupon amount.*** Coupon is equal to the product of nominal value of a bond and interest rate;
- ***The mode of capital refund.*** Normally, refund is done in one lot at the end of the life of a bond, but it can be done in installments over a period of a number of years;
- Market interest rate;
- Maturity period of the borrowing.

When market interest rate increases, the price of the fixed-income security decreases and conversely when market interest rate decreases, the price of the fixed-income security increases.

31. Balance Sheet Risk (or Capital Risk)

Balance sheet risk is the consequence of an interest variation, which diminishes the value of certain assets or increases the value of debts. For example, if an Indian company has brought American fixed-rate treasury bonds and if the bond coupon rate in America increases, in that case the value of American bonds in the balance sheet will decrease.

When market interest rate (or yield) increases, there is an arbitrage operation which lowers the prices of bonds until their yield becomes equal to the prevailing rate in the market. If the investor is then constrained to liquidate his bonds, he suffers a capital loss.

On the other hand, a decrease in market yield induces a price increase that results into capital gain if the investor liquidates his bonds. However, if the bond is held till its maturity, there is no risk resulting from market variations.

32. Income Statement Risk (or Revenue Risk)

This risk is observed when interest rate fluctuation decreases profits either by increasing financial charges or by reducing financial income. For example, if an Indian company has borrowed US dollars at the floating rate of interest and wants to renew the debt, the interest charge will increase since the new rate would normally be higher. Financial charges appearing in the income statement would increase. Similarly, another company that wants to borrow French francs after six months fears an increase in French rates; it would suffer a loss of opportunity by not borrowing now.

The enterprise that issues fixed-income bonds pays interest which is not affected by changes in market conditions. If interest rates decrease subsequent to the bond issue, the issuer suffers a loss vis-à-vis its competitors.

The situation is identical for an investor who has bought fixed income bonds. If the rate goes up, once the purchase has been done, the investor suffers a loss in comparison to those investors who had waited for rate increase. On the other hand, if the rates decrease, subsequent to the purchase, the investor makes a gain in his income vis-à-vis other operators who did not buy the security at the opportune moment.

Interest rate risk is measured by sensitivity and duration.

The value of sensitivity depends upon several factors:

- Life of the security;
- Interest rate on the security;
- Market interest rate.

Bond prices vary in opposite direction to that of interest rate variation. When two bonds differ only in terms of their interest rates, the one having the lower coupon will vary more for the same variation of market interest rate.

When two bonds differ only in terms of their maturity, the one having the longer maturity will vary more for the same variation of the market interest rate.

For every bond, a given increase in the interest rate results into a smaller variation of price than an identical decrease in the interest rate.

For a given percentage increase or decrease of interest rate, and everything else being the same, price variation is higher for the security with the lower coupon.

In general, the sensitivity of a fixed-income bond is greater if coupon rate is smaller and its residual period is longer.

Duration is an index of time during which an investor recovers his funds initially invested. Duration is calculated by finding the ratio of (i) sum of the product of period and the corresponding present value of cash flows generated by the security, and (ii) present value of the security. It is expressed in terms of years. It enables to compare bonds issued with different conditions.

The securities with longer duration have greater volatility than those of shorter duration. Thus, the higher duration implies greater risk.

If the duration of the asset is higher than that of liability, the financial firm is holding a long position and then the risk comes from the increase in rates, as decrease in the value of assets held will be higher than the advantage accruing from a decrease in sum payable. On the other hand, if the establishment holds a short position, i.e., the duration of the asset is smaller than that of liability, the risk emanates from a decrease in rates.

The traditional instrument used on financial market is fixed-coupon bond. This instrument has undergone several modifications to make it adaptable to the environment characterized by interest rate volatility. The first modification was to reduce maturity periods of bonds in order to diminish the degree of uncertainty for investors and borrowers in respect of the stability of interest rates.

The second modification was to issue bonds whose maturity could be prolonged or shortened so as to reduce the impact of interest rate variations. When the life of bonds is extended (coupon rate remaining the same) the investor does not suffer the loss of revenue in the event of general decrease in market rates of interest. Conversely, a borrower may re-schedule his debt without suffering from an increase of interest rates. Similarly, maturity may be shortened to avoid any loss from future fluctuations.

The third modification that appeared on the scene in 1970s, relates to bonds with variable rates. These bonds have their coupon indexed to a rate of reference. This rate is normally a variable rate plus a spread varying between 1/8 and 2 per cent. The bonds with variable rates have constituted an adequate response to variations in interest rates of large amplitude.

Still another modification aimed at changing rate and maturity simultaneously. This modality may permit constant revenue for a longer period in case of an anticipated decrease in rates.

An interest rate futures contract is a commitment to deliver (for the buyer of the contract) financial securities for a specific amount, on a predetermined future date.

There exist two types of future contracts:

- Short-term contracts which permit the enterprises to cover themselves against short-term interest rate risks;
- Long-term contracts permitting the enterprises to cover themselves against long-term risks.

Contract price reflects the anticipation of buyer and sellers regarding the interest rates. In order to properly understand the functioning of forward operations, it is desirable to look at the inverse relation between the prices of fixed-rate securities and the rates of interest.

The terms used in published information on futures contracts are: opening price of a session, settlement price or closing rate, change, highest rate, lowest rate, volume traded.

33. Basic Characteristics of Rate Futures.

Basis. The basis, in the context of the futures market, represents the difference between the forward rate and spot rate (i.e., spot rate on settlement date). The basis may be positive or negative during the contract period. However, on the maturity date, there is a convergence of the basis because forward rate on that date becomes same as the spot rate. If the duration of a deposit or a loan is not equal to the duration of the futures contract, the enterprise or the bank exposes itself to a basis risk.

Maturity date. These are four in number: March, June, September and December.

Guarantee deposits. Guarantee deposits are made with the clearing house of the exchange. The role of the clearing house is to ensure the solvability of operators. The guarantees are of the order of 2 to 4 per cent of the contract amount.

Everyday, during the life of the contract, gains or losses are calculated according to the rate movements. If the rate moves unfavorable for the operator, he is called upon to make supplementary payments (called margins). Conversely, he receives payment if the rates have moved in his favor. This process continues up to the date of the delivery, provided the contract is not already liquidated before that date.

34. Direct Costs of Operations.

The direct costs of these operations are represented by the commissions paid to brokers and are normally paid when positions are closed or delivery is made.

35. Covering risk in the market of interest rate futures

When a futures contract is brought or sold, the price is fixed but payment is made at a future date. The margin is paid either in cash or in the form of treasury bills to

demonstrate that the operator has money to honor his side of the bargain. As long as interest is earned on margined securities, there is no cost of margin deposits. The enterprises which are to take loans or place their cash on some future date may prefer to lock in the interest rate today itself to guard against unfavorable rate movements in the interim period.

When interest rates rise, the price of an interest rate future comes down. The risk of rise in interest rates is covered by selling futures contracts. The enterprise that wants to cover itself against rise of interest rates sells contracts for an amount and a duration equivalent to the position that it wants to cover. If a rise does take place, the gain that the enterprise would have by repurchasing at a lower price the contracts that it had sold compensates the loss resulting from the rise in the rate.

When interest rates fall, the price of an interest rate future increases. The risk of fall in interest rates is covered by buying futures contracts. The enterprise that wants to cover itself against fall of interest rates buys contracts for an amount and a duration equivalent to the position that it wants to cover. If a fall does take place, the gain that the enterprise would have by reselling at a higher price the contracts that it had bought earlier compensates the loss resulting from the fall of the rate.

36. Risk from Rise in Interest Rates.

This is the risk to which one exposed:

- 1) The enterprises which have taken a loan on a renewable rate or on a roll over basis;
- 2) The enterprises that have to borrow in future.

37. Advantages of Interest Rate Futures

Interest rate futures are an efficient means of reducing the risks of rates and also for obtaining better results. Interest rate futures are used to:

- Reduce the effect of rate variations on balance sheet items, for example, an enterprise that has borrowed at a fixed rate and wants to benefit from a fall in rates;
- Reduce the impact of rate fluctuations on anticipated positions; this, in turn ensures the business unit a more certain borrowing rate or a rate of return on its fixed income securities.
- Arbitrage between the future market and spot market.

In brief, future market provides a great deal of latitude and security to operators an important feature of this market.

Limitations of Interest Rate Futures

- Basis risk is incurred when the maturity date of borrowing or lending does not coincide with maturity date of a futures contract,
- Risk of correlation is incurred when the rate covered is not perfectly correlated with the rate of a futures contract;
- Risk of indivisibility is incurred when the number of contracts bought or sold does not perfectly correspond to the amount to be covered.

38. Covering interest rate risk in options market

Options on interest rate may be used:

- For covering against interest rate variations; in effect, purchase of a option enables the buyer to ensure that he would not have to pay more than a certain rate of interest on his borrowing, or would not receive less than a certain minimum rate on his lending;
- For speculations;
- For arbitrage operations.

39. Mechanism of Interest Rate Options

Purchase of a call option gives a right to the holder to buy a financial asset at a fixed price and purchase of a put option gives him a right to sell a financial asset at a fixed price, called exercise price, on payment of a premium to the seller of the option. Interest rate options have certain characteristics:

- Contracts are standardized from the viewpoints of amounts, maturity, and period (March, June, September, December) :
- Exercise prices are given at intervals of 0.25 dollar for Euro-dollar contracts, for example, 92.25, 92.50, 92.75 etc;
- Contracts are easily negotiable;
- The clearing house ensures the regularity of operations.

40. Purchase of a Put Option

A put option is also called a borrowing option. In order to cover against a rise in the interest rate, an operator (for example, an enterprise that has to borrow shortly by issuing bonds or a portfolio manager who has to shortly liquidate his bonds) purchases put options.

41. Purchase of a Call Option

A call option is used when one fears a fall in interest rates.

42. Instruments on over-the-counter (OTC) market

Several new instruments for covering interest rate risk have developed over the years on OTC market. These instruments enable the operators to cover fixed as well as variable rates.

43. Fixed-Rate Instruments on OTC

Forward-Forward Operation

This is an operation that enables an operator to fix immediately interest rates of a debt or a loan which will be contracted at a later date. For example, an enterprise wants to ascertain today the interest rate on debt which it will borrow after 3 months for 6 months. This can be done by:

- Borrowing for 9-months today;
- Lending for 3-months today.

These two sets of transactions will enable the operator to know in advance the effective rate of interest on 6-months borrowing, 3-months hence from today, as desired.

44. Forward Rate Agreement (FRA)

It is a kind of tailor-made futures contract. Unlike normal futures contracts which are standardized, a forward rate agreement is for a predecided maturity date, for a predecided amount, and at a predecided rate, as may be agreed between the borrower and lender.

The FRA may, *prima facie*, sound more attractive than futures. However, banks usually charge a higher rate if an enterprise wants to borrow odd amounts for odd periods. And, if the manager of the enterprise changes his mind and wants to sell his forward contract, he must negotiate afresh with the bank.

45. Interest Rate Options on the OTC Market

Options traded on the OTC market are generally similar to those traded on the organized market. However, there are certain redeeming features of the OTC market vis-à-vis the organized market. There is no financial asset in the case of an OTC option contract; there is only an interest rate.

- They are not standardized: the amount and maturity are negotiated;
- Exercise price is the one defined in the contract;
- Premium is expressed in terms of percentage of the amount under option.

Borrowing rate options. These options enable an enterprise to ensure a borrowing rate, while letting it have all the freedom to benefit from a favorable evolution of rates.

Lending rate options. A lending rate options enables an enterprise to place its cash at a certain minimum rate, while leaving it all freedom to benefit from a favorable movement of rates.

46. Variable Rate Instruments on OTC

Since interest rates fluctuate very widely and are thus very volatile, enterprises very often borrow or place money at variable rates. Therefore, banks also have put in place the instruments to cover variable rates.

47. Caps and Floors

These instruments are like interest rate options whose exercise takes place several times during the contract if the buyer of the instruments finds doing so to his advantage.

Cap. Purchase of a cap enables a borrower to fix in advance a maximal borrowing rate for a specified amount and for a specified duration, while allowing him to avail benefit of a fall in rates. Naturally, the buyer of a cap pays a premium to the seller.

The enterprise and the bank decide on a reference rate, a cap, a notional amount of operation, premium to be (expressed in terms of percentage) paid in advance, and the periodicity of eventual payments.

At every renewal, a comparison is made between the reference rate and the cap. If the reference rate is higher than the cap, the bank pays to the enterprise the difference of interest calculated on the notional amount. If the reference rate is lower than the cap, no payment is made.

Floor. Purchase of a floor enables a lender to fix in advance a minimal rate for placing a specified amount for a specified duration, while allowing him to avail benefit of a rise in rates. The buyer of the floor pays a premium to its seller.

A floor is some sort of a series of lending options, having the same characteristics.

Importance of caps and floors. They offer a guarantee of a maximal rate (for caps) and a minimal rate (for floors), while permitting to benefit from favorable rate movements.

The market of caps and floors is liquid for durations as long as 10 years for convertible currencies. A more frequent period is 5 years.

48. Collars.

Collars are a combination of caps and floors. The purchase of a collar enables its buyer to ensure a maximal borrowing rate (cap), while permitting him to benefit from any fall in rates up to the floor.

Since purchase of a cap and a sale of a floor occur simultaneously, the amount of premium to be paid is reduced. The rate guaranteed is within a certain range.

49. Swaps

An interest rate swap is a contract for exchange of rates between two companies on a notional capital. These can be affected either directly between two organizations or through a bank.

Swap through a bank. A bank comes between the two companies as a mediator since it may not be easy for the companies to find counter-party. This role is played by the bank which, of course, makes a gain in the bargain for the services rendered.

50. Political risk

Political risk can be broadly classified into the following three categories:

- Country risk;
- Sector risk;
- Project risk.

51. Country Risk

This risk emanates from political, social and economic instability of a country and manifests in the form of more or less strong hostility towards foreign investments. For example nationalization multinational enterprises. Control in certain sectors etc.

52. Sector Risk.

Certain sectors are prone to greater political risk than others in some countries, through general climate to foreign investment is not unfavorable. Included in this category is petroleum, mining, banking and so on.

53. Project Risk

Sometimes, only a project is subject to risk

Measures Taken for Salvaging Adverse BOP in the form of Restrictions on outgoing capital, Restrictions on imports and Measures Aiming at a Certain Degree of Control on Foreign Investments will act as constraints on international business.

54. Political Risk Management

Risk management by a multinational enterprise is required at three stages:

- Before an investment is made in a foreign country;
- During the life of the investment, once made;
- While negotiating for indemnity (compensation) in case there has been an attack on the investment through nationalization, etc.,

55. Management of Political Risk before the Investment

In view of significant bearing of political risk on the success of international project(s), it is imperative that the investor assesses the nature and extent of political risk.

While studying investment risk in foreign countries, it has been observed that the following approaches are adopted:

Dichotomy decisions. To invest or not to invest aboard (go-no-go approach). Some countries are considered rightly or wrongly to be risky *a priori*, and a firm would not invest there.

Assigning a risk premium. Since risk is difficult to quantify, it is necessary to be taken into account. Therefore, there is a practice relatively widespread in multinational enterprises to assign risk premium to foreign investments.

Sensitivity analysis. This analysis brings to fore the major factors influencing cash flows (inflows as well as outflows) of the project.

In order to avoid litigation, to the maximum extent possible, as well as to safeguard their interest, investing companies try to incorporate a number of points in contracts (as far as possible favourable to them) regarding conditions concerning access to local capital market, taxation applicable to the company, right to import raw material and semi-finished products, and right to export to other foreign countries, right of capital transfer, interest, dividends, rents, conditions of local participation, insurance and guarantees.

