GAUHATI UNIVERSITY

INSTITUTE OF DISTANCE AND OPEN LEARNING

STUDY MATERIALS

PGDBFS [18-PAPER-I]

Bank Financial Management

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Content

Unit I:

- Nature of Accounting
- Conceptual bases of accounting
- Types of account
- Double Entry System
- Journal Entries
- Books of accounts

Unit II:

- Profit and Loss account of a bank
- Balance Sheet of a bank
- Balance Sheet Items
- Capital Adequacy Norms

Unit III:

- Ratio Analysis
- CAMEL Model
- Cash Reserve Ratio
- Statutory Liquidity Ratio
- Net Demand and Time Liabilities

Unit IV:

- Source of Finance in Banks
- Equity Capital:
- Preference Capital
- Debentures
- Types of Deposits

Unit V:

- Uses of Funds
- Loan Pricing:
- Additional Methods Of Loan Pricing:
- Investments:
- Valuation Of Investments
- Non-Performing Investments
- Income Recognition:

Unit VI:

- Features of Bank's Capital Structure
- Capital Structure and Risk Insolvency
- Different risk: Liquidity risk
- Credit risk
- Interest rate risk
- Exchange risk and
- Other non-financial risk

Unit VII:

- The Time Value Of Money:
- Future Value Of A Single Amount:
- Present Value Of A Single Amount:
- Present Value Of An Uneven Series:
- Future Value Of An Annuity:

Unit VIII:

- Capital Investment Decision:
- Project Appraisal Techniques
- Pay Back Method:
- Average Rate Of Return:
- Net Present Value Method (NPV:
- Modified Net Present Value:
- Benefit Cost Ratio:
- Internal Rate Of Return (IRR):

Unit IX:

- Introduction
- Management Of Float:
- The Working Funds Approach:
- Cash Flow Approach:
- Cash Demand Forecasting:
- Time Series Analysis Of Cash Withdrawals From ATMs:
- Judgmental Analysis Of Demand Forecasting Of Cash By Banks:
- Cash Management At ATMs:

Unit X:

- Derivatives
- Types of Derivatives
- Advanced Risk Management Technique
- Basel Guidelines

UNIT I

Learning Objectives: This unit aims to provide the students with an introduction to the basic concepts of Accounting. After going through Unit I, students will be able to learn the following concepts:

- Nature of Accounting
- Conceptual bases of accounting
- Types of account
- Double Entry System
- Journal Entries
- Books of accounts

1.1 Introduction:

Accounting is the art of recording and reporting economic data. The users should be able to interpret and understand the data properly. Accounting requires a systematic record keeping of all that happens on day-to-day basis in business. The records are analyzed to understand the financial status of the business and these help in decision-making. This process of accounting involves recording, classifying and summarizing past events and transactions of financial nature, with a view to enabling the user of accounts to interpret the resulting summary.

However, there is a difference between the terms 'accounting' and 'bookkeeping'. Bookkeeping is merely concerned with orderly record keeping, whereas accounting is the process of identifying, measuring and communicating economic information, for decision-making by the user.

1.1.1 Objectives of Accounting

The following may the objectives of Accountancy: -

i) It is a process of recording the monetary transactions and events.
ii) It ascertains the earnings of the company, which is achieved by the preparation of Profit and Loss Account.
iii) It is required to identify the assets and resources of the organization.
iv) Accounting records are required to be maintained statutorily by certain government and regulatory bodies.
v) Accounting records are also required by the management for taking the financial decisions.

1.2 Conceptual Basis of Accounting

Accounting concepts are formed primarily by observation and are established through agreement. In formulating the GAAP, the three conventions namely, **relevance, objectivity and feasibility** are followed.

i) ***Business Entity***: The concept of a separate business entity means that the entity is separate and distinct from the owners and the entity is liable to be owner. According to this concept when the owner brings capital into the business, the business in turn is deemed to owe the capital to the owner.

ii) ***Going Concern***: A business entity is assumed to carry on its operations forever, that is, a life of infinite duration. The very categorization of assets into 'fixed' and 'current' presupposes the going concern concept.

iii) ***Monetary Expression in Accounts***: Monetary expression is used as a means of converting qualities and/or quantities to a common denomination. Accounting measures business transactions only in terms of money.

iv) ***Duality or Accounting Equivalence Concept***: In a business, funds can be raised by capital loans and revenue earning, profits and disposing assets. Thus all increases in liabilities (including owners' equity) and reduction in assets represent sources of funds.