Besides, multinational enterprise should try to ascertain if there are any bilateral agreements or conventions for protecting investments between the country of the parent company and the host country. These conventions carry very useful clauses for the investor, for instance, commitment of the state to pay compensation in the case of nationalization, guarantee of transfer, recourse to an impartial arbitrator in the case of

dispute. However, it may be noted that these bilateral conventions only diminish political risk but do not eliminate it completely.

56. Management of Political Risk during Life of the Investment

If the enterprise anticipates an aggravation of the risk, it should try to adapt to this risk and integrate it into its decision process. It may adopt the following approaches for the purpose:

- Not to localize the whole of production process in the same country;
- To integrate local products;
- To have recourse to debt;
- Plough back the funds generated by the subsidiary rather than bringing new capital from the parent company;
- To increase the number of local employees;
- To have other local alternative sources of supplies;
- To establish a joint venture with a local enterprise.

These measures may reduce the flexibility of the company; this may be considered, in a way, the cost to be paid to meet political risk.

Alternatively, a company may have recourse to external guarantees to protect itself. There exist in many countries public and private insurances to cover these risks.

57. Management of Political Risk after Nationalization

Nationalization of a foreign subsidiary causes the following problems:

- Determination of the amount of compensation;
- Modalities of payment of indemnities;
- Proceedings before courts or International Centre for Settlement of Investment Disputes (ICID), the institution created in 1966, which is a part of the World Bank.

58. Foreign investment: theories

Investments in a foreign country are motivated by a number of considerations – economic, financial, behavioral, strategic, and so on.

The process of foreign investment is slower, more costly and more complicated than that of domestic investment as it entails additional risks in terms of political risk and exchange risk.

The theory of Comparative Advantages theory provides *raison d'être* better in respect of international trade than foreign direct investments. The theory stipulates that each

exporting country should specialize in the production of only those products in which it has a comparative cost advantage. This theory was based on the hypothesis of immobility of factors of production as opposed to the mobility of products.

According to the theories based on market structure, firms which invest abroad must have a comparative advantage in terms of one or more of the following factors:

- Cost of capital
- Economics of scale
- Infrastructure for research and development
- Funds for advertisement, etc.

These advantages should be sufficiently significant to offset the costs of setting up a company in a foreign country.

The Theory of Product Cycle shows that the choosing by the firm between exporting, producing abroad and license agreement depends on the stage of the product cycle. The product cycle has three phases:

- 1) The product develops in the country of origin where the firm has a comparative technological advantage. The firm may have a complete monopoly in its exports without facing any competition from others. The product is not yet technologically standardized.
- 2) The technology of production settles down and the product attains maturity. At this point, foreign competitors may appear on the scene. In order to maintain its advantage, the firm may shift its location of production to countries where it can obtain lower costs of production.
- 3) The firm may start producing either in the country where it was previously exporting or in a less developed country to take advantage of lower labor costs with a view to exporting from there to the rest of the world.

59. Hymer's Theory of Imperfect Markets.

S.Hymer, a Canadian economist developed this theory in 1960. First, he presented a critique of neo-classical theory; according to the theory capital moves from countries where it is abundant or where interest rates are low to countries where it is scarce or where interest rates are high. In fact, the neo-classical theory could, to a great extent, explain the American foreign investments in postwar years. However, it fails to explain crossed investments in continents/countries like USA-Europe, Europe-Japan, Japan-USA. Besides, multinational companies often borrow in financial markets of host countries to finance their investment in that country and sometimes even to finance a part of their

domestic operations. The fund raising activities on the part of multinational enterprises just go contrary to the basic philosophy of neo-classical theory.

Hymer bases his theory on the structure of oligopolies in that oligopolistic enterprises are in a position to fix a high price as they deal with a large mass of unorganized buyers.

In order to set up its operations abroad, a multinational should have a comparative technological or organizational advantage over its competitors in the host country. These advantages will translate in terms of lower costs and more efficient use of its resources.

Hymer distinguishes between the economies of scale obtained at the level of the firm and the economies of scale obtained at the level of the sector. The first are a result of the organization of the firm while the latter result from the division of labor.

The economies of scale at the level of a firm can be seen in production, marketing, finance, research and development, human resources, etc.

60. Managerial Approach

Several authors place a special emphasis on the role played by managers of big groups. They think that the growth of the firm emanates from exploitation of new products to winning new external markets.

The decision to invest abroad is a response to an opportunity that comes either from an internal stimulus or from an external stimulus. The internal stimulus is the decision of the management to set up a subsidiary abroad. The external stimulus may be the fear of losing a market on account of foreign competition.

Regarding direct foreign investments Prof. J.Dunning listed these factors in three major categories known as: OLI paradigm (Ownership, Location and Internal advantage paradigm) more popularly referred to as eclectic theory. According to him, direct investment is chosen when an enterprise has three kinds of advantages, i.e., Ownership advantage, Locational advantage, and Internalization advantage.

In order that a company is a potential exporter, following conditions are to be fulfilled.

- The price of the product should be lower than that of other foreign competitors;
- The quality of the product should be better and adapted to the needs of foreign customers;
- An export service should be organized.

After an analysis and selection of markets, the enterprise determines its export policy and arranges necessary means for putting that policy in application. There are several options available for exporters in this regard.

- Direct sales to industrial buyers, to distributing agents, or to wholesalers;

- Sales through legal agents on payment of commission;
- Recourse to international trading companies. These are very well developed in some countries.
- Multinational firms may also consider exploring the possibility of seeking assistance of well established companies on foreign markets for sales network.

Through a license agreement, a firm confers right to a foreign company to manufacture its products. This right may be exclusive or non-exclusive. It may relate to patents, brands or models, a technological process, copyrights, etc. In exchange for this right, the firm receives a financial compensation.

A license agreement provides to a firm the possibility of obtaining incremental revenue by allowing its products to be manufactured abroad. This is particularly true when the firm on its own cannot produce abroad due to lack of necessary capital.

A License agreement is particularly very useful in a case where a firm is not in a position to invest directly in a country in view of trade or other restrictions.

61. Franchise agreements

A franchise contract means that a company owning rights on brands, etc. places at the disposal of another company:

- Technical or commercial know-how;
- A line of products or services to be sold according to the same marketing techniques, as already experimented by the franchisor.

The franchise agreements, first developed on national levels, have subsequently developed beyond the national frontiers.

A franchise agreement requires contribution on the part of two contracting parties, the franchisor and franchisee. The franchisee brings in his means, namely capital, sale points, etc. He ensures the management. He commits himself to respect the marketing norms and management norms of the franchisor. He pays an entry fee and a periodic rent, calculated on the basis of turnover.

62. International management contracts

By a management contract, a firm helps another firm to accomplish general or specialized management tasks during a certain period in consideration of payment. These contracts are often demanded by the government of a country that has expropriated an enterprise but wants to maintain technical service.

Such contracts may facilitate the company furnishing technical assistance an access to some raw materials.

63. Turnkey projects

A turnkey project contract stipulates setting up or construction of a factory which will be transferred to its owner as soon as it starts functioning effectively.

Payment for these operations is spread over a period of time, and is linked to the progress of the work.

64. Specific contracts

Some companies, in view of their technical competence, are invited to operate in foreign countries. The domains can be as varied as hydrocarbon exploration, public works, construction of roads etc.,

Contracts for technological cooperation and mutual benefit may be signed for a specified period between two or several companies for exchange of information on their respective research activities.

65. Joint Ventures

A joint venture is a collaboration of two or more enterprises (legal or physical entities) to achieve a common goal (say profit sharing in business or services). In international context, one of the parties is generally from the host country. The parties agree to contribute to the capital and share profits as per pre-decided ratios.

66. Mergers and Acquisitions

The growth process in international business can be facilitated by acquisitions of existing businesses and/or merging with them.

Mergers and acquisitions are often carried through a public tender for purchase or for exchange. This is a financial technique that allows restructuring of enterprises either in a friendly manner or in a hostile manner. The price is settled either in cash (purchase) or in form of shares (exchange). When a public tender for purchase or exchange is offered without the accord of the company management, it is called a hostile offer.

Strategies of Defense against Takeover Bids are

Regulatory, financial and legal.

67. Activities of venture capital

Venture capital represents a mode of financing, particularly adapted to development of enterprises in sectors of high technology. Venture capital is a particular form of financing that combines:

- Making available necessary equity capital; and
- Assisting in management.

Equity capital may be brought in the form of participation in the capital or subscription to convertible bonds. The funds may equally be brought in as loans, bonds or bonds-with-warrants.

Creation of a company with venture capital may constitute, for big groups, a means of access to advanced technologies. Normally, participation in venture capital is not meant to last long. As soon as the enterprise is able to develop using its own means, it is resold. As the growth of the enterprise so financed blocks all disposable funds for the period of participation, the investors receive neither interest nor dividend. Returns on placement depend on the capital gain at the time of the sale.

68. Foreign capital budgeting decisions

Capital budgeting decisions relating to project investment abroad require data pertaining to their incremental investment outlays, operating costs and benefits which can be conveniently, wholly and exclusively identified with proposed investment. It is very significant to draw a distinction between total and incremental cash flows. In other words, the data which do not affect the present decision either in terms of investment outlays, revenue costs or benefits are irrelevant. For instance, the cost of land which is lying vacant in factory premises of a 'subsidiary' and is not being let out as a policy decision, would not constitute a relevant capital/investment cost for setting up a new plant to produce a new product. Likewise, the existing overheads (either of parent or of subsidiary multinational corporation, MNC), if allocated, are to be excluded.

In effect, the cost to be relevant must be incremental in nature and so must be the benefits and revenues accruing from the proposed decision. If the new product, in some way, adversely affects the existing levels of sales of other product(s) of the firm, the profit contribution foregone from such lost sales also constitutes relevant data. For instance, if a MNC builds up a new plant overseas in a country, to which it was hitherto exporting, total sales/income of the subsidiary are not relevant; only incremental sales/income are relevant as there is substitution of foreign production for parent company exports. Therefore, budgeted profits from the new project must be scaled down by the earnings on the lost sales.

In the event of increase in sales of other products of the parent company as a result of setting up a new plant abroad (acquired strong local market position in several product lines), profit earned on increased sales should be taken into account in estimating

project's profitability. The reason is obvious – but for the investment abroad, additional sales would not have been possible. 'Synergy' effect accordingly, should be reckoned.

Besides, care should be taken to include the true economic cost (i.e. opportunity cost) of any resource required for the project, irrespective of the fact whether the firm owns the resource or is to buy it from outside. For instance, rent foregone due to the use of factory/office space (now to be used in the proposed investment project) is the relevant cost.

It is often customary to charge investment projects with various items such as legal counsel, technical know-how, management costs, research and development, training of personnel, and so on. While these are costs from the point of view of project, they are benefits (received in the form of fees and royalties) to the parent. *Prima facie*, they net out each other and therefore, warrant exclusion. However, if such costs/overheads (or some of them) are additional on account of the project, they form part of relevant cost data. Clearly, the list of costs and benefits which 'should be' and which 'should not be' taken into account cannot be exhaustive; it may vary from one MNC to another in the industry and may vary within the same MNC over a period of time. In carrying out an 'incremental analysis' exercise, the guideline is: but for the investment proposal under consideration, these costs and benefits would not have taken place.

Both costs and benefits should be measured on a cash flow basis and not on the basis of accounting profits. That cash flow approach is more useful and scientific as a decision criterion than accounting profit approach, is well recognized in the literature of financial management. The other reason under-lying superiority of cash flow approach are: (i) it avoids the ambiguities of the accounting profit concept, (ii) it takes cognizance of the time value of money. Above all, since investment analysis is concerned with finding out whether future economic inflows are sufficiently large to warrant the initial investment, only the cash flow method is appropriate for investment decision analysis.

In sum, it can be said that expected/projected incremental cash flows after taxes arising out of the investment decision (of setting up a subsidiary abroad, expansion/diversification of existing subsidiary) constitute the relevant data for its evaluation.

While it is true that the principle of incremental analysis is very simple in terms of conceptual framework, its practical appreciation is not without problems. For instance, it is very difficult to estimate the magnitude of lost sales/accretion of sales on account of the proposed project. However, it does not undermine the utility of 'incremental exercise'; it only cautions the executives responsible for such decisions.

69. Evaluation of a project

Like domestic capital budgeting decisions, the objective of foreign capital budgeting decisions by MNCs is maximization of the wealth of its shareholders. The technique of net present value (*NPV*) is considered most appropriate in this regard as it is consistent with the objective of financial decision to maximize the shareholders' wealth.

Like domestic capital budgeting decisions, foreign investment decisions require to be evaluated on the basis of their cash flow requirements (in order to carry out them) and their cash flow (CFAT) generating capacity in the future years.

Assuming that the subsidiary is an independent company and calculations are to be performed in the local currency where the subsidiary is located, determination of cash outflows as well as cash inflows related to the project is a simple exercise. In fact, it is similar to domestic investment decisions.

When foreign investment decisions are to be evaluated from the perspective of parent (in the currency of parent MNC), the analysis should be based on the cash flows expected to be remitted to the parent and not on the basis of CFAT generated by the project. In practice, more often than not, there exists a difference between the two sets of cash flows. This difference arises primarily due to tax regulations, exchange controls, inflation and currency fluctuations. Besides, it is often customary to charge fees for technology transfer, management/supervisory fees and royalties from the subsidiary unit. Though they are treated as project expenses by the subsidiary, they in fact constitute returns (cash inflows) to the parent MNC.

70. Effect of Taxes

First, the local government of the country (where a subsidiary is located) taxes profits. In most of the countries, there are specific provisions for taxing the profits earned by subsidiaries of foreign companies. As per the tax laws of the country, a subsidiary pays corporate taxes. If tax concessions are granted to encourage foreign investments, foreign subsidiaries in such situations, may be subject to lower tax rates.

Second, apart from corporate taxes, it is not uncommon for local governments to impose withholding taxes on that part of profits which is remitted in the form of dividends to the parent. These withholding taxes can sometimes be avoided if the company repatriates profits in the form of loan repayment and not in the form of dividend payments.

Third, some governments (to avoid double taxation) allow tax credits (partial or total) for foreign income taxes and for withholding taxes paid. Again, in this respect, tax laws vary from country to country. It is useful to note in this regard that many nations also operate on the basis of special tax treaties which further adjust the amounts that may be paid or withheld in those countries.

Finally, legislation (particularly in developing countries) often requires that a part of the profits be retained (as a matter of policy to achieve certain goals, say, to help in making more funds available for development).

When there are restrictions (not uncommon in developing countries) on the repatriation of income, only remittable cash flows are relevant from the parent's perspective.

Thus, restriction on the movement of funds of the subsidiary's profits may entail severe adverse impact on the profitability/acceptability of foreign direct investment.

Exchange rate risk is yet another significant variable to be considered in assessing foreign direct investment. This risk is very much there while undertaking investments in underdeveloped countries. As a result, repatriable cash flows (converted into the currency of the parent) diminish on account of periodic devaluation of local currency. Exchange rate changes are normally preceded by relatively higher or lower local rates of inflation than in the home country.

71. Effects of inflation may vary from firm to firm.

Besides operating profits and cash flows, inflation is also likely to have an impact on working capital requirements of corporate firms; these are likely to go up in view of increased input costs (say material, labor, power and so on) on the one hand and increase in required cash balances, and investments in debtors on the other.

Multinational firms will like to invest in countries with stable currencies, stable governments, sound economic health, stable economic policies and the least political risks (in terms of expropriation).

72. Cost of capital and financial structure

The unifying theme guiding management in financial decisions is maximization of shareholders' wealth in the long run.

The cost of capital has been used as the discount rate/minimum required rate of return to determine the net present value of the proposed international investment.

Sound capital structure apart, the determination of correct weighted average cost of capital is also important to evaluate capital budgeting decisions. In fact, it constitutes an integral part of investment decisions. In operational terms, it is the minimum required rate of return expected to be earned by the proposed investment.

Therefore, the correct determination/estimation of the cost of capital is of vital significance to a corporate firm and so of optimal capital/financial structure (as it yields the lowest cost of capital).

73. General principles

First, it is assumed that it is possible to forecast cash flows (associated with financing decisions) with a sufficient degree of precision and accuracy in order to be useful in future.

Second, apart from forecasting the likely exchange rate (spot as well as future), a time interval for forecasting cash flows needs to be chosen.

Third, a convenient unit of account should be chosen. This may be the unit of currency in which returns from the project are measured. Both the returns and cost of funds should be expressed in the same currency.

Fourth, the MNC should take into account the likelihood of changes in constraints, such as borrowing restrictions, tariff and exchange controls, limitations on cash transfers and other remittances, taxes and so on. Given the objective of the management to borrow at the lowest possible effective rate, the finance managers of international firms should explore the possibilities of raising funds in various financial markets/currencies.

Fifth, in the event of the firm needing more funds than available through retained earnings, it is to raise funds from external sources (say, debt, preference shares and equity). The cost of each of these three sources varies. In general, debt is regarded the cheapest source of finance as interest on debt is tax deductible.

As the debt ratio rises, debt holders rightly perceive higher debt/equity (D/E) ratio as more risky for their lendings.

For the same reason the credit rating firms may reduce its credit rating. From the equity shareholders' perspective as well, financial risk will also increase their required rate of return. Therefore, it is apparent that debt should be used only within safe limits.

Sixth, the entire advantage of a cheap source of finance, say debt (assuming to have been used within safe limits), should not go to one project only which happens to be financed from that source. Likewise, one single project only which not be burdened with the costly source of finance, say equity. Issuing equity 'now' implies potential of raising debt in future years; issue of debt 'today' implies the virtual necessity to go for equity in future years. Therefore, it is only appropriate and logical, that the firm should use weighted average cost of these sources as a discount rate for investment decisions.

The cost of capital of multinational enterprises (like domestic corporate firms) is ideally based on weighted average cost of long-term sources of finance. Its overall determination, therefore, requires separate computations of each major long-term source of finance, namely, long-term debt, preference shares, equity and retained earnings.

Determination of cost of various sources of finance is simplified, to a marked extent, by adopting the Porterfield approach of explicit and implicit costs. According to Porterfield, "The explicit cost of any source of capital is the discount rate that equates the present value of the cash inflows that are incremental to the taking of the financing opportunity with the present value of its incremental cash outflows".

In the context of international finance, cash flows should be duly adjusted for taxes, foreign exchange risk, timing of repatriation and so on.

74. Local Debt

The computation of cost of debt is relatively easy particularly when borrowings by subsidiaries are from local banks, local financial institutions or from financial markets in the host country. Both the types of cash inflows and of outflows are amenable to accurate forecast and, therefore, the cost of local debt can be determined with a fair degree of precision.

75. Foreign Debt

More often than not, subsidiaries borrow from banks, financial institutions or financial markets in the country of the parent company or tap international financial markets. For the purpose of determining the effective cost of foreign debt in such a situation, the expected rate of variation in the value of foreign currency (in which borrowings are made) with reference to the currency of reference (known as base currency) should be taken into account.

76. Cost of preference shares

Computation of the cost of preference shares is similar to that of debt. Like debt holders who are entitled to a fixed rate of interest, preference shareholders are also paid a pre-specified rate of dividend (unless preference shares are participating; in general, most of these shares are non-participating). However, unlike interest payments on borrowings, dividends paid on preference shares are not tax-deductible. The reason is that dividend payment is appropriation out of earnings. In contrast, interest payment is a charge against profit. Since dividends are paid out of earnings (which obviously are after taxes), no adjustment is required for taxes while computing the cost of preference shares.

The cost of preference shares is based on the ratio of preferred dividend and the net proceeds received from the issue of preference shares.

77. Cost of equity capital

At the outset, it may be mentioned that the cost of equity capital is the most difficult cost to be computed. It is so because unlike debt and preference shares, equity shares do not have contractual obligations to be paid at pre-determined rate of interest/dividend. Besides, even if there are sufficient earnings warranting the payment of dividends, its payment is at the discretion of the management (rendering forecast of future dividends difficult). Above all, equity holders are residual claimants (after payment of debt and preference) in the assets of the firm in the event of its liquidation (again the likely amount to be received is more difficult to be forecast). Clearly, equity capital from the perspective of investors is the most risky. In financial terms, the equity holders have a higher degree of financial risk than debt holders and preference shareholders. For these reasons, the required rate of return of equity-holders is higher than that of debt holders and preference shareholders. Therefore, higher costs are associated with equity funds.

Conceptually, the cost of equity capital for a firm is the minimum rate of return necessary to induce investors to buy or hold the firm's stock. This required return is sum of the basic yield covering the time value of money plus a premium for risk. In the operational terms, it is the required rate of return of equity investors. There are two models, commonly employed to measure the cost of equity capital: (i) Model of Gordon-Shapiro (more popularly known as dividend valuation model), and (ii) Capital asset pricing model (CAPM).

78. Dividend Valuation Model

This model is similar to Porterfield's approach. It is based on a hypothesis that the market price of a share at any point of time is the sum of the present values of future dividend.

If it is expected that past growth of dividend is likely to continue in future years as well. The rate of dividend can be determined on the basis of dividends paid in preceding years. However, if the expected rate of growth is likely to be different, the expected future rate of growth of dividends needs to be estimates.

79. Capital Asset Pricing Model (CAPM) Approach

This model emphasizes the aspect of systematic (non-diversifiable) risk. According to CAPM approach, the cost of equity capital is a function of riskless rate of return (generally rate of return on treasury bonds), market rate of return consisting of expected return on the market portfolio comprising all risky assets) and the beta (β) parameter i.e., measure of non-diversifiable risk.

The CAPM approach clearly brings to the fore that cost of equity share capital is a function of (i) risk free rate of return, (ii) market risk premium expected rate of return on the market portfolio consisting of the risky assets minus Rate of return on risk free asset and (iii) the systematic risk of the particular security. The principle underlying the CAPM approach is in conformity with the basic finance theory related to risk and return, i.e. the higher is the risk, the higher is the required rate of return of vice-versa.

80. Access to foreign financial markets

It is not uncommon for many multinational corporate enterprises to have their securities quoted on several stock exchanges in foreign countries. The quoting on several markets permits multinational groups to attract a larger number of investors and this in turn results into a greater demand for their shares, leading to the lower cost of equity capital.

81. Investment in foreign securities

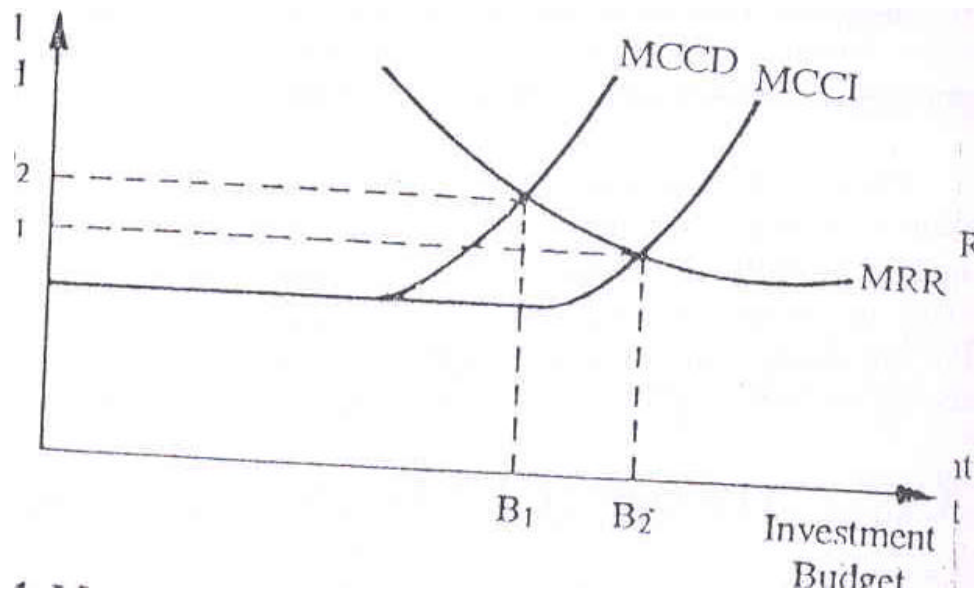
Shareholders may be attracted to invest in foreign securities especially in shares of multinational companies and may be ready to pay a higher price for the same expected inflow of dividends, for various reasons.

82. Market Segmentation

A capital market is segmented if the required rate of return on the securities of that market is different from the required rate of return on the securities having comparable risk and return characteristics, being negotiated on other markets, account being taken of political and exchange risks.

In operational terms, market segmentation is some kind of a market imperfection.

In a segmented market, the price of securities is quoted as a function of domestic criteria rather than international criteria. An enterprise that has access only to a segmented capital market is likely to have a higher cost of capital than the one having an access to several markets. On the contrary, a multinational group may raise funds in different markets and especially on international capital market or on foreign markets.



83. Marginal Cost and Return vs. Investment Budget.

It is apparent that access to international capital market permits to obtain a lower cost of capital and corresponds to a higher investment budget. Given these facts, the growth of the multinational group is likely to be stronger than that of domestic enterprise, everything else being the same.

84. Cost of retained earnings

Retained earnings have implicit costs. In operational terms, there is an opportunity cost of retentions. This in turn, is equivalent to the plausible income which could have been earned by equity shareholders themselves, if profits had been distributed among them instead of being retained by corporate firms.

Viewed from another perspective (strictly speaking) these are the funds belonging to the equity holders; they in a way, represent unissued equity on share capital. Therefore, their costs can be regarded as equivalent to the cost of existing equity capital. However, in effect, the cost of retained earnings taxes (say withholding taxes) and involves transfer costs.

85. Weighted average cost of capital

Computation of weighted average cost of capital/overall cost of capital (k_0) is now an easy exercise. It is the weighted arithmetic mean of the costs of individual long-term sources of finance. Its computation is

$$K_0 = k_e + W_e + k_p + W_p + k_d + W_d + k_r + W_r$$

Where W_e = weight of equity (i.e. the relative share of equity share capital to the total Long-term funds of the corporate enterprise)

Likewise, W_p refers to the weight of preference share capital, W_d represents weight of debt and W_r indicates weight of retained earnings.

These weights may be based on book value or market value. Theoretically, market value weights are considered superior as the costs of specific sources of finance are computed using the prevailing market price. However, in practice, there are practical difficulties in computing market value (say of retained earnings). Besides, market values are likely to fluctuate widely. No such problem is faced with book value weights.

The basic principle of finance theory to determine the cost of capital of investment projects undertaken at the level of foreign subsidiaries is to be applied, i.e., to take into account the origin of the funds that finance the subsidiary and the risk involved in the investment project.

If the investment in the subsidiary has the same level of risk as that of the group as a whole and the total finances are provided by the parent company, the cost of capital to be applied by subsidiaries is the same as that of the parent.

If the investment is partly financed by the parent company and partly by local borrowings, the weighted average cost of funds of each of the two sources would constitute the appropriate cost of capital. It may be worth mentioning capital and

accordingly the appropriate cost of equity should be taken into account. If the subsidiary is held 100 per cent by the group, the cost of equity capital of the subsidiary is equal to that of the parent group.

Alternatively, the cost of the capital of the parent group may be adapted, commensurate with the level of risk incurred by the subsidiary. The cost increases with increase in the risk level and decreases with decrease in the risk level. Likewise, if the subsidiary is located in a risky country, a higher WACC can be applied.

$$K_0 = \frac{129.6 \text{ million}}{1000 \text{ million}} \times 100 = 0.12.96 \text{ per cent}$$

The **FINANCIAL STRUCTURE OF MULTINATIONAL GROUPS** reflects the mode of financing the assets of the parent group, worldwide. The group will like to attain optimal capital structure at which the overall cost of capital is minimum or value of the firm is maximum.

This nature of WACC enables the multinational groups to have a certain margin of maneuverability to attain the optimal/sound financial structure. For the purpose, they may follow either of the two approaches: (i) adapt the financial structure of foreign subsidiaries to the financial, economic and monetary environment of the country in which they are located, or (ii) attempt to modify capital structures of its various subsidiaries in a manner so that at the level of the consolidated balance sheet of the group, it tends towards the desired structure.

86. Different ways of settling foreign operations

Foreign operations entail the adoption of a currency of invoicing, require specific methods of settlement and benefit from certain specific types of financing.

87. Currency of invoicing

The choice may be between:

- National currency of the exporter;
- National currency of the importer;
- A third currency.

In several countries, exporters have a preference for their national currency as the currency of invoicing as it avoids the exchange rate risk.

Since exporters often have greater power than importers as far as the choice of currency is concerned, it is the importing firms that suffer more from exchange rate risk.

Whenever a third currency is chosen, it is generally the American dollar (for example for petroleum imports) that is preferred.

The mode of settlement is often chosen by the exporter. In international trade, bank transfer as well as credit instruments serve as means of settlement. Included in this category are drafts, letter of credit. Cheques, International bank transfer, etc. The choice amongst these different means depends on their rapidity of conversion, cost and exchange regulations of a given country.

88. Documentary Credit (Letter of Credit)

Documentary credits perform a vital role in international trade. This represents a written guarantee by a bank on behalf of an importer to pay a certain sum to the bank of the exporter against certain document(s) (bill of lading, insurance, etc.) stipulated at the time of opening of the credit and a proof that the goods have been dispatched.

The advantage of documentary credit to an exporter is that a trade credit is substituted by a bank credit and payment is thus secured.

The advantage to an importer is that he may derive benefit accruing from favorable conditions of payment since the documentary credit confirms solvability. He is to pay only when documents correspond exactly to the conditions of documentary credit.

89. Different Types of Documentary Credit

- a) Documentary credits may be revocable or irrevocable. In practice, documentary credits used are irrevocable, because they correspond to a guarantee that can not be annulled or modified without the consent of all parties concerned. On the contrary, revocable credits may be modified or annulled at any moment without accord of the beneficiary (or the exporter). It is for this reason that they are used less often.
- b) Documentary credits may either be confirmed or non-confirmed. A confirmed documentary credit constitutes an additional guarantee for the exporter. The exporter asks another bank to confirm the credit. The confirming bank, then takes over all the engagements of the initiating bank. A non-confirmed documentary credit is the obligation only of the issuing bank. Generally, an exporter would desire a foreign bank's documentary credit confirmed by a domestic bank when the exporter has doubt about the foreign bank's ability to pay.

That confirmed irrevocable documentary credit eliminates trade risk (relating to the importer) and the risk of non-transferability (relating to the foreign bank).

There exist other types of documentary credits as well:

Revolving and non-revolving types of documentary credit. Most of the documentary credits are non-revolving, meaning thereby that they are valid for one transaction only. A revolving documentary credit is rarely issued.

Transferable credit. This type of credit permits the exporter to transfer a part or all of the credit to a third-party.

Stand-by credit. It can be issued in favor of the importer in which case it constitutes a deposit. If it is issued in favor of the exporter, it constitutes a guarantee of payment.

90. Advantages and Disadvantages of Documentary Credit

The Letter of Credit represents a guarantee for future payment. The exporter knows exactly as to when he would be recovering the amount due from the importer. The security is quasi-total and there is no need for any extra credit insurance when an irrevocable and confirmed Letter of Credit is used. However, the disadvantage is that the procedure involves numerous administrative obligations and costs are high for small transactions. At times, it is difficult to find a bank which will confirm a Letter of Credit.