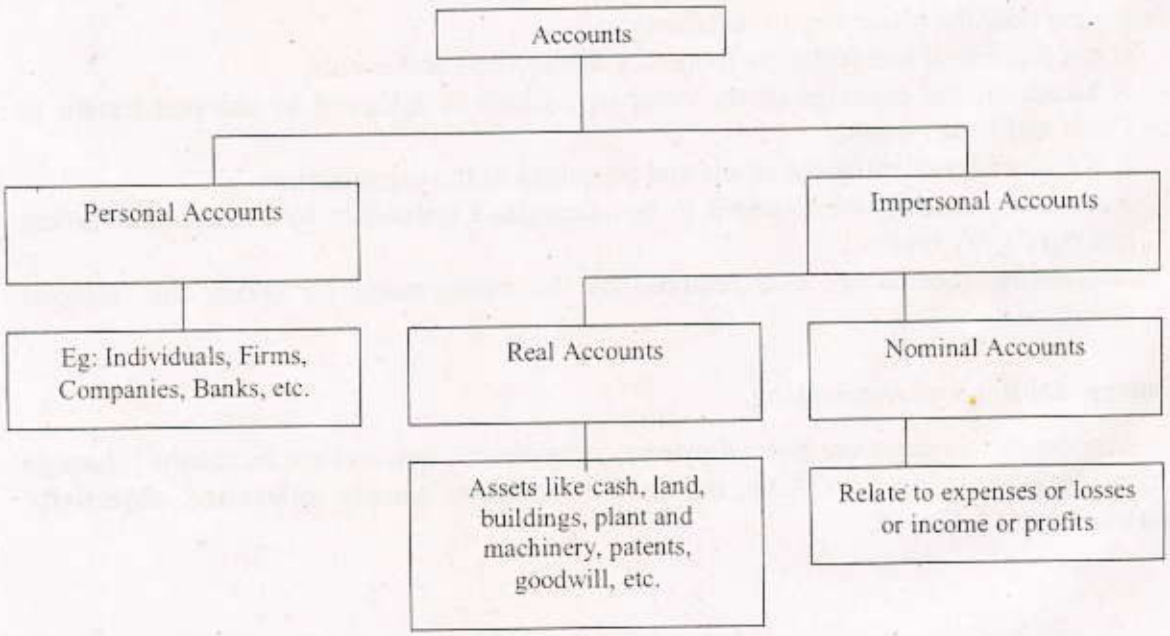
v) ***Matching Concept***: In order to determine the profits or losses occurred in an accounting period, the expenses must relate to the goods or services sold during the period.

vi) ***Realisation Concept***: This concept deals with the point in time at which revenue may be deemed to be realized or when a sale can be said to have taken place. The recognition of revenue has nothing to be with the receipt of cash, the revenue and hence profits are recognized only at the point of sale, when the ownership is passed on to the buyer.

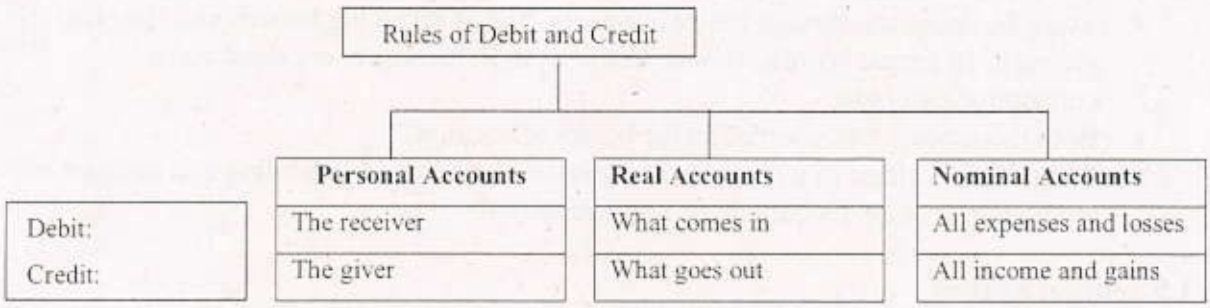
vii) ***Matching Concept***: This concept is used for determining the profits after charging the expenses of a period with the revenues earned in the same period. To determine the profits or losses accrued in an accounting period, the expenses must relate to the goods or services sold during the period. The 'cost' derives its relevance only from the 'sale' and not vice versa.

1.3 TYPES OF ACCOUNTS:

The accounts maintained by a business organization are classified into three types as shown below-



- **Personal Account**: It deals with accounts of individuals like creditors, debtors, bank, etc. it shows the balance due to these individuals or due from them on a particular date.
- **Real Account**: It represents assets like plant and machinery, land and buildings, goodwill, etc. As on a particular date, this account shows the worth of the asset.
- **Nominal account**: it consists of different types of expenses or incomes or loss or profit. These accounts show the amount of income earned or expenses incurred for a particular period say a month, a year, etc.
- Whether an account has to be debited or credited is decided by using the rules indicated in the following **Figure 1**-



1.4 DOUBLE ENTRY SYSTEM:

The single entry system appears to be time saving and economical but it is unscientific as under this system some transactions are not recorded at all whereas some other transactions are recorded only partially. Under double entry system of book-keeping, both the aspects of each and every transaction are recorded. This is known as dual aspect analysis. Under the single entry system, only one aspect of the transaction, i.e. personal is recorded and the other aspect is ignored.