91. Required Documents

These documents are usual ones that are required in international trade. The documents prove that the goods have been dispatched and are in conformity with the order.

Documents concerning goods. The bill made by the seller should contain a precise description of goods as well as an indication of unit price, quantity, total price and financial conditions of sale. Other documents are notes of weight, list of parcels (details of goods per parcel) and the marks indicated on each parcel.

Documents concerning insurance. The insurance, whether F.O.B. (free on board) or C.I.F. (cost, insurance and freight), should be specified in a manner so as to clarify if the exporter has insured the goods during their transport. The insurance policy should contain all the terms of the contract, such as:

- Names of the insurers;
- Nature of goods;
- The risks covered (all risks, fire, wreckage ...);
- Sum insured;
- Period of insurance.

Documents concerning the transport. They are generally bill of lading for sea transport, a letter of transport if it is train or air or road transport.

Other documents. Other documents may be:

- A certificate of origin, certifying that goods have been produced in a specific country;
- A certificate of quality, indicating that the goods are in conformity with specifications, etc.,

92. Different Steps of a Confirmed Documentary Credit

The different steps involved in opening a documentary credit can be enumerated as follows:

First step. The importer of the country (I) orders goods from an exporter of the country (E).

Second Step. The exporter accepts the order but wants a documentary credit. That is, he wants to obtain a bank guarantee for dispatching the goods. The exporter gives all the appropriate indications.

Third step. The importer then asks his bank I (called initiating or issuing bank) to open a credit to the benefit of the exporter in a bank of the country E. The bank of country E will receive an advice from the bank of country I towards this effect. The bank of the exporter in country E notifies the exporter about the arrival of the letter of credit.

Fourth step. The exporter dispatches goods with a bill of lading if the mode of transport is sea or a transport letter if the mode of transport is by other means. The bill of lading or transport letter is made in the name of the exporter who remains the owner of goods until payment.

Fifth step. If the documentary credit is for immediate payment, the beneficiary will receive the amount on presentation of documents. The notifying bank examines the documents to verify their conformity with the terms of the opening of the credit. If the documents are regular, the bank of the exporter pays the amount mentioned in the documentary credit. If the documentary credit is a credit by acceptance, the exporter will present the drafts at 30, 60 or 90 days, according to the credit terms, to his bank which will accept them.

In practice, documentary credit constitutes a flexible mode of financing of imports, which can be adapted to different conditions of sales. But it remains to be a relatively costly means of settlement because of the engagement of banks and their relative complexity.

93. Draft or Letter of Exchange or bill of exchange

A draft is a note issued by an exporter (drawer) who orders an importer (drawee) or his representative (bank) to pay a specified sum on a precise date. If the drawee is the buyer (importer), the draft is called trade draft; if the drawee is the buyer's bank, then the draft is called bank draft.

The letter of exchange must contain the following indications in order to be negotiable:

- It is written and signed by the drawer;
- It carries an order to pay a certain sum;
- It is payable immediately or on a definitive maturity date;
- It is payable on order or to the bearer.

Different types of classifications of drafts are as follows:

Sight draft or term draft. A sight draft is payable on presentation. A term draft is payable at the end of a defined period, say, 30, 60 or 90 days. It is presented to the drawee who should accept it. If it is the importer who accepts it, it means a trade acceptance. If it is accepted by a bank, it is bank acceptance. In a term draft, a credit is accorded by an exporter to the importer.

Simple draft or documentary draft. If it is a simple draft, no document is enclosed with it. Simple drafts are rarely used in international trade; documentary drafts are preferred instead. The use of a documentary draft assures the exporters that the importer cannot take possession of goods without paying (documentary demand draft) or without recognition of debt (documentary term draft).

Draft issued in national currency or in foreign currency. This classification is based on the currency in which the draft is drawn. If drafts are drawn in foreign currency, they will have to be brought on spot or at term.

Other Techniques of Settlement

At the outset, it may be noted that the techniques of payment vary from country to country. The major techniques followed in this regard are enumerated below:

94. International Bank Transfer

This is an order given by a debtor (importer) to a bank to pay to creditor (exporter). The sum payable may be in the national currency or in a foreign currency. This mode of settlement is very much used in France.

Cheque

In international trade, there exist two types of cheques:

- The cheques of a company which is drawn on a bank account. It should be certified by a bank so that the exporter can have the guarantee of being paid.
- The cheques of a bank are the cheques drawn by a bank on another bank. It can be made in the national currency or a foreign currency. The beneficiary of the cheques of bank is assured of payment.

However, the use of cheques in international commerce is quite limited.

95. Telegraphic Transfers

This is a form of fast payment. The importer should pay to his bank a sum in the local currency, equivalent to the amount in the foreign currency due to the exporter.

96. Postal Transfer

The corresponding banks receive the advice by post instead of receiving it by telegram.

97. Swift Network

Transfers can also be made through SWIFT (Society for Worldwide Interbank Financial Telecommunication). The remittances are fast.

98. Compensation or Counter-Trade

Counter-trade is a way to manage foreign exchange risk by ensuring that imports matched exports. It is a trade agreement, in which the sale of goods and services by a producer is linked to an import purchase of other goods and services.

99. Different Types of Counter-Trades

There are three principal forms of counter operations, namely in commerce, in industry and in finance.

Commercial counter-trade. Relevant to this category of counter-trade in goods are the systems of barter and counter purchase. Barter is one of the basic types of counter trade and it consists of a direct exchange of goods between two parties. Barter involves no currency and is included without the help of intermediaries.

Industrial counter trading. It involves repurchase of production. Such counter-trade agreements are normally of long duration. Two commonly known forms of industrial counter-trade are Offset and Buyback.

The offset is a kind of industrial counter-trade in which the importer participates in the production of goods that he will acquire later on. Offset involves co-production, transfer of technology, etc. Between the exporter and importer.

On the other hand, a buyback transaction is an agreement in which an exporter of plants and machinery accepts to take compensation in the form of future output from those plants and machinery. A buyback contract essentially comprises two parallel money transactions, and the seller is fully compensated by receipts of output from the plant and

machinery. Such an arrangement has attributes that make it, in effect, an alternative form of direct investment.

Financial counter-operations can be of different types. One commonly known is switch-trading. Switch-trading, also called triangular compensation, involves three countries. For example, a Western exporter delivers merchandise to an importing country. As payment, the importing country may transfer other goods to a third country, which then reimburses the Western exporter for the goods received. To take a concrete case, German exports destined for Poland may be financed by the sale of Polish products to France.

Project Financing

1. Characteristics of Projects

Project financing may be defined as financing of an economic unit, legally independent, created with a view to setting up a big project which is commercially profitable and financially viable. Future cash flows should be sufficient to ensure, with an adequate margin of security, coverage of operational costs and servicing of debt as well as owners' equity.

The promoter of a project may set it up all alone or in association with other partners. The project company is responsible for debt-servicing and should use, on priority basis, the cash flow for repaying the debt.

Big international projects are of varied types and cut across all sectors of activity, say construction of dams, nuclear energy plants, railway network, water treatment plants or leisure parks. They present, however, certain common characteristics:

- Project is considered as a distinct legal entity and is financed, to a marked extent, by debt. Therefore, the risk to be borne by lenders is substantial.
- Several companies participate in development of the project.

2. Project Financing.

There are two major methods of financing international projects.

- Financing with total risk borne by lenders where only the future cash flows ensure the reimbursement of the loan. This method of financing was used in petroleum and gas industry in the USA and Canada. Due to increased level of risks, this method of project financing is generally not preferred.

- In another type of financing, the risk is shared both by the lender and promoter. The problem sometimes encountered in this method is to decide the proportion in which risk will be shared between the two parties.

Apart from the above major types of financing, of late, a new mode of financing has emerged, namely, Build-Operate-Transfer (BOT). As per this method, the investor establishes the project on behalf of the promoter; on successful commissioning he also operates it; it eventually gets transferred to the owner after a certain number of years. This type of financing is becoming popular particularly in developing countries for infrastructure projects.

Sponsors are the partners in the project who bring in equity capital or risk capital. Being so, they are keenly interested in the successful completion of the project and shoulder major responsibilities as regards its execution. The fact that they bring in equity capital is an indication of their interest. Further, the amount of equity they contribute has a marked bearing on the extent of debt that can be raised for the project.

Others who bring in equity capital are the initiators of the project. Included in this category are multinational firms, future buyers of products or services of the project, the erectors of the project, the public or private investors, international organizations, development banks, etc.

3. Lenders

Financing of a big project necessitates intervention of a banking pool consortium composed of banks, national or international financial institutions, export financing institutions, etc.

4. Guarantors

Guarantees may be provided by banks, public financing organizations, international financial institutions, private insurance companies, etc.

5. Builders

Generally, there may be several builders who may group themselves as a consortium. Sometimes, there may be a single project managing agency that coordinates different tasks and directs the completion of the project.

6. Project Operators

An operating company intervenes in the correction of the project. It brings its organizational know-how to manage the project.

7. Importance of international project financial

The advantage of these projects to industries lies essentially in limiting the risks incurred. In effect, bankers are in a better position to bear such risks in view of diversification of their lendings internationally.

Finally, project financing may be rearranged in such a manner that the company may avail maximum plausible advantage related to depreciation, tax credits/facilities, deduction of financial charges, etc.

Lenders tend to receive higher compensation, commensurate with higher risks. Their participation in international financing has potentials to augment their income. Further, they can supervise the project as its development progresses and may orient it in such a way so that their interests are better looked after. By participating in these projects, the bankers acquire expertise in dealing with certain types of projects. This, in turn, help in promoting their business.

8. Financial Risk

In general, international projects are prone to greater financial risk as bulk of finance is in the form of debt. The major factors affecting financial risk are degree of indebtedness, the terms and conditions of repayment of debt, and currency used.

9. Political Risk

Political risk is another major consideration in international projects. It may emanate from increase in the rents, increase of customs duty on the imports necessary to complete the project, exchange control and non-convertibility of currency, limits on transfers, non-payment of debts committed by a previous government, war, etc.

Financing resources of subsidiaries of multinationals

The major financing sources available to subsidiaries are as follows:

- a) Internal resources of the subsidiary;
- b) External local resources;
- c) Internal resources of the group;
- d) International resources.

Internal resources of a subsidiary consist of non-distributed profits and accumulated depreciation. The quantum of internal financing depends on:

- a) The rate of growth of the subsidiary;
- b) The profitability of the subsidiary;

- c) The taxation of the host country;
- d) The dividend policy.

Local financing is generally meant to meet short-term liabilities of foreign subsidiaries. The bank credit is obtained from the local banks of the country or from branch units of the banks of the country of the parent company. The latter may accord loan more easily if they have dealings with the parent company.

Foreign subsidiaries, if quoted on the local exchange market, may tap local financial markets.

The parent group, normally, meets a lion share of the financial needs of the subsidiary at the time of its creation. This is irrespective of the fact whether the parent group acquires an existing company or creates a subsidiary ex-nihilo (from the scratch) by bringing capital and equipment, patents, brands or licenses.

Instead of lending on its own, the parent company may guarantee a loan taken by the foreign subsidiary. These guarantees facilitate financing of the subsidiary. They can equally be furnished by other sister companies. These guarantees have a character of direct investment.

International capital markets

1. Introduction

That international financing in the form of short, medium or long-term securities or credits has become necessary for the international economy. International Capital Markets have come into existence to cater to these needs.

A distinctive feature of the financial strategy of multinational companies is the wide range of external services of funds that they use on an ongoing basis.

Firms have three general sources of funds available: (i) internally generated cash, (ii) short-term external funds, and (iii) long-term external funds. External investment comes in the form of debt or equity which is generally negotiable (tradable) instruments.

2. Development of international capital markets

The main function of financial markets is to transfer current purchasing power (in the form of money) from savers to borrowers in exchange for a promise of greater future purchasing power and to allocate those funds among the potential users on the basis of returns. The consequence of well functioning financial markets is that more and better projects get financed. Now most of the major financial markets attract both investors and fund raisers from abroad. Thus, these markets are also international financial markets where foreigners can both borrow and lend money.

International financial markets can develop anywhere, provided that local regulations permit the market and potential users are attracted to it.

International Capital Markets, also called Euro-markets, are the markets on which Euro-currencies, Euro-bonds, Euro-equity and Euro-bills are exchanged. International financing in the form of short-, medium- or long-term securities or credits has become necessary for the international economy. Financing techniques have diversified, volumes dealt have increased and the process is continuing to grow.

Euro-debt or Euro-credit is medium-term loans (with variable rate linked to Euro-currency deposits *and accorded by* an international bank syndicate). The following paragraphs give a brief description of different aspects of Euro-credit markets.

The major lending banks in Euro-credit market are Euro-banks, American, Japanese, British, Swiss, French, German and Asian (specially that of Singapore) banks, Chemical Bank, JP Morgan, Citicorp, Bankers Trust, Chase Manhattan Bank, First National Bank of Chicago, Barclay's Bank, National Westminster, Credit Lyonnais, BNP, etc. Among the borrowers, there are banks, multinational groups, public utilities, government agencies, local authorities, etc.

When a borrower approaches a bank for Euro-credit, a formal document is prepared on behalf of potential borrowers. This document, inter-alia, contains the principal terms and conditions of loan, objectives of loan and details about the borrower.

Before launching a syndication, the approached bank decides primarily, in consultation with the borrower, on a strategy to be adopted, i.e., whether to approach a large market or a restricted number of banks to form the syndicate.

Each of the banks in syndicate lends a part of the loan. The duration of this operation is normally about 6 to 8 weeks. Several clauses as below may be introduced in the contract of Euro-debt:

- ***Pari-passu clause*** that prevents the borrower from contracting new debts that subordinate the interest of lenders;
- ***Exchange option clause*** that allows the withdrawal of a part or totality of loan in another currency;
- ***Negative guarantee clause*** that commits the borrower not to contract other debts that subordinate the interest of lenders.

3. Characteristics of Euro-credits

A major part (more than 80 per cent) of the Euro-debts is made in US dollars. The second (but far behind) is pound sterling followed by ECU, Deutschmark, Japanese yen, Swiss franc and others.

Most of the syndicated debts are of the order of \$ 50 million. As far as the upper limits are concerned, amounts involved are of as high magnitude as \$ 5 billion and more. For instance, in 1990, Euro-tunnel borrowed \$ 6.8 billion.

On an average, maturity periods are of about five years (in some cases it is about 20 years). The reimbursement of the loan may take place in one go (bullet) or in several installments.

The interest rate on Euro-debt is calculated with respect to a rate of reference, increased by a margin (or spread). The rates are variable and generally renewable (roll over credit) every six months, fixed with reference to LIBOR (London Interbank Offered Rate). The LIBOR is the rate of money market applicable to short-term credits among the banks of London. The reference rate can equally be PIBOR at Paris and FIBOR at Frankfurt, etc. it is revised regularly.

The margin depends on the supply and demand of the capital as also on the degree of the risk of these credits and the rating of borrowers. Financial institutions are in vigorous competition.

There are two types of commissions:

- Front-end commission such as commissions of arrangement, subscription and participation;
- Annual commission for commitment, facility and agency.

There exists an active secondary market of Euro-debts. Numerous techniques allow banks to sell their titles in this market.

4. External bond market

Euro-bonds are similar in many respects to the public debt sold in domestic capital markets. Unlike domestic bond markets, however, the Euro-bond market is almost entirely free of official regulation; instead it is self-regulated by the Association of International Bond Dealers. The prefix Euro indicates that the bonds are sold outside the countries in whose currencies they are denominated. Until recently, the Euro-bond market has been substantially smaller than the Euro-credit market. Borrowers in the Euro-bond market must be well known and must have impeccable credit rating (for example, developed countries, international institutions and multinational corporations).

Two kinds of bonds are treated in external bond market.

- Euro-bonds (or international bonds), underwritten by an international syndicate and placed on the markets of countries other than that of the currency in which the issue is made.
- Foreign bonds issued on the market of a country and bought by non-residents, in the currency of that country.

An example of foreign bonds is when a British Company in Switzerland issues bonds in Swiss francs on the Swiss market. Bonds will be quoted and sold on the Swiss market. Foreign bond markets developed first in the USA, followed by Switzerland, Japan and other countries.

Foreign bonds issued on American markets are called “**Yankee**” bond, while those issued on Japanese markets are called “**Samurai**” bonds.

The situation of external bond markets reflects the trend pertaining to the supply of resources and the demand for credits in the market. Besides, it is indicative of international economic and financial factors; it also reflects the condition of national markets as well as of interest rates.

There has been a steady increase in the business of external bond market. For instance, Euro-bonds issues were worth \$ 258 billion in 1991, this rose to \$ 368 billion by 1994. Similarly, the respective figures for foreign bonds were \$ 50.6 billion in 1991 and \$ 60 billion in 1994.

The US dollar remains by far the most used currency for Euro-bond or foreign bond issues.

5. Euro-bond Market

As already indicated, Euro-bonds are the bonds issued in Euro-currencies and placed simultaneously and in similar conditions in several countries through an international bank syndicate or consortium.

These bonds represent a loan of medium- or long-term, from 5 to 15 years, and generally carry an interest. The lender is non-resident.

6. Participants in Euro-bond Market

The major participants are enterprises and financial institutions as well as investing agencies.

Principal borrowers. In the order of importance, they are as follows:

- Private enterprisers, for example, in France, some of them are Pechiney, Renault, Rhone Poulenc, etc.
- Public enterprises;
- Financial institutions;
- Governments and Central Banks;

- International organizations, such as World Bank, European Bank of Investment, etc.

As far as the geographic origin of borrowers is concerned, the industrialized countries seem to have greater recourse to these markets; Western Europe is on the top, followed by Japan and USA.

Investors in Euro-bonds. These are special institutional investors, such as insurance companies, mutual funds, pension funds, etc.

Financial institutions. The principal financial institutions and banks that participate in these issues are of international reputation, namely Deutsche Bank, Paribas, Daiwa, Merrill Lynch, Goldman Sachs, BNP, Credit Lyonnais, etc.

7. Characteristics of Euro-bonds:

There are different types of Euro-bonds:

Straight bonds. These are most current and represent about three-fourth of the total volume. Nominal value of bonds is minimum \$ 5,000, DM 10,000, FFr 10,000, JPY 1,000,000 etc.

Floating rate bonds. The interest rate of these bonds is revised every six months. It is based on LIBOR to which a margin is added; the margin varies and it is a function of the risk of the borrower.

Convertible bonds. These bonds may be converted into shares of the issuing company. The advantage of this formula for the issuer is a lower interest rate than that on straight bonds. For the buyers of this bond the advantage is the possibility of a gain in case of significant increases in share prices.

Floating rate bonds with collar. The rates of these bonds can fluctuate between a certain minimum and a fixed maximum. The buyer of this type of bonds receives a yield rate higher than the market rate but does not benefit from the increase if the market rate exceeds the maximum fixed by the issuer.

Reverse floating rate bonds. These bonds pay a higher interest rate when the rate of reference decreases. The coupon is fixed at a rate minus-LIBOR. So, when LIBOR decreases, the interest rate increases. For clarity, suppose a Euro-bank offers a rate of $16 - \text{LIBOR}$ per cent; therefore, at LIBOR increases to 8.2 per cent, the effective rate will be $16 - 8.2$ per cent, i.e. 7.8 per cent. It may be noted that increase in LIBOR rate has, in effect, decreased the effective rate for the borrowers.

Bonds with warrant. These bonds resemble convertible bonds with the difference that warrants are detached from bonds and negotiated separately. They allow their holders to buy shares or other securities at a later date on advantageous terms.

Zero coupon bonds. These bonds do not pay interest. They are issued at a price lower than their reimbursement value to take care of yield for investors. Purchasers of these bonds pay no income tax as they do not receive interest payments. They pay taxes at a lower rate on long-term capital gain when the bonds are refunded at face value. They are more often issued by blue chip companies as the default risk is concentrated on the reimbursement on maturity.

8. Importance of Euro-shares

Euro-shares present several advantages for companies taking recourse to them:

- They improve the prestige of the company in the eyes of international financial community. Such prestige is important for the groups that have a good part of their turnover generated in foreign countries.
- They facilitate the operations of external growth. A company quoted on a foreign market may proceed to make public offers of exchange when it wants to have a control on some enterprises quoted on the market.
- They reinforce internationalization of capital. This internationalization ensures a greater stability of capital since it allows an international diversification. Besides, pension funds may invest in long-term international shares.
- However, the fact that international investors become important participants in this market poses numerous problems as regards control and management of the group.

The World Bank Group

The World Bank Group is a multinational financial institution established at the end of World War II to help provide long-term capital for reconstruction and development of member countries. The Group comprises three bodies: the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA) and the International Financial Corporation (IFC).

The IBRD, also known as the World Bank, makes loans at nearly conventional terms for projects of high economic priority. A government guarantee is a necessity for World Bank funding. The bank's main emphasis has been on large infrastructure projects such as roads, dams, power plants, education and agriculture. Of late, the bank has been emphasizing over quick loans to help borrowing countries alleviate their balance-of-payment problems. These loans are tied to the willingness of the debtor nations to adopt economic policies that will spin growth: free trade, more open economy and more vigorous private sector.

The IDB, unlike the IBRD, is authorized to make soft (highly concessionary) loans (for example, 50 year maturity loans with no interest). It does, however, require a government guarantee.

The IFC finances various projects in the private sector through loan and equity participation. In contrast to IBRD or IDA, the IFC does not require government guarantees; it emphasizes providing risk capital for manufacturing firms that have a reasonable chance of earning adequate returns and providing economic benefits to the community.

1. Regional Development Banks

Regional development banks provide funds for financing of manufacturing, mining, agricultural and infrastructure projects considered important to development. Repayment terms for loans, in most cases, are over a 5 to 15 year period at favourable interest rates. Some of the regional development banks are as follows:

European Investment Bank (EIB). It gives loan to lesser-developed regions in Europe and to associated members in Africa.

Asian Development Bank (ADB). The ADB guarantees or makes direct loans to private ventures in Asian/Pacific countries and helps to develop local capital markets by underwriting securities issued by private enterprises.

African Development Bank (ADB). The bank guarantees or makes loans and provides technical assistance to member states for various development projects.

European Bank for Reconstruction and Development (EBRD). This bank has been established to finance the privatization of Eastern Europe.

QUESTIONS AND EXERCISES

1. What do you understand by globalization of financial markets? What factors have facilitated the process of globalization?
2. What are the different international financial markets?
3. Are there any differences between financing patterns of US and Japanese firms?
4. What is securitization? How does it affect financing of multinationals?
5. Explain the functions and growth of Euro-currency markets?
6. Indicate the reasons for development of Euro-bond markets?
7. What is the difference between a Euro-currency loan and a Euro-bond?
8. What is the difference between a Euro-bond and a foreign bond?
9. Write short note on:
 - (a) LIBOR
 - (b) Euro-notes
 - (c) Primary markets
 - (d) Secondary markets
10. What role do development banks play in economic growth? Enumerate some of the development banks and their functions.

International cash management in a multinational group

International cash management of multinational firms is distinct from national firms in respect of the following:

- Billing in foreign currencies gives rise to exchange risk;
- Techniques of transfer of international funds are different;
- Exchange regulations put several constraints on foreign exchange flows.

In view of the above distinct characteristics, the finance manager engaged in international business aims at reducing the exchange risk on the one hand and minimizing the float by 'speedy' transfer on the other.

Exchange rate risk may be covered or even avoided if billing is done in the national currency. For the purpose, the finance manager may:

- Take recourse to advances in foreign currencies;
- Cover on the forward market by buying or selling;
- Cover on the futures market by buying or selling futures contracts;
- Cover on options market by selling and buying call or put options in foreign currencies;
- Cover through currency swaps.

Similarly, interest rate risk may also be minimized.

Cash management costs may be reduced by adopting various measures such as reduction of 'float'. The term float represents the time period during which the funds are not available to the enterprise since they are in the process of being transferred. In international trade, the time taken in transfers is often long (may be several weeks) and floats may be very significant.

Let us take an example. An Indian importer has bought some product from a German company. The payment can be made either in Deutschmarks or in Indian rupees.

Settlement in foreign currency (DM). The importing Indian company gives an order to its bank to make a payment in DM to the bank of the exporter. The bank of the importer buys DM on the exchange market. It notifies to its German correspondent to make the payment. The correspondent bank will debit the account of the Indian bank and credit the account of the exporter.

Settlement in national currency (rupees). In this case, exchange operations are done in the country of the exporter. The 'float' is not uniform for all countries; it varies considerably among countries. The cost of 'float' is obviously higher when the time taken in recovery is longer, when interest rates are higher and the amount in question is significant.

In order to reduce the 'float' several techniques are used, for instance, telex, Swift network, or lock-box. In the lock-box system, payments are directly addressed to a postal box and collected each day by the bank, thus eliminating the postal as well as processing time periods required before depositing the cheques in the bank. Lastly, the treasurer limits the number of banks intervening in the banking circuit and addresses himself to banks, having an international network and likely to make the transfer at the earliest. Centralization of treasury generally permits to improve the management of foreign currency flows. In selecting a technique, the finance manager should be guided by the cost involved and benefits it has in terms of simplicity and speed of recovery.

1. Different Flows of Treasury

Given below are principal flows of cash between the group and foreign subsidiary. These flows can be expressed in the national currency or in foreign currencies.

(a) Flow of funds of the Group towards the foreign subsidiary is:

- Participation in the capital of the subsidiary;
- Medium and long-term lendings;
- Cash advances;
- Payment for goods when the parent company buys the products of the subsidiary.

(b) Flows of funds of the subsidiary towards the Group are:

- Dividends;
- Rents on patents, licenses, brands (royalties). The royalties may either be calculated as a percentage of net sales or represent a fixed amount per unit sold. In certain countries, the royalties are limited to a certain percentage of sales;
- Payments of honorarium for services and technical assistance; they are considered as a fixed charge for specific services rendered during a determined period;
- Payment for goods and services: these payments for goods and services between the foreign subsidiary and the parent company pose the problem of transfer prices, etc.

In multinational groups, it is the dividends that represent the most significant flows. On an average, foreign subsidiaries of multinationals pay to the parent company 40 to 50 per cent of their profits and reinvest the remaining 50 to 60 per cent in the host country.

2. Optimization of Cash Flows

Complexity of the flows of treasury often necessitates centralization of cash management

- Either at the group level;
- Or at the level of holding;
- Or at the level of the regional centre.

The regional centre will be located preferably in a country of lower tax rates and without exchange regulations such as Luxembourg, Bahamas, Switzerland and West Indies, etc.

Organization of a centralized system of cash management requires.

- An information system;
- Planning of inflows and outflows;
- A centre of decision which balances the flows and takes decisions relating to treasury.

3. Information System

The treasurer of the regional centre or of the group should know the position of the cash of subsidiaries on a day-to-day basis in a manner so as to be able to take appropriate financial decisions (placement, use of short-term credit, compensation, etc.). Centralization of the cash management at the regional level does not dispense a unit of production or marketing from having its own treasury. The group or regional treasury ensures coordination. It collects information based on which it could do cash planning.

Table 17.1(c) Company AM – Netherlands

Forecast (\$000)

January current year

Previous Balance: - 75

Day	Receipts	Payments	Balance
Monday	200	220	-20
Tuesday	300	350	-50
Wednesday	250	200	+50
Thursday	150	160	-10
Friday	200	210	-10
			-40

These forecasts related to cash position of each subsidiary enable the regional centre to effectively assess/manage the cash position.

4. Forecasting of Cash Position.

The centre should coordinate the fund movements in a manner so as to minimize (and if possible to avoid) unnecessary costs. To achieve this, it will be useful for the treasury manager to know each day.

- Minimum cash required for each company;
- Net cash balance.

The minimum cash required for each company may be estimated from the average cash needed over the period. Once these needs are estimated, the regional centre should ensure that needs are met and excess cash if any, is appropriately dealt with (i.e.

transferred or invested). In the event of deficiency, borrowings should be resorted to or transfer from surplus subsidiaries arranged.

5. Decisions of Cash Management

The Group Cash centre should take decisions regarding the transfer of funds either from a country towards the centre or from country to country to effect balancing. Several solutions are possible. For example, the centre may give orders of transfer to the company having excess funds towards the company with a deficit.

In order to obtain the desired amount of cash, resort to Interbank transfers or credits may also be made.

The choice between these different sources depends upon the rate of interest in each country, cost of exchange operations, possibilities of credits from local banks, etc.

Very often, transfers take place from or towards the central pool which becomes a sort of compulsory point of passage for transfer of funds. This is logistically convenient too as transfers take place in different currencies and the centre should take the responsibility of covering of the exchange risk.

6. Management of receivables

The management of receivables in a multinational group should take into account several factors, such as :

- Costs of creation, retention and recovery of receivables;
- Degree of liquidity of receivables.

The management of intra-group receivables is different from that of external clients.

7. Intra-group Receivables

When a parent company has receivables of a subsidiary, it can use the technique of leads and lags for advancing or delaying settlements as per its needs. For instance, in order to finance an investment abroad it may decide to accord or make a subsidiary accord delays longer than those accorded normally for the sale of capital equipment.

8. Receivables from External Clients

If a parent company is in receipt of receivables (as payments of its exports) issued in strong currencies and if national currency depreciates, the company may wait till the last limit to encash the receivables. On the other hand, if the receivables are issued in a weak currency, it will be in the interest of the company to expedite recovery of the receivables.

EUROCURRENCY MARKET

By V.K.Bhalla

INTRODUCTION

The Eurocurrency markets constitute the short-to-medium term debt part of the international capital flow structure. The market is made by banks and other financial institutions that accept time deposits and make loans in a currency or currencies other than that of the country in which they are located. The latter characteristic defines the Eurocurrency market – it is a non-domestic financial intermediary. In the light of the rapid growth of similar institutions in Hong Kong and Singapore (and to a lesser extent in the Middle East) the market is new worldwide and is more appropriately called the “offshore” or “external” money market. Growth of this new work of intermediaries has been spectacular. The Eurocurrency market is extremely large and has grown rapidly in a short interval. It has received a bad press from central banks, which continue to call it a major cause of inflation and an obstacle to their control of domestic monetary systems. A number of basic questions and issues crop up soon as one looks at the offshore capital markets. First, what separates them from domestic markets? Second, why were they needed and how could they grow so fast when sophisticated domestic capital markets already existed? Third, is there a process of offshore money creation analogous to money creation in a domestic banking system and what effect does this have on world inflation?

THE CREATION OF EUROMONEY

There are no offshore currencies, only national currencies of different countries. A national currency deposit becomes part of the offshore currency market when it is transferred to a bank outside the controlled national monetary system. This usually means transferred to a bank outside the nation in question. Offshore deposits can be created in two ways:

- 1) One can take the physical currency of a country and deposit it in a bank in another country. Banks do hold currency of other countries but mainly for the convenience of travelers. And large quantities of currency have been smuggled out from time to time in recent years. However this is usually done with the expectations of a depreciation of the currency being smuggled, and the receiving banks quickly convert these balances into some hard currency. So this method is in general of trivial importance as a creator of deposits.
- 2) One can transfer deposits from within the country whose currency is in question to an offshore bank. This may well be an overseas subsidiary of the very same bank with which the original deposit was held.