On the other hand, the double entry system is based on scientific principles and is, therefore, used by most of the business houses. The system recognizes the fact that every transaction has two aspects and records both aspects of each and every transaction. Under this system, in every transaction an account is debited and some other account is credited. In accountancy, to debit an account means to record the transactions on the left hand side on an account, which receives the benefit. Left hand side of the account is also called debit side. It is abbreviated as 'Dr.' the word 'debit' originated from the latin word 'Debitum'. It means what is due.

In accountancy, to credit an account means recording the transactions on the right hand side of an account which imparts the benefit. Right hand side of the account is also called Credit side. It is abbreviated as 'Cr.'. The word 'Credit' originated from the latin word 'Credre' which means trust or belief.

Name of the account

Dr. Cr.

An account is vertically divided into two halves just like the English alphabet 'T'. the left hand side is called the 'debit side'. It is indicated by the word 'Dr.' on the left hand top corner.

The right hand side is known as the 'credit side' and indicated by 'Cr.' on the right hand top corner of the account. The name of the account, i.e. xyz a/c is written at the top in the center.

The following are the main principles of double entry system:

- For every transaction two parties must be interested.
- Every business transaction has two aspects, one of receiving benefit and the other of giving it. In simple words, 'double entry' system means 'every debit has a corresponding credit'.
- Both the aspects are recorded in the books of account.
- The two-fold effect of a business transaction is recorded by debiting one account and crediting the other account at the same time.

1.5 Journal Entries

All the transactions that occur are written as and when they occur as per the documents, vouchers or papers relating to them. The primary record of transaction is the journal. A journal is a chronological record of all transactions showing the debit and credit of the accounts as affected by the transactions. Debit-Credit rules are accepted everywhere as accounting conventions that facilitate double-entry bookkeeping. The basic of the double-entry bookkeeping system is the rule that for every debit there must be a corresponding credit .All transactions are recorded by the following debit-credit rules.

Debit-Credit Rules		
Item	Debit	Credit
Assets	Debit an asset account for increase in the carrying amount.	Credit an asset account for decrease in the carrying amount.
Liability	Debit a liability for decrease in the carrying amount.	Credit a liability account for increase in the carrying amount.
Equity	Debit an equity account for decrease in the carrying amount.	Credit an equity account.

Steps in Journalizing

- Analyze the transaction and identify the two accounts that are being affected by it.
- Ascertain the nature of the accounts involved as real, personal or nominal.
- Determine which rule of debit and credit is applicable to each of the accounts involved.

- Ascertain the accounts to be debited and the account to be credited.
- The account to be debited is written an abbreviation "Dr" on the same line against the name of the account in particular column and the amount to be debited in the debit column against the name of the account.
- The name of the account to be credited is written in the next line preceded by the word "To" at a few spaces towards the right in the particular column, and the amount to be credited in the credit amount column against the name of the account.
- A narration of the transaction needs to be written within brackets in the next line.

Illustration 1:Journalise the following transactions in the books of MP Enterprises.

February 1 Started business with a capital of Rs.7,50,000

1. Opened a bank account with State Bank of India for Rs. 2,00,000.
2. Purchased goods from Ravi & Co. for Cash Rs. 1,00,000.
3. Purchased goods from Barman for Rs. 2,00,000.
4. Goods returned to Mr. Barman Rs. 50,000.
5. Paid Rs. 1,40,000 to Mr. Barman in full statement of his dues.
6. Paid Mr. Dhaniram, the landlord Rs. 50,000 towards return.
7. Withdrew cash for household expenses Rs. 60,000.
8. Sold goods to Mrs. Kalita for cash Rs. 2,50,000.
9. Sold goods to Mr. Dev on credit Rs. 1,00,000.
10. Goods returned by Mr. Dev for Rs. 25,000.
11. Received cash from Mr. Dev Rs. 70,000 in full settlement.
12. Paid cartage on goods purchased Rs. 35,000.
13. Paid cartage on goods sold Rs. 80,000.
14. Purchased furniture for office purposes Rs. 1,00,000.
15. Purchased furniture for re-sale Rs. 1,00,000.
16. Sold furniture out of those meant for resale Rs. 1,50,000.
17. Paid rent out of personal cash Rs. 40,000.

Solution:

Date Feb.	Particulars	L.F	Debit Rs.	Credit Rs.
I.	**Cash A/c Dr.** **To Capital A/c** **(Being cash invested in the business)**		7,50,000	7,50,000
1	**Bank A/c Dr.** **To Cash A/c** **(Being cash deposited in the bank)**		2,00,000	2,00,000
2.	**Purchases A/c Dr.** **To Cash A/c** **(Being goods purchased from Ravi & Co. for cash)**		1,00,000	1,00,000

3.	Purchases A/c Dr. To Barman A/c (Being goods purchased from Mr. Barman on credit)		2,00,000	2,00,000
4.	Barman A/c Dr. To Returns outward A/c (Being goods returned to Mr Barman)		50,000	50,000
5.	Barman A/c Dr. To Cash A/c To Discount Received A/c (Being cash paid to Mr. Barman and received discount)		1,50,000	 1,40,000 10,000
6.	Rent A/c Dr. To Cash A/c (Being rent paid in cash)		50,000	50,000
7.	Drawings A/c Dr. To Cash (Being cash withdrawn for household expenses)		60,000	60,000
8.	Cash A/c Dr. To Sales A/c (Being goods sold for cash)		2,50,000	2,50,000
9.	Dev A/c Dr. To Sales A/c (Being goods sold to Mr. Dev on credit)		10,000	1,00,000
10.	Returns Inward A/c Dr. To Dev A/c (Being goods returned by Mr. Dev)		25,000	25,000
11.	Cash A/c Dr. Discount A/c Dr. To Dev A/c (Being cash received from Mr. Dev and allowed him discount)		70,000 5,000	 75,000
12.	Cartage Inward A/c Dr. To Cash A/c (Being cartage paid on goods purchased)		35,000	35,000
13.	Cartage Outward A/c Dr. To Cash A/c (Being cartage paid on goods sold)		80,000	80,000
14.	Furniture A/c Dr. To Cash A/c (Being furniture purchased by cash for office)		1,00,000	1,00,000
15.	Purchases A/c Dr. To cash A/c (Being furniture purchased by cash for re-sale)		1,00,000	1,00,000
16.	Cash A/c Dr. To Sale A/c (Being furniture meant for resale sold for cash)		1,50,000	1,50,000
17.	Rent A/c Dr. To Capital A/c (Being rent paid out of personal cash)		40,000	40,000

2.Journalise the following transactions in the books of M/s Fasthouse:

		Rs.
2007 February	1 Commenced business with cash Rs 14,000 and furniture	2,000
	5 Received goods from M/S Suresh on credit	12,000
	8 Made cash sales	5,000
	12 Invoiced goods to Ramesh Mill	2,000
	13 Received free sample	400
	18 Placed an order with MMT for goods	5,000
	20 Returned goods to Suresh	500
	25 MMT sent their invoice	2000
	28 Goods withdrawn for personal use	500

3.Record the following transactions in the books of Hari Verma:

		Rs.
2007 January	1 Cash paid into Bank	20,000
	5 Purchased Goods from Chandimall at 10% trade discount	40,000
	8 Purchased a typewriter	3,000
	10 Paid salary to the accountant	500
	15 Cash sales made	12,000
	18 Paid for advertisement	2,000
	20 Settled the account to Chandimall by issuing a cheque to him. He offered a cash discount of 10%	
	28 Paid household expenses	1,500
	30 Paid office rent	200

1.6 Journal Entries related to bank transactions:

i) **Cash received for the credit of an account of the customer**

Cash Account..... ..Dr
To Head of Customer's Account
(For example, Current A/c, RD A/c, etc.)

ii) **Cash withdrawn from banker's account**

Cash Account.....Dr
To Banker's Account

iii) **Cash received for purchase of DD**

Cash Account.....Dr
To New DDs Account
To Commission Account

In case the remittance for purchase of DD is received in cheque, the entry to be passed is

Drawer's account (SB/Current A/C/OD).....Dr
To New DDs Account
To Commission Account

Exercise 1:Journalise the following transactions:

		Rs.
2007	1 Commenced business with cash	5,000
January	2 Cash deposited in Dena Bank to open an a/c	1,000
	4 Purchases goods from Amita on credit	16,000
	5 Sold goods to BPC on credit	2,000
	9 Bought furniture from Godrej & Boyce and amount paid by cheque	3,000
	12 Cash sales made	5,000
	18 Paid rent	500
	25 Purchased stationery for office use	200

rightly said, "Ledger is the permanent store house of all the transactions." Thus Ledger is a book which contains records of all transactions permanently in a summarized and classified form. It is the book of final entry and is the principal book of accounts. A Journal fails to give a complete information regarding an account at a glance at a particular point of time because of the scattered entries of the transactions in different pages. This limitation has developed the ledger. The ledger brings together these different entries regarding an account from the Journal to a place in a summarized form and gives a complete picture including its final position at a glance. Thus the ledger can be said to be the book of final entry in which a record of the debits and credits to the various accounts are kept. It is a group of accounts and not an independent record.