If we confine our attention to domestic money supplies, the offshore currency markets could only cause inflationary pressure if they could lower statutory reserves against deposits by allowing transformation of deposits from one category to another (and if there were different reserve requirements against the different categories of deposits). This actually happened briefly in the United States in the late 1960s. While there were reserve requirements against banks' borrowings from foreign branches. When domestic rates came to exceed the Certificate of Deposits (CD) ceilings, then in effect, funds from domestic U.S. CDs were transferred to London branches of American banks (which faced no interest rate ceilings) and were then loaned to the parent banks. Since there were no reserve requirements, the same volume of CDs supported more loans than before.

Of course, once offshore banking systems exist in tandem with domestic banking systems it is no longer particularly meaningful to measure money supplies according to the domestic banking system exclusively. What are you interested in when you measure the money supply? What purpose do these measurements serve? If our interest is inflation, we are concerned with the demand for and the supply of money balances for transactions purposes. To the extent that they are negotiable, Euromarkets CDs are probably used as transactions balances. Analysis of problems involving the money supply should, therefore, embrace a money supply consisting of the domestic monetary aggregates plus the negotiable part of offshore deposits in the currency concerned. If the relevant domestic monetary aggregate includes time deposits, then one should include also Eurotime deposits of the same maturity.

The offshore banking system is outside the control of the central banks whose currencies it uses. We should consider briefly whether this is good or bad, or even, for some purposes, true. Let us consider first the question of whether the central banks have now lost control of the money supply and therefore of inflation. Since every Eurocurrency unit has its origin in a domestic currency deposit or cash unit, this cannot be true. Just as in a system of purely domestic banking, the central bank controls the monetary does not affect the monetary control of the central bank. The latter body must simply know that it is working with a multiplier of size x rather than size y . Hence problems in monetary control arise from variability of the size of the multiplier.

For practical purposes we have one short-term CD cum time deposit market, and whatever practical problems there are in the conception and implementation of monetary policy cannot be sensibly described as more severe in one part of this whole than in another part.

If this is so, we must explain the hostility central bankers often voice towards the offshore markets. A number of factors are important here. First, while the central banks have as much control as they ever had on creation of money, they have no control over allocation of credit in the offshore capital market. Second, as the Euromarkets are still viewed by the press and the public as mysterious and omnipotent, they make convenient scapegoats for failures of nerves in the handling of domestic monetary policy. Finally, the European central banks made fools of themselves in the 1960s in their Euromarkets

dealings in a way which they would rather forget, but which is instructive for us to examine.

In the 1960s the European central banks were pegging exchange rates, and absorbing growing dollar deficits. In the early 1960s these dollar deficits, which became dollar reserves of the absorbing central banks, were matched by growth of U.S. official obligations to foreign central banks in the U.S. balance of payments accounts. However, in the late 1960s the European central banks were surprised to observe a growing discrepancy between the change in U.S. official obligations to foreign central banks and their own record of dollar reserves held. The central bankers kept getting more and more dollars than the United States seemed to be losing on the official settlements definition of the balance of payments. The well-known economist Fritz Machulpsaid of them, “Most magicians who pull rabbits out of their hats know full well that they put them there before the beginning of the show. The magicians in (this) story, however, are more naive, they are just as surprised as the audience by the emergence of the rabbits from their hats.”

What happened? Commonly when central banks undervalued their countries' currencies against the dollar they would take the dollars they received in pegging the price and buy U.S. Treasury Bills with them. From an accounting viewpoint, the U.S. deficit with Germany, say, equaled in dollar value the German surplus with the United States. A U.S. deficit with Germany meant that more dollar cheques were written to purchase DM and DM cheques were written to purchase dollars. The Bundesbank became the owner of the excess U.S. demand deposits, which it used to purchase Treasury bills. Thus the U.S. deficit was represented by these excess demand deposits but entered the official settlements balance only when the demand deposits were converted to bills.

Now suppose a foreign central bank decided to earn higher interest on its reserves by converting its acquired U.S. demand deposits to Eurodollar CDs rather than Treasury bills. As we have seen, such an action transfers the ownership of the U.S. demand deposits representing the new foreign reserves to some private, offshore bank. Originally, these U.S. deposits were turned into foreign exchange to create the capital outflow that the European central bank absorbed. Subsequently they became the property of the private foreign bank. This was not recorded on the official settlements part of the balance of payments accounts though it certainly constituted foreign reserves created by the deficit, just as before. This explains part of the mystery, but the best part is yet to come.

Consider what might have happened to the Eurodollar deposits owned by the foreign central banks. Under the fixed exchange rate system there were periodic exchange crises, during which people would try to switch other currencies into DM or Swiss francs in anticipation of appreciation. Frequently the offshore banks would lend the dollar deposits of the Swiss and German central banks to speculators who convened them into DM or Swiss francs. Under their exchange pegging policies, these tendered dollars had to be absorbed by the central banks, who re-deposited in the offshore markets, so that they could be lent again! This is the rabbit in the hat trick of which Machulpsaid was

speaking. The central banks came to own very large Eurodollar claims by this circular process, but these large claims were not on the United States but rather (indirectly) on the speculators.

EXPLANATION FOR THE GROWTH OF THE EUROMARKETS

The Euromarkets are not a bogeyman but an unregulated financial intermediary. They bring together borrowers and lenders, frequently from the same country. They deal only in the currencies of individual countries and are thus a substitute for the domestic banking system. The incredibly rapid growth of the Euromarkets shows that they were a strongly preferred substitute. But why? The question has an obvious answer. An offshore credit market will not exist unless.

- depositors receive better terms than they can receive onshore, and
- borrowers can borrow more, possibly at lower rates, than they can

The rapid emergence in the 1960s of a world-wide Eurocurrency market that co-exists and competes with traditional foreign exchange banking resulted from the peculiarly stringent and detailed official regulations governing residents operating with their own national currencies. These regulations contrast sharply with the relatively great freedom of non-residents to make deposits or borrow foreign currencies from these same constrained national banking systems. On an international scale, offshore unregulated financial markets compete with onshore regulated ones. The differences in national regulatory regimes and the internationalisation of finance brought the birth of the Eurodollar markets.

EURODOLLAR MARKETS

Eurodollars are bank deposit liabilities denominated in U.S.dollars but not subject to U.S. banking regulations. For the most part, banks offering Eurodollar deposits are located outside the United States. However since late 1981 non-U.S. residents have been able to conduct business free of U.S. banking regulations at International Banking Facilities (IBFs) in the United States. Eurodollar deposits may be owned by individuals, corporations, or governments from anywhere in the world, with the exception that only non-U.S. residents can hold deposits at IBFs.

Originally, dollar-denominated deposits not subject to U.S. banking regulations were held almost exclusively in Europe; hence, the name Eurodollars. Most such deposits are still held in Europe, but they also are held at U.S. IBFs and in such places as the Bahamas, Bahrain, Canada, and Cayman Islands, Hong Kong, Japan, the Netherlands Antilles, Panama, and Singapore. Regardless of where they are held, such deposits are referred to as Eurodollars.

Bank in the Eurodollar market, including U.S. IBFs, compete with banks in the United States to attract dollar-denominated funds. Since the Eurodollar market is relatively free of regulation, banks in the Eurodollar market can operate on narrower margins or spreads between dollar borrowing and lending rates than can banks in the United States. This gives Eurodollar deposits an advantage relative to deposits issued by banks operating under U.S. regulations. In short, the Eurodollar market has grown up largely as a means of avoiding the regulatory costs involved in dollar-denominated financial intermediation that contributed to the rise of the Eurodollar markets. Some of the basic factors are: (i) U.S. financial regulation played a very large role in the creation of the Eurodollar markets, especially Regulation Q. (Restriction on currency convertibility prevented the commercial exploitation of U.S. dollar held in Europe, while low interest rates in the U.S. enforced by Regulation Q depressed the returns. This was reinforced by Interest Equalization Tax in 1963. These conditions were in part responsible for the Eurodollar market centered in London). (ii) The U.S. balance of payments deficits and to the accumulation of dollars stride the U.S. (iii) The U.S. dollar was the key international currency for trading and for reserve purposes, (IV) No reserve ratios were required in many of the countries, therefore, off-balance sheet funding outside the regulatory controls was possible enabling the establishment of Eurodollar markets.

Within the turbulent environment the inter-bank (Eurodollar) market soon became the central mechanism to channel international flows of funds amongst banks. This truly international market linked the various components of the international financial system to the corresponding domestic market.

The internationalization of finance placed international and national regulatory systems era under further stress to liberalize financial markets and remove the long standing barriers to trade in financial services. This trend enveloped several related developments, most notably: some countries allowed foreign institutions a larger role in domestic financial markets; the erosion of domestic restrictions on capital markets; and the increasing integration of domestic and international markets.

These changes initiated national policies of liberalization and deregulation which were designed to attract capital to these financial markets. Furthermore, they have been characterized by a trend toward a breakdown in the segmentation of financial markets. Distinctions among services offered by different financial institutions are blurring in many countries, and national markets are becoming increasingly integrated internationally. The nature and extent of these changes differ across countries, but almost everywhere competition in financial markets has intensified.

The Size of the Eurodollar Market:

Eurodollar volume is measured as the dollar-denominated deposit liabilities of banks located outside the United States. For example, the Bank for International Settlements (BIS) defines and measures Eurodollars as dollars that have “been acquired by a bank outside the United States and used directly or after conversion into another

currency for lending to a nonblank customer, perhaps after one or more redeposit from one bank to another”

The sum of all dollar-denominated liabilities of banks outside the United States measures the gross size of the Eurodollar market. For some purposes, it is useful to net some Interbank deposits out of the gross to arrive at an

Eurodollar market. For sum other purposes, such as comparing of deposits created in the Eurodollar market with the U.S. monetary aggregates, it is useful to further net out all banks – owned Eurodollar deposits. Doing so leaves only the nonblank portion of the net size measure, or what might be called the net-net size of the Eurodollar market.

The most readily accessible estimates of the size of the Eurodollar market were compiled by Morgan Guaranty Trust Company of New York and reported in the monthly bank letter, *World Financial Markets*. Morgan’s estimates included data compiled by the BIS. However, Morgan’s estimates were somewhat more comprehensive. Morgan reported estimates of the size of the entire Eurocurrency market based roughly on all foreign-currency liabilities of banks in major European countries, nine other market areas, and U.S. IBFs. Morgan stopped publishing its Euromarkets data in 1988.

As of March 1988 Morgan estimated the gross size of the Eurocurrency market at \$4,561 billion; the net size was put at \$2,587 billion. Morgan also reported that Eurodollars made up 67 percent of gross Eurocurrency liabilities, putting the gross size of the Eurodollar market at \$3,056 billion. No net size for the Eurodollar market was given. However, 67 percent of the net size of the Eurocurrency market yields \$1,733 billion as an approximate measure of the net size of the Eurodollar market.

M2 is the narrowest U.S. monetary aggregate that includes some Eurodollar deposits. M2 includes overnight Eurodollar deposits held by U.S. residents other than depository institutions and money market funds at branches of U.S. banks worldwide. As of May 1991, M2 measures \$3,396 billion; its Eurodollar component was \$ 17.8 billion. This comparison shows clearly that Eurodollar deposits account for a relatively small portion of monetary assets held by U.S. residents.

Instruments of the Eurodollar Market

The overwhelming majority of money in the Eurodollar market is held in fixed-rate time deposits (TDs). The maturities range from overnight to several years, although most are from one week to six months. Eurodollar time deposits are intrinsically different from dollar deposits held at banks in the United States only in that the former are liabilities of IBFs or of banks located outside the United States. The bulk of Eurodollar TDs are Interbank liabilities. They pay a fixed, competitively determined rate of return.

Another important Eurodollar instrument is the Eurodollar certificate of deposit (CD). Essentially, a Eurodollar CD is a negotiable receipt for a dollar deposit at a bank

located outside the United States or in a U.S. IBF. From their introduction in 1966, the volume of Eurodollar CDs outstanding reached roughly \$ 50 billion at the beginning of 1980. By late 1990, Eurodollar CD volume was around \$ 130 billion. The 1990 elimination of the 3 percent reserve requirement on nonpersonal time deposits and CDs in the United States has made the Eurodollar CDE market a bit less active. In 1992, volume had fallen to around \$ 116 billion.

Recently, fixed-rate, three-month Eurodollar CDs have yielded approximately 10 basis points below the three-month London Interbank Offered Rate (LIBOR). *LIBOR is the rate at which major international banks are willing to offer term Eurodollar deposits to each other.* An active secondary market allows investors to sell Eurodollar CDs before the deposits mature. Secondary market makers' spreads for short-term fixed-rate CDs have been 1 to 3 basis points for European bank dollar CDs and around 5 basis points for Japanese bank dollar CDs.

Eurodollar CDs are issued by banks to tap the market for funds and are commonly issued in denominations of from \$250,000 to \$5 million. Some Eurodollar CDs, called Tranche CDs, are issued in very large denominations but marketed in several portions in order to satisfy investors with preferences for smaller instruments. The latter are issued in aggregate amounts of \$10 million to \$30 million and are offered by banks to individual investors in \$10,000 certificates, with each certificate having the same interest rate, issue date, interest payment dates, and maturity.

In the late 1970s Eurodollar floating-rate CDs (FRCs) and Eurodollar floating-rate notes (FRNs) came into use as means of protecting both borrower and lender against interest rate risk. By making their coupon payments float with market interest rates, these "floaters" stabilize the principal value of the paper. The market for FRCs is no longer active. The volume of FRNs outstanding fell from \$125 in 1986 to \$ 116 in 1990.

Eurodollar FRNs have been issued in maturities from 4 to 20 years, with the majority of issues concentrated in the five-to seven- year range. Eurodollar FRNs tend to be seen as an alternative to straight fixed-interest bonds, but they can in principle be used like FRCs. Eurodollar FRNs have been issued primarily by banks and sovereign governments. FRNs issued by governments are not Eurodollars proper since they are not bank liabilities. Strictly speaking, they should be referred to as Eurodollar instruments together with the NIFs and Euro commercial paper discussed below.

Eurodollar FRCs and FRN are both negotiable bearer paper. The coupon or interest rate on these instruments is reset relative to the corresponding LIBOR every three or six months. The rate is set below LIBOR for sovereign borrowers and above for U.S. banks. Yields on Eurodollar FRNs range from 1/8 percent under the London Interbank Bid Rate (LIBID) up to LIBOR. To determine LIBOR for Eurodollar FRNs, "the issuer chooses an agent bank offices of major international banks. Rates are those prevailing at 11.00 a.m. London time two business days prior to the commencement of the next coupon period."

A secondary market exists in FRNs. The spread quoted on FRNs in the secondary market is generally 10 cents per \$100 face value for the liquid sovereign issues. Other spreads are quoted on an indicative basis and are somewhat higher.

Note issuance Facilities (NIFs) became a significant Eurodollar instrument in the mid-1980s. A NIF is a medium-term, usually five – to seven-year arrangement between a borrower and an underwriting bank under which the borrower can issue short-term, usually three- to six – month, paper known as Euro-notes in its own name. Under such an arrangement, the underwriting bank is committed either to purchase any notes the borrower cannot sell or to provide standby credit at a predetermined spread relative to some reference rate such as LIBOR. Underwriting fees are paid on the full amount of the line of credit, regardless of the amount currently drawn. The fees are 5 basis points for top borrowers and ranges up to 15 basis points for worse credit risks. The notes are issued with face amounts of \$100,000, \$500,000, or more.