1.8 Accounting Procedures in Banks

The accounting system of a bank is different from that of a manufacturing and other service organizations. As a bank handles a large amount of cash, so the trial balance is daily extracted in bank unlike other business organization. The main features of a bank's accounting system are given below:

- Entries in the personal ledgers are made directly from the vouchers.
- The general ledger trial balance is extracted and tallied every day.
- The entries in the ledgers are checked by persons other than those who made the entries in order to avoid mistakes.
- Two vouchers, one debit voucher and another credit voucher are prepared for every transaction not involving cash.

1.8.1 Books of Accounts

Books of account of a bank can be classified as the Principal Books of Accounts, Subsidiary Books, Other Subsidiary Registers , Other Memoranda Books and Statistical Books.
The principal books of accounts of a bank consist of the General Ledger and the Profit and Loss ledger.

- **General Ledger**: It contains all personal ledger accounts, profit and loss accounts and different asset accounts. The balance sheet can be readily prepared from the general ledger.
- **Profit and Loss Ledger**: Some banks maintain separate profit and loss accounts other than the one maintained in the general ledger. These are columnar books having separate columns for each revenue or expense head. Postings are made directly from the vouchers.
- **Personal Ledger:** For different types of accounts, banks keep separate ledgers, like
  Receiving Cashier's Counter Cash Book
  Paying Cashier's Counter Cash Book
  Current Accounts Ledger
  Saving Bank Accounts Ledger
  Fixed Deposit Accounts Ledger
  Investment Ledger
  Bills Discounted and Purchased Ledger
  Loan Ledger

4. Journalise the following transactions:

		Rs.
2007 March	1 Started business with goods worth Rs. 7,000 & cash	5000
	5 Cash received from Maganlal as a loan	10000
	6 Opened a bank account with Bank of India	5000
	8 Bought furniture from Suresh Furniture Mart	6000
	9 Bought goods for cash less 5% cash discount	2000
	12 Sold goods to Banwarilal	6000
	15 Banwarilal returned $1/4^{th}$ of the goods sold to him	
	18 Miscellaneous expenses paid in cash	500
	20 Received a cheque from Banwarilal	3000

5. Journalise the following transactions in the books of Suresh

		Rs.
2007 February	1 Suresh commenced business with cash	20,000
	5 He opened an account with Dena Bank	15,000
	3 Bought goods for cash from Nayan	2,000
	6 Bought goods from Ayub	10,000
	8 Sold goods to Kavita	12,000
	9 Settled account of Ayub by cheque at 5% cash discount	
	12 Kavita gave us a cheque in full settlement of our account	10,000
	15 Drawn cash from bank for office use	2,000

1.7 Ledger Account:

Ledger is a book of account, which contains in a suitably classified form, the final and permanent record of traders' transactions. It is essentially a collection of five types of accounts – Assets, Liabilities, Capital, Revenue and Expenses. Arther Fieldhouse has

3) *Mail Transfers*: The mail transfers are issued by any of the branches of a bank for transfer of funds between branches through post offices either for credit of an account holder or for payment to a certain beneficiary.

Suggested Exercise

1) Explain the importance of Accounting.
2) How Journals help in keeping bank records?
3) Write note on books of accounts of a bank.
4) Journalise the banking transactions:

(i) Cash received for credit of income/ expenditure account , say locker rent.
(ii) Cash withdrawn from banker's account.
(iii) Remmittance received towards Accounting heads maintained under Sundry Assets.

Cash Credit Ledger
Customer's Acceptances, Endorsements and Guarantee Ledger
Receiving Deposits Accounts Ledger

- **Bills Registers** : Bills like bills purchased, inward bills for collection, outward bills for collection are entered on day –to-day basis in separate registers. Entries in the register are made from the original document.
- **Other Subsidiary Registers**: Depending upon the allied services provided by a bank, additional registers are maintained by a bank. For example, Jewelry Register, Lettter of Credit Register , Share Security Register are subsidiary registers.
- **Other Memoranda Books**: The various departments of a bank maintain a number of memoranda books to facilitate their work. The Cash Department maintains Receiving Cashier's Cash Book, Paying Cashier's Cash Book, Main Cash Book and Cash Balance Book.
- **Statistical Books**: Statistical records are kept by the banks as per their requirements. Some of the common books are:

  Average balances in loans and advances
  Deposits
  Number of cheques paid
  Number of cheques, bills and other items collected.