Well-regarded borrowers can issue Euro-notes at around LIBID. Top borrowers can issue at yields 1 / 16 or 1/8 percentage point below LIBID. Euro-notes are comparable investments to Eurodollar CDs.

When the market initially matured around 1985, nonblank corporate borrowers accounted for roughly 60 percent of NIFs arranged. Most borrowers were from countries in the Organisation for Economic Co-operation and Development. As of April 1986, about \$75 billion of NIFs has been arranged, with only an estimated \$10 to \$ 15 billion having been drawn. Most paper was placed with smaller, non-underwriter banks. In 1985, about one-third or more of placements may have been with nonblank investors, including money market funds, corporations, insurance companies, wealthy individuals, and central banks.

Since mid-1984, facilities similar to NIFs have been arranged without underwriting commitments. In the second half of 1985, new non-underwritten agreements equaled new NIFs arranged. Non-underwritten become much like U.S. commercial paper programmes: note issuance has been separated from the standby a arrangement, notes are issued in shorter odd maturities, and notes can be marketed quickly Under such an arrangement, a bank is simply a marketing agent. Euro-notes issued under such conditions are known as Euro commercial paper. The volume of newly arranged NIFs declined from \$40 billion in 1985 to \$4 billion in 1990, while Euro commercial paper outstanding rose from \$ 17 billion in 1986 to \$ 70 billion in 1990. Recently strengthened risk-based capital requirements have, in part, induced the shift to Euro commercial paper because they have raised the regulatory cost associated with NIFs. Euro commercial paper yields range from LIBID minus 25 basis points for top-rated sovereigns to LIBOR plus 30 for low-rated corporations.

For most U.S. corporations, the U.S. commercial paper market probably remains a cheaper source of funds than Euro commercial paper. For some non-U.S. corporations, however, Euro commercial paper may be as cheap as U.S. commercial paper because of the premium that foreign issuers pay in the U.S. commercial paper market. Like the U.S.

commercial paper market, the secondary market for Euro commercial paper is relatively underdeveloped. If a client needs to sell paper before maturity he will almost always sell it to the dealer who sold him the paper initially. Any trading usually occurs in the first few days after the paper is issued. Trading is most frequent in the sovereign sector, which accounts for about 20 percent of Euro commercial paper outstanding.

CREATION OF EURODOLLARS

Eurodollar markets are well organized, very efficient, and very large. They serve a number of valuable purposes for multinational business operations. Eurodollars are a convenient money market device for multinational firms to hold their excess liquidity. Eurodollars are a major source of short-term loans to finance corporate working capital needs and foreign trade. Many multinational companies and governments have learned to employ the Eurodollar market as readily as they do the domestic or banking system. The major sources of Eurodollars are (1) the growing dollar reserves of oil-exporting countries, (2) foreign governments or businessmen who prefer to hold dollars outside the United States, (3) foreign banks with dollars in excess of current needs, and (4) multinational companies with excess cash balances. Since the 1974 oil crisis, oil-exporting countries have had enough leverage on the worldwide oil supply to impose a major price escalation. As a result, the Middle East, where more than half of the world's known oil reserves are located, has acquired enormous economic wealth and has become the important source of Eurodollars. Once Eurodollars come into existence, they can create themselves through the lending and investing activities of commercial banks. T-accounts may be used to illustrate such Eurodollar creation.

Example – 1

Assume that the International Trading Company holds \$1,000 on deposit in a New York bank. If the reserve requirement is 20 percent, the \$1,000 deposit will be reflected in the books of the New York bank, the International Trading Company, and the Federal Reserve Bank of New York as follows:

Cash flows in a commercial bank involve four major elements of information: (1) currency, (2) institution and location, (3) maturity date, and (4) interest rate. To better understand how bank transfers take place and how Eurodollars come into existence, let us examine a few transactions.

Step 1. Assume that the International Trading Company decides to transfer its \$1,000 deposit from the New York bank to a London bank. Let us further assume that the International Trading Company decides to maintain its dollars in a dollar-denominated 90-day deposit account at the going rate with the London bank. This situation will be reflected in the books of the New York bank, the London bank, the London bank, and the International Trading Company as follows:

By this step, a Eurodollar deposit has been created. The London bank has now obtained the power to deal in dollars outside the United States; however, that total deposit levels in the United States have not changed; the \$1,000 liability of the London bank is matched deposit in the New York bank. The only change at the New York bank was in the name of the depositor from the International Trading Company to the London bank.

Step 2. Because the London bank has to pay interest on its 90-day deposit liability to the International Trading Company, it decides to extend a Eurodollar loan of \$1,000 to a Paris firm. This loan transaction will be reflected in the books of the London bank and the Paris firm as follows:

Because the New York bank still has \$1,000 deposit liability to the London bank, its balance sheet has not changed. But the London bank has increased its deposits and loans by \$1,000. This expands the total Eurodollar deposit liabilities of non-U.S. banks to \$2,000. The International Trading Company now holds \$1,000 of Eurodollars with the London bank and the Paris firm has an additional \$1,000 of Eurodollars in the London bank.

The London bank exhausted its dollar lending capacity. Thus, if the Paris firm had held its dollar deposit with the London bank, the multiple creations of Eurodollars would have stopped. However, if the Paris firm withdraws its dollar deposits from the London bank and deposits it with a Paris bank, the Eurodollar creation process could continue.

Step 3: Assume that the Paris firm withdraws its deposit from the London bank and deposits it in a Paris bank. The following set of T-accounts record the event.

After Step 3 the amount of Eurodollars is still \$2,000, but the Paris bank has obtained Eurodollar deposits that it can lend out. The potential expansion of Eurodollars is infinite in the case where banks do not maintain any reserves against their Eurodollar deposits.

DEFAULT RISK OF EUROCURRENCY BANKS

The offshore monetary system is an unregulated banking system with no lender of last resort. Except in a very informal way there are no bank inspections by any central bank to evaluate the soundness of the loan portfolio. Parent banks obviously have a very large stake in the credit-worthiness of their subsidiaries but ultimately do not give unconditional guarantees. This contrasts sharply with domestic banking systems, whose very comprehensive regulation has been in large part justified by the need to protect depositors. Yet there have been very few defaults of unregulated offshore banks, despite

the immense pressures they have experienced in the 1970s, starting with the oil embargo and the recycling of the petro-dollars. We must explain this remarkable record of solvency. The key to any such explanation is the principle that in an unregulated banking system the riskiness of a bank's loan portfolio will be policed by depositors. They have no choice. In a regulated system, depositors have little or no incentive to care how or to whom their bank lends. The bank inspectors are a necessary corollary of regulation and deposit insurance.

The two principle sources of risk for banks are:

- 1) bad loans, and
- 2) Default due to dependence on maturity transformation and the occurrence of an unfavorable term structure.

The bad loan problem is the same for domestic as for foreign banks for the most part. The striking thing about the Euro banking system is its restraint in the matter of maturity transformation. Perhaps 90% or more of Euro credit is on a floating rate basis. Regardless of maturity, the usual adjustment being at six-month intervals. Thus the borrower is obliged to compensate the lender for the cost of six-month money and the only effective maturity transformation is from liabilities of less than six months maturity to these six-month assets.

There are a number of differences between dealing in Euromarkets and dealing in domestic money markets. Two important features characterize the Eurocurrency market: the absence of reserve requirement and the international character of the competitive advantage in dealing with reservable transactions that is, those involving lending to corporations or other non-banks – in comparison to its domestic counterparts. It was, of course, from this competitive advantage that the rapid growth of the Euromarkets originally sprang. A corollary of the absence of reserve requirements is the absence of direct control by central banks. This means that there is – at least in theory – no direct lender of last resort for the Euromarkets. Central bankers are gradually feeling their way toward some partial solutions of this problem, but the situation is certainly not as clear-cut as in each country's domestic markets.

The international character of the Eurocurrency market means that, like the foreign exchange market, the Euromarkets does not exist in any particular location. It consists of participants all around the world linked together by telephones, telexes, and increasingly by computerized information systems, such as those provided by Reuters and Telerate. It is therefore a continuous market, starting in the Far East and running throughout the Middle East and Europe until it comes around to San Francisco, which overlaps again with the Far East. The international nature of the market raises a number of problems, not the least of which is language and telecommunications problems. More important, though, there are a number of gray legal areas, such as jurisdiction, the acceptability of a freeze on deposits in one country by another country whose currency is being traded in the first country, the question of whether booking a loan in one centre rather than another is merely legitimate tax planning, or tax evasion, and many other

questions that have not been fully resolved. Because the Euromarkets is a fluid and evolving market, certainly the most dynamic deposit dealing market in the world, many of these questions probably will never be finally settled; in some respects this is probably for the best since the innovative capacity of the market has depended greatly on its relative freedom from bureaucratic regulations.

Another important feature of the market in which it differs from domestic markets is that it is a purely wholesale market. Although some banks in the United States allow some individual customers to place funds through them into the Euromarkets with a view to obtaining a better return, trading in the Euromarkets proper is typically done in blocks of \$1 million and upward. The major advantage, again, is the relative freedom from regulation in a wholesale market compared with the retail banking market, which is typically heavily regulated in many countries.

Finally, another significant difference between the Euromarkets and many domestic deposit markets is that the Euromarkets is almost exclusively concerned with matched deposit dealing. That is, each deposit (liability) of an international bank will tend to be matched by an asset (usually a deposit in another bank) of the same currency and of similar maturity. Deliberate mismatches might be incurred with a view to making a profit, but the book of each bank as a whole will be matched within certain periods. Hence loans are typically made for a specified period and funded by a deposit of a similar period. This is very different from a domestic market where typically large amounts of lending are done on the basis of a prime (or base) rate, with these loans being funded day to day in the domestic overnight or short-date money market, or from normal customer deposits.

OPERATION OF THE EUROMARKETS

There are two levels of offshore currency transactions.

1. A highly competitive wholesale market centered in London which determines the basic deposit rates on placements by large non-bank firms and by commercial banks. These banks sell their funds to each other as need arises, at a basic interest rate called LIBOR (London Interbank Offered Rate). All transactions are undertaken by telephone or telegraph, telex, dealing screen via brokers, so the bank cannot be sure which other banks they are negotiating with until after a deal is consummated. The use of such quick means of communications means that a person's word must validate transactions in huge sums of money. Thus only the best "name" banks can transact on this wholesale market. Certain very large and well known nonbank borrowers have access to the wholesale market, but most do not.

2. A retail business on loans: Smaller banks, nonbank borrowers, governments of developing countries can acquire loans only after credit investigation. The first to borrow Eurodollars were corporations whose name, size and good standing enabled banks to make loans to them with a little more than a cursory analysis of credit standing. In recent years, the range of corporate and governmental borrowers has spread considerable. Even domestic firms with no international activities are relying on Euro loans when local credit conditions become tight.

In order to explore the lending practices of the Eurocurrency system, it is useful to refer to the hypothetical balance sheet of a Euro bank, presented in Table -1.

TABLE -1.

Typical Eurobank Balance Sheet Components.

Sl. No.	Liabilities	Sl. No.	Assets
1.	Interbank deposits	1.	Reserve balances
2.	Nonbank time deposits	2.	Liquid assets
3.	London dollar and other currencies CDs	3.	Interbank loans
4.	Notes and bonds	4.	Other loans
5.	Loans from other branches		
6.	Loans from parent bank		
7.	Equity capital held by parent bank.		

An important financial obligation now shown on financial statements of a Eurobond is the loan commitments held with the bank by other financial or nonbank institutions. These involve a commitment by the bank to lend funds at some future date, and therefore can involve a substantial financial liability at a time of tight credit. Conversely, the asset side of the balance sheet does not show the lines of credit that the Eurobank might have contracted for some future date with other Eurobank and domestic

banks. Interbank deposits, non bank time deposits, and London dollar CDs represent the bulk of the liabilities of a Eurobank. Interbank transactions bulk particularly large and we will shortly see why. The final depositor in the Eurocurrency market can choose among two major financial instruments. Most funds are raised by fixed time deposits (TDs), the other source being certificates of deposit (CDs). The maturities of time deposits range from one day to several years but most of them are in the one week to six months range. Negotiable certificates of two different forms: the top CDs issued in single amounts by certificates of two different forms: the top CDs issued in single amounts by a bank, which remain an Interbank financial instrument; and the Tranche CDs, which are managed issues by several banks and denominated in smaller amounts, so that they can be attractive to corporations and individual investors.

While borrowers often want to borrow for longer than five years, CDs are not currently issued for any longer maturities. Thus there have developed forward CDs, whereby a bank will issue and other banks will agree to contract CDs at a fixed or floating interest rate at some given future date. This device allows banks to make medium term loans to corporations or governments which extend beyond five years and be certain of available resources.

Loans in a specific currency are priced according to a “LIBOR plus” principle. Three parameters usually determine the cost: a *commitment fee*, which is per annum fee expressed as a per cent on the undrawn, uncanceled portion of the loan; a *front end fee* which is a one-time payment, expressed as a percentage of the amount of the loan, usually paid shortly after the signing of the loan; and a *spread* which is the percent per annum margin added to the bank’s cost of funds, which is LIBOR. The sum of these pricing elements allows us to determine a total spread, which is annualized and represents the total margin of the loan expressed as an annualized percentage over LIBOR. Under this pricing procedure, the most common in the Eurocurrency market, Euro loans are floating rate loans which depend on the value of LIBOR. The total spread over LIBOR varies with market conditions. Historically it has varied between ½ % to 3%. If one compares the pricing of Euro loans with domestic loans, the principle difference are as follows: Euroloans do not involve compensating balances but rather involve commitment fees on the unused part of credit lines, and the front-end fee has become of substantial importance in the Euromarkets. Since credit standing is measured by markup over LIBOR, there has arisen a willingness of weaker borrowers to trade larger front-end fees for lower markups. On a present-value basis the outcome is equivalent, but a lower markup is supposed to have cosmetic advantages.

FUNCTIONS OF THE EUROMARKETS

We can distinguish three distinct functions served by the offshore financial system:

1. Foreign exchange hedging

In the Eurocurrency markets, commercial banks can take positions that cover the forward commitments they have made vis-a-vis their customers. Let us suppose, for example, that the London branch of Citibank has agreed to loan French francs to a French corporation. It has then acquired a foreign currency asset which it can turn immediately to a dollar asset by engaging in the forward sale of French francs with the BNP in London, with the maturity of the forward sale corresponding to the maturity of the loan. Conversely, a dollar loan can be converted immediately into any foreign currency asset by a forward purchase of the foreign currency in which the bank wants to have the asset. Also, forward currency commitments can be hedged by offsetting depositing or borrowing transactions. It is only a short step from such activities to covered interest arbitrage, which is an important Interbank activity.

2. Domestic intermediation

The offshore markets can at times partially supplant normal channels of domestic financial intermediation when the government imposed a serve credit policy on the banking system and at the same time encouraged corporations to seek the necessary financing they needed in the Eurocurrency system.

3. International intermediation

The offshore market channel liquid resources from countries with a loanable surplus to those with a desire to borrow. The most striking example of this is the so-called “recycling of petrodollars”. When OPEC countries started rolling in cash in 1973, almost everyone predicted a collapse of the world financial system because all those dollars were going to the Arab countries, and everybody wondered how all the importing countries would pay their bills. The dollars were in fact deposited by the OPEC countries in the Eurocurrency system and relent to the importing countries as one might have expected. The real impact of OPEC oil price rise has been a transfer of income it has brought about, not the financial flows that have resulted.

WHY ARE THERE SO MANY INTERBANK TRANSACTIONS?