Special Transactions of Banks

1) *Cash Credit and Overdraft*: It is an arrangement by which the customer is granted the right to borrow money from time to time up to a certain limit.
2) *Discounting of Bills*: When the payment is made on a bill before the maturity date of the bill, it is called Discounting of Bills. While making payment the bank deducts an amount for the un-expired period for the amount of the bill discounted. The bank keeps the bill with it till the maturity date and gets its payment for the customer on the due date.
3) *Documentary Bills*: These bills are secured as these are supported by documents like bills of lading, insurance policy, etc.
4) *Clean Bills*: These are unsecured bills as no documents like bill of lading, insurance policy are attached to it.
5) *Interest Suspense Account*: As per prudential norms, a bank cannot account for interest accrued on non-performing loans as its revenue. All interest, which is not received in cash is credited in the Interest Suspense Account.

1.9 Instruments

1) *Demand Draft*: It is an instrument drawn by one branch of a bank on any other branch of the same bank with an unconditional order to pay on demand a specified sum of money to the named payee or his order.
2) *Banker's Cheque*: It is issued by the bank to customers for making local payments like payment of telephone/electricity bills, etc. These are valid for six months from the date of issue and may be revalidated in genuine cases.

Profit and Loss or Income Statement

Schedule	Income	Schedule	Expenses
13	Interest earned	15	Interest expended
14	Other income	16	Operating expenses

The following schedules are required to be furnished with the Balance Sheet:

Schedule 1: Capital

(i) For Nationalised Banks
Capital (Fully owned by Central Government) Rs

(ii) For other Banks:
Authorised Capital (.... Shares of Rs ....each)
Issued Capital (....Shares of Rs .... each)
Subscribed Capital (.... Shares of Rs .... each)
Paid-up Capital (....Share of Rs ....each)

Schedule 2: Reserves and Surplus **Rs**

(i) Statutory reserves
Opening Balance
Additions during the year
Deductions during the year

(ii) Capital Reserves
Opening Balance
Additions during the year
Deductions during the year

(iii) Share Premium
Opening Balance
Addition during the year
Deduction during the year

(iv) Revenue and Other Reserves
Opening Balance
Additions during the year
Deductions during the year

(v) Balance in Profit & Loss Account
Total (i+ ii +iii+iv+v)

Schedule 3: Deposits **Rs**

A. (I) Demand deposits
(i) From Banks
(ii) From Others
(II) Savings Bank Deposits
(III) Term Deposits
(i) From Banks
(ii) From others
Total (I,II,III)

UNIT II

Learning Objectives: This unit aims to provide the students with an introduction to the preparation of profit and loss account and balance sheet of a bank. After going through Unit II, students will be able to learn the following concepts.

- Profit and Loss account of a bank
- Balance Sheet of a bank
- Balance Sheet Items
- Capital Adequacy Norms

2.1 Introduction:

A bank's financial statements are different from that of a manufacturing or service company. The Banking Regulation Act gives the format of balance sheet and profit and loss account in which the accounts of bank should be presented and this format is given in the third schedule annexed to the Banking Regulation Act. The balance sheet of banking company is drawn up according to Form-A and profit and loss account has to follow Form-B given in the Third Schedule of the Banking Regulation Act. The Government has notified that accounts of the banking companies shall be closed on 31st March every year. Banks also close books on 30th September for internal purposes.

The banks operating in India have a uniform pattern of financial statement, as these are prepared according to the third schedule of section 29 of the Banking Regulation Act. A typical bank's balance sheet has 12 schedules, with Schedules 13 to 16 being allocated to the profit or loss or income statement. **The Balance Sheet and Profit and Loss Account** of an Indian bank is given below:-

The Balance Sheet

Schedule	Liabilities	Schedule	Assets
01	Capital	06	Cash and balances with RBI
02	Reserves & Surplus	07	Balances with banks and money at call and short notice
03	Deposits	08	Investments
04	Borrowings	09	Advances
05	Other liabilities and provisions	10	Fixed Assets
12	Contingent liabilities	11	Other Assets

(II) Investment outside India in

Total (I &II)

Schedule 9: Advances **Rs**

A. (i) Bills Discounted and Purchased

(ii) Cash Credits, Overdrafts and Loans payable on demand

(iii) Term Loans

Total

B. (i) Secured by Tangibles Assets

(ii) Covered by Bank/Govt. Guarantees

(iii) Unsecured

Total

C I. Advances in India:

(i). Priority Sectors

(ii). Public Sector

(iii). Banks

(iv). Others

Total

II. Advances Outside India:

(i) Due from Banks

(ii) Due from Others

(a) Bills Purchased and Discounted

(b) Syndicated Loans

(c) Others

Total

Schedule 10: Fixed Assets **Rs**

I. Premises

At cost as on 31st March of the preceding year

Additions

Deductions during the year

Depreciation to date

II. Other Fixed assets

At cost on 31st March of the preceding year

Additions during the year

Deductions during the year

Depreciation to Date

Total (I & II)

Schedule 11 : Other Assets **Rs**

I. Inter-office Adjustments(net)

II. Interest Accrued

III. Tax paid in Advance/Tax Deducted at Source

IV. Stationery and Stamps

V. Non-banking Assets acquired in satisfaction of claims

VI. Others(See note)

Total

B. (i) Deposits of branches in India
(ii) Deposits of branches outside India

Schedule 4: Borrowings

(I) Borrowings in India
(i). Reserve Bank of India
(ii). Other Banks
(iii). Other Institutions and Agencies
(II) Borrowings outside India
Total (I & II)
Secured Borrowings in I & II above

Schedule 5: Other Liabilities and Provisions **Rs**

(I) Bills Payable
(II) Inter-office Adjustments (net)
(III) Interest Accrued
(IV) Others (including provisions)
Total

Schedule 6: Cash and Balance with RBI

(I) Cash in Hand **Rs**
(II) Balances with RBI in:
Current Account
Other Accounts
Total (I &II)

Schedule 7: Balance with Banks & Money at Call and Short Notice **Rs**

In India
(I) Balance with Banks
(a) In Current Accounts
(b) In Other Deposit Accounts
(II) Money at Call& Short Notice
(a) With Banks
(b) With other Institutions
Total (I & II)

Outside India
(I) In current Accounts
(II) In other Deposit Accounts
(III) Money at call and short notice
Total (I + II + III)

Schedule 8: Investments

(I) Investments in India in **Rs**
i. Government Securities
ii. Other Approved Securities
iii. Shares
iv. Debentures and Bonds
v. Subsidiaries and/or Joint Ventures
vi. Others (to be specified)

2.2.2 Deposits: The primary source of borrowed funds for a typical bank is "deposits", raised from the public. Deposits are grouped for transactions and for balance sheet based on purposes and maturity. These are broadly classified as deposits payable on demand and deposits payable after a specified period. Deposits payable on demand are commonly known as "savings" and "current deposits" and deposits payable after a specified after a specified period are known as "term deposits". Normally the maturity period of "term deposits" range from 15 days to 10 years.

2.2.3 Borrowings: Banks can borrow from the markets, both domestic and overseas, other institutions and from central bank. Borrowings contribute a lower proportion to the banks' total sources of funds.

2.2.4 Other Liabilities and Provisions: They usually include items of short-term nature such as Bills Payable, Inter-office Adjustments ,Interest Accrued on deposits and borrowings, Provision for tax, bad debts fall under this head. Contingent Liabilities

2.2.5 Contingent liability of the bank includes,

a. All the uncovered foreign currency forward transactions
b. Guarantees
c. Acceptance, endorsement and letters of credit

2.3 ASSETS OF A BANK:

The asset composition of a bank is of crucial importance. A bank has to earn profit for its shareholders and at the same time satisfy the withdrawal needs of its customers. The various items are described below:

2.3.1 Cash: Cash –in –hand (also called vault cash) is held to meet the withdrawal needs of the depositors. Commercial banks also hold cash balances with RBI to meet the statutory "cash reserve ratio".

2.3.2 Money at Call/ Short Notice: Commercial banks lend their surplus cash to each other and also to other financial institutions for short periods of time. This helps the bank to earn interest and maintain liquidity at the same time.

2.3.3 Investments: Banks are required statutorily to invest a part of their assets in Government securities .RBI has given permission for investment in six different types, like the Government securities, Approved securities, Shares, Debentures and bonds, Subsidiaries and/or joint ventures and other investments. These securities carry a low rate of interest but banks can borrow from the RBI against these securities.

2.3.4 Loans and Advances: This category of assets is the most important for banks because it defines their roles as financial intermediaries and impacts their profitability to a large extent. These assets also carry a high level of default risk as each asset depicts unique characteristics like loan terms may vary in amount, price, source of repayment, use of loan amount or type of collateral.

2.3.5 Fixed Assets: Indian banks classify "fixed assets" on their balance sheets as Premise (including land), Other fixed assets (including furniture and fixtures) and Asset on lease.

Note: In case there is an unadjusted balance of loss, the same may be shown under appropriate footnote.

Schedule 12 : Contingent Liabilities **Rs**

I. Claims against the Bank not acknowledge as Debts
II. Liability for Partly paid investments
III. Liability on Account of Outstanding Forward Exchange Contracts
IV Guarantees given on Behalf of Constituents:
(i) In India
(ii) Outside India

2.2 BALANCE SHEET ITEMS

Balance sheet of a bank is a statement of liabilities and assets of a bank at a point of time .The liabilities indicate the sources of its funds. The assets indicate the composition of its investments.

Liabilities of a Bank: The liabilities of a bank are mainly composed of the following items.