As was mentioned earlier when we presented the theoretical balance sheet of a Eurobank, Interbank transactions represent a large part of the activity of a Eurobank. The actual figure for the size of the Eurocurrency markets vary depending on the source and method of calculation. The most agreed-upon figures are those given by the Bank for International Settlements (BIS) annual reports. Other sources include Morgan Guaranty Trust and Bankers Trust. More than a third of the volume of transactions is Interbank

trade rather than transactions with non-bank depositors or non-bank borrowers. The BIS figures for the size of the Eurocurrency system net out all the Interbank transactions. The BIS figures, which are the most commonly reported ones, treat the system only as a financial intermediary. If the covered interest arbitrage and foreign exchange hedging aspects of the market are considered, a good part of the inter-bank transactions represent legitimate economic transactions and not just reshuffling of funds within the network of intermediaries.

ILLUSTRATIVE PROBLEMS

1. XYZ Trading Co. of the United Kingdom receives \$1,000,000 in payment for exports to ABC Electronics Philadelphia, Pa. (XYZ Co., banks with Barclays- London, and ABC banks with Philadelphia Security Bank. $S_0 \$/\pounds = 1.35$.)

- a) XYZ Trading Co. keeps amount in deposit in Philadelphia Security Bank.
- b) XYZ Trading Co. asks its bank to transfer export proceeds to its account in pounds sterling.
- c) Instead of (b), XYZ Trading Co. transfers dollar proceeds from Philadelphia Security Bank, and places it with its own bank as a time deposit denominated in dollars.

Show the above transactions in T-accounts of Barclays and Philadelphia Security Bank.

Hence, a Eurodollar deposit of \$1,000,000 was created in (c).

2. a) Show the following transactions in T-accounts of the banks involved in the transactions.
- b) Indicate the total amount of Eurodollar deposits created by these transactions.
- c) What is the value of the Eurodollar deposit multiplier? Identify the factors that determine the value of the multiplier.

Transaction (1)

XYZ Co. (Netherlands) exported to ABC, Inc. (U.S.) goods valued at \$1,000,000. The importer paid by cheques drawn on Citibank (N.Y.). XYZ Co. asked its bank (Algemene Bank of the Netherlands) to credit its account in Dutch guilders with the proceeds of the transaction. (The exchange rate on the value date of the transaction $S_0 \text{ f1}/\$ = 2.7715$.)

Transaction (2)

Algemene Bank places the \$1,000,000 it has in Citibank (N.Y.) as a time deposit in Shanghai – Hong Kong Bank (Hong Kong).

Transaction (3)

Shanghai-Hong Kong Bank makes a loan of \$900,000 to Nestle Co., (Netherlands). Nestle Co. deposits the cheques in its account with the National Bank of the Netherlands and asks its bank to credit its account with the equivalent in Dutch guilders. (The exchange rate on the value date of the transaction is $S_0 F1/\$$ is 2.7750.)

Transaction (4)

The National Bank of the Netherlands makes a loan of \$ 750,000 to Nova Industries (Denmark). Nova Industries uses the loan to settle an import transaction from Bristol Myers (N.Y.). Bristol Myers maintains its accounts with Chase Manhattan Bank (N.Y.).

(b) Total amount of Eurodollar deposits created is \$1,000,000 (time deposit of Algemene Bank with Shanghai-Hong Kong Bank denominated in U.S. dollars).

(c) The value of the Eurodollar deposit multiplier here is unity. The value of the multiplier depends on:

- (1) successive stages of time deposits denominated in U.S.dollars placed at financial institutions outside the continental United States, prior to leakages in the form of deposits in local currency or payment to U.S. residents, and
 - (2) The ratio of reserves observed on a voluntary basis by lending institutions outside the United States.
2. The following transactions are designed to follow the path of some of the flows that take place in the Euro-dollar market.

Assume: 1. All foreigners keep their balances in the United States with the Chase Manhattan Bank.

2. All banks keep 10% of their deposits in reserves.

At the end of each transaction determine what the impact is on:

1. Each of the parties involved.
2. The U.S. money supply.
3. The U.S. balance of payments on the liquidity basis and on the official transaction basis.
4. The money supply of each foreign country involved.
5. The balance of payments of each foreign country involved.

Transaction No. 1. The German Central Bank, which maintains part of its foreign exchange reserve in the form of treasury bills, decides to sell \$100 worth of treasury bills to Mr. Smith, an American resident. Mr. Smith pays with a check drawn on his account with Chase Manhattan.

Transaction No. 2. The German Central Bank transfers its deposits to a German commercial bank. (Sometimes this is done as part of domestic monetary policy in which case the Central Bank exchanges dollar deposits for deutsche marks with the commercial banks. The objective is to reduce credit in the domestic market and give incentives for capital outflows.)

Transaction No. 3. A French importer asks for a Euro-loan from the German Commercial bank. Assuming that the commercial bank keeps a precautionary reserve of 10%, it can make a loan in the amount of \$90.

Transaction No. 4. The French importer uses the Euro-loan to pay a debt owned to a German exporter.

Transaction No. 5. The German Exporter deposits its dollar balances with the German commercial bank.

Transaction No. 6. Citibank wishes to borrow Euro-dollars from the German commercial bank to take care of anticipated loan demand.

Transaction No. 7. Citibank wishes to make a loan. In order to convert the deposit at Chase into lendable funds it asks Chase to provide cash or deposits with the Federal Reserve Bank. Since Chase was fully loaned-up, it has to sell some loans in order to collect the required amount of cash.

Show these transactions in T-accounts of the banks involved in the transactions.

Ans:

The transactions described below are represented by “T accounts” at end.

Transaction No. 1.

Chase: There is only a change in deposit ownership from Mr. Smith to the German central bank.

German Central Bank: There is an exchange of assets from securities to deposits.

Money supply in U.S. and Germany remains constant.

Balance of payments of each country has offsetting entries.

Transaction No. 2.

Chase: There is only a change in deposit ownership from German central bank to the German commercial bank.

German Central Bank: An exchange of assets from claims on Chase to claims on the German commercial banks.

German Commercial Banks: Euro-dollar deposits have been created. The assets associated with these deposits can now be used to make loans.

Money supply in U.S. remains constant.

Money supply in Germany has increased by the size of the Euro-dollar deposit except if it was in exchange for DM's in which case the money supply remains constant.

Balance of payments of the U.S. on the liability basis has canceling entries. On the official basis there is an improvement as claims of official institutions on the U.S. are reduced.

Balance of payments of Germany deteriorates on an official transaction basis as official institutions' claims on foreigners decrease.

Transaction No. 3.

Chase: There is only a transfer of deposit ownership from the German Commercial bank to the French importer.

German Commercial Banks: Claims on Chase decrease by \$ 90 while Euro-dollars.

Money supply in the U.S. remains constant.

Money supply in Germany remains constant.

Balance of payments of the U.S. is unaffected.

Balance of payments of Germany has a capital outflow in the form of loans to foreigners (French) and an inflow as deposits at Chase decrease-no net effect.

The French balance of payments has a capital inflow as resident has increased its debts and an outflow as the foreign assets have increased – no net effect.

Transaction No. 4.

Chase: There is only a transfer in ownership of deposits from the French importer to the German exporter.

Importer and Exporter: Have their debt cancelled by the acquisition of the German exporter of dollar balances.

Money supply in U.S. and Germany remain constant.

Balance of payments of U.S. is unaffected.

Balance of payments of France and Germany has similar effects to the ones described in Transaction 3.

Transaction No. 5.

Chase: There is only a transfer in ownership of deposits.

German Exporter: A change in type of assets.

German Commercial Banks: Another Euro-dollar deposit has been created.

Money supply in U.S. remains unaffected.

Money supply in Germany has increased by the size of the new Euro-dollar deposit.

Balance of payments of U.S. is unaffected.

Balance of payments of Germany is unaffected.

Transaction No. 6.

Chase: There is only a transfer of ownership in the deposits.

German Commercial Banks: Decreases its claims on Chase, but increases its claims on Citibank by a fraction of their Euro-dollar balances.

Citibank: It has acquired a claim on chase, and a Euro-dollar debt.

Money supply of U.S. and Germany remain constant.

Balance of payments of both countries which can now be lent.

Transaction No. 7.

Chase: It has \$81 of excess reserves which can now be lent.

Money supply in U.S. remains constant as the deposits created by Citibank are really at the expense of the deposits and loans that Chase gave up.

Balance of payments remains unaffected.

3. XYZ Trading Co., of the United Kingdom receives \$1,000,000 in payment for exports to ABC Electronic of Philadelphia, Pa. (XYZ Co. banks with Barclays-London, and ABC banks with Philadelphia Security Bank S_0 $\$/\pounds = 1.25$.)

- a) XYZ Trading Co. keeps amount in deposit in Philadelphia Security Bank.
- b) XYZ Trading Co. asks its bank to transfer export proceeds to its account in pounds sterling.
- c) Instead of (b), XYZ Trading Co. transfers dollar proceeds from Philadelphia Security Bank, and places it with its own bank as a time deposit denominated in dollars.

Show the above transactions in T accounts of Barclays and Philadelphia Security Bank.

QUESTIONS

1. Outline the major factors that have been responsible for the growth in the Eurocurrency markets, particularly the Eurodollar component of these markets. Which of these factors are still significant in fostering the use of these markets by investors and borrowers?
2. Under what circumstances would a financial manager of an MNC consider using Eurocurrency markets? What advantages or special features can these markets offer compared to borrowing from domestic markets? Are there drawbacks? Explain.
3. Is there a multiplier process in the placement of Eurocurrency deposits and subsequent Eurocurrency loans granted by financial institutions which receive these deposits? What are the major factors determining the size of the multiplier coefficient?
4. There are several methods of measuring the size of the Eurocurrency market. Comment on this statement and list the reasons for these different measurements.
5. Why are Eurocurrency deposit rates closely related to rates obtainable on instruments of corresponding maturity in home money markets? For example, why is the overnight Eurodollar rate closely aligned to the federal funds rate in the U.S. money market? Why is the former deposit rate usually (but not always) higher by some 25 to 50 basis points than the latter?
6. What is LIBOR? What determines the spread over LIBOR charged borrowers for Eurocurrency credits and loans?
7. Discuss the major advantages which the syndicated Eurocurrency loan market offers to lenders and borrowers, compared to domestic lending operations. Why is the quoted rate (spread over LIBOR) not an accurate indicator of the cost of a typical syndicated Eurocurrency loan?
8. List the major factors that are responsible for the growth of the international bond market. Indicate which of these factors (or other considerations) explain the large number of innovations in this market.
9. Distinguish between a Eurobond and a foreign bond. List the major participants in this market. Why does the share of developing countries in this market remain fairly modest?
10. Define (a) a multiple-currency Eurobond, (b) a dual – currency convertible bond, and (c) a floating-rate Eurocurrency note. Explain in each case the distribution of risk (the exchange rate risk or the interest rate risk) between the lender (investor) and the borrower (issuer).
11. How do you explain the yield differentials among Eurobonds dominated in different currencies? Does interest parity operate in the capital market (as it does in the international money market) to eliminate these differentials on a covered basis? Do you expect an alignment between the yield on a Eurodollar bond and a dollar bond of the same risk grade and maturity?

LEARNING UNIT - VII

International
Financial Management

[Instructions to Faculty]

Administrative Training Institute
Lalithamahal Road, Mysore - 570 011

Learning Unit 7

Instructions to faculty

F. International Financial Management

General:

1. This subject may be totally new to most participants. Even persons with economics background may feel uncomfortable. Therefore, while administering this learning unit, faculty may ensure that they are:
 - a. Explicit about the objectives of the learning unit
 - b. Make a comprehensive presentation on the fundamental principles relating to International Financial Management using the material provided in visual aids Nos. 47-52 given below.
 - c. Ensure that they explain the concepts with simple examples; faculty may avoid the difficult mathematical concepts while transacting the unit.
 - d. Make reference to the Guide to Learning Activity provided for this unit.

Presentation on objectives of the unit:

2. Faculty may begin with a brief presentation on the objectives of the learning unit, which may include, inter alia, the following points:
 - Enable participants to acquire the ability to read and understand statements of balance of payments
 - Acquire skills of conversion rates, by bid price, ask price and spread price.
 - Work out arbitrage possibilities.
 - Calculate expected exchange rate.
 - Understand various exchange rate theories.
 - Work on 'covering exchange rate risk' with reference to appreciation, depreciation, hedging and translation exposure.
 - Calculate the interest rate risk under different situations
 - Make recommendations on procurements, manufacturing and viability based on the case studies.
3. After the initial presentation on the objectives, faculty may make a more detailed presentation on the fundamentals of International Financial Management as per the visual aids Nos. 47-52. Faculty will also need to refer extensively to the reading material provided for this learning unit.

Visual aid 47 – Balance of Payments

Balance of Payments

- Exports of Goods and services
- Sale of existing foreign financial assets
- Foreign loans and borrowings
- Imports of goods and services
- Purchase of foreign financial assets
- Foreign lendings
- Foreign direct investment
- Private short term capital flows
- Official reserves account
- Impact of domestic savings, consumption

Faculty will need to refer extensively to the reading material provided for this learning unit

Visual aid 48 – Monetary system

Monetary system

- IMF: Capital resources, activities, financing facilities
- System of Bretton woods
- IBRD
- Exchange rate system
- Fixed exchange rate; floating exchange
- Context of international trade with reference to liquidity, adjustment and stability
- Evaluation of international market system.

Faculty will need to refer extensively to the reading material provided for this learning unit

Visual aid 49 – Foreign exchange market

Foreign exchange market

- Genesis of foreign exchange market
- Stakeholders in foreign exchange markets
- Quotings in foreign currencies
- Two-way quote: spread and cross rates
- Settlements: cash, spot, premium, discount

Faculty will need to refer extensively to the reading material provided for this learning unit

Visual aid 50 – Exchange rate theories

Exchange rate theories

- Factors affecting exchange rate
- PPP theory, fluctuations in exchange rate: ER index
- IRP: relation between nominal interest rate, rates of inflation, and future spot ER
- Link between BoP and ER
- Forecasting ER in short, medium and long term

Faculty will need to refer extensively to the reading material provided for this learning unit

Visual aid 51 – Risks in international operations

Risks in international operations

- Risks as an inherent factor in the businesses of MNCs
- Transaction exposure: consolidation exposure; economic exposure
- Hedging; choice of currency of invoicing, leads and lags, indexation clauses in contracts; netting
- Covering risk in the forward market
- Advances in foreign currency
- Covering in financial futures market
- Covering in the options market
- Covering in the currency swaps
- Interest rate risk; its measurement, futures, protection, options market, OTC
- Political risk and its evaluation.

Faculty will need to refer extensively to the reading material provided for this learning unit

Visual aid 52 – Investments and market structures

Investments and market structures

- Theories based on market structures: theory of product cycle, Hymer's theory of imperfect markets, eclectic theory
- Advantages and disadvantages of international license agreements
- Technical and commercial side of international franchise agreements
- Turnkey projects; specific contracts, direct investments
- Evaluation of cash flows
- Access to foreign financial markets

Faculty will need to refer extensively to the reading material provided for this learning unit

Group Activities

After making a comprehensive presentation based on the above points, faculty should divide participants into four groups for group activities described in the handout on Group Activities for Learning Unit 7.

The Group Activities include discussion and solutions to 15 specific problems, which the groups are required to address in the following groups:

- | | |
|----------|----------------|
| Group A: | Problems 1-4 |
| Group B: | Problems 5-8 |
| Group C: | Problems 9-12 |
| Group D: | Problems 13-15 |

After the presentations on the problems mentioned above, all participants will be required to study the issues raised in two case studies on 'Guns' and 'Helicopters', which are also given in the handout on Group Activities for Learning Unit 7.