2.2.1 Paid up Capital and Reserves: This means the amount of share capital actually contributed by the shareholders. The banking companies are required to maintain a minimum paid-up-capital and reserve as per the Section 11 of the Banking Regulation Act. An equal amount either in cash or in approved securities is to be deposited with the RBI, where the banking company is incorporated outside India. Following are the various important provisions related to the capital of the banking companies:

a. Subscribed capital should be more than 50% of its authorised capital
b. Paid-up capital should be more than 50% of its subscribed capital
c. Capital should include equity shares only, except in the case of preference shares issued prior to July 1st, 1944.
d. No person can exercise voting rights in excess of 10% of the total voting rights.

Reserves are retained earnings or undistributed profits of the banks. The paid-up capital and reserves constitute the owned funds of the bank and is also referred to as the networth.

The following items are required to be shown in details separately under this head:

1. ***Statutory Reserves***: This requires banks to set aside 20% of its net income to its reserve fund before the declaration of dividends or the transfer to central government. However, banks may be exempted from this, provided their reserve fund including share premium is at least equal to the paid-up capital. This exemption is totally at the discretion of central government.
2. ***Capital Reserves***: This includes funds created such as surplus on revaluation of fixed assets, etc. and it does not include any amount free for utilization through the profit and loss account.
3. ***Share Premium***: Any amount utilized by the bank from its share premium account has to be reported to the central bank within 21 days of such appropriation.
4. ***Revenue Reserve***: This includes reserves other than those discussed under the above heads. These are not capital in nature and include amount that is of recurring nature.
5. ***Balance of Profit***: In case, a bank incurs a loss, it may deduct the amount of such loss from the revenue reserves.

Schedule 13 – Interest Earned

		Year ended on 31.03..... (Current Year)	Year ended on 31.03..... (Previous Year)
I.	Interest/discount on advances/bills		
II.	Income on investments		
III.	Interest on balances with reserve Bank of India and other inter-bank funds		
IV.	Others		
	Total =		

Schedule 14 – Other Income

		Year ended on 31.03..... (Current Year)	Year ended on 31.03..... (Previous Year)
I.	Commission, exchange and brokerage		
II.	Profit on sale of investments		
	Less: Loss on sale of investments		
III.	Profit on revaluation of investments		
	Less: Loss on revaluation of investments		
IV.	Profit on sale of land, buildings and other assets		
	Less: Loss on sale of land, buildings and other assets		
	Profit on exchange transactions		
	Less: Loss on exchange transactions		
VI.	Income earned by way of dividends etc., from subsidiaries/companies and/or joint ventures abroad /in India		
VII.	Miscellaneous income		
	Total =		

Schedule 15 – Interest Expended

		Year ended on 31.03..... (Current Year)	Year ended on 31.03..... (Previous Year)
I.	Interest on deposits		
II.	Interest on Reserve Bank of India/inter-bank borrowings		
III.	Others		
	Total =		

2.3.6 Other Assets: This may include Interest Accrued on investments and advances, Inter-office Adjustments, Advance tax paid or tax deducted at source and accumulated losses.

2.4 ITEMS OF PROFIT AND LOSS ACCOUNT:

Form B in a summary form and the details of various items are given in the various schedules. The formats of profit and loss account cover all items likely to appear in these statements. In case a bank does not have any particular item to report, it may be omitted from the formats. Corresponding comparative figures for the previous year are to be disclosed as indicated in the formats. The words 'current year' and 'previous year' used in the formats are only to indicate the order of presentation and may not appear in the accounts. Form B of third Schedule of Banking Regulation Act 1949 is given as follows:

Form 'B'

Form of Profit and Loss Account

for year ended 31st March (Year) (000's omitted)

		Schedule No.	Year ended on 31.03.... (Current Year)	Year ended on 31.03.. (Previous Year)
I.	**Income**			
	Interest earned	13		
	Other income	14		
	Total =			
II.	**Expenditure**			
	Interest expended	15		
	Operating expenses	16		
	Provisions and contingencies			
	Total =			
III.	**Profit/Loss**			
	Net Profit/Loss (-) for the year			
	Profit/Loss (-) brought forward			
	Total =			
IV.	**Appropriations**			
	Transfer to statutory reserve			
	Transfer to other reserves			
	Transfer to Government/Proposed dividend			
	Balance carried over to balance sheet			
	Total =			

2.5.1 Movement of provisions held towards NPA

Particulars	As on 31.3.200X	As on 31.3.200X
Opening Balance		
Add; Provisions made during the year		
Sub-total		
Less: Write off of bad debts/write		
Back of excess provisions		
Closing Balance		

2.5.2 CAPITAL ADEQUACY NORMS

The Capital Adequacy Ratio is the ratio of the bank's capital to its risk weighted assets. To assess the capital adequacy of banks based on this ratio it is essential to understand three aspects:

1. Composition of Capital
2. Composition of Risk Weighted Assets
3. Assigning Risk Weights

Tier-I Capital

For Indian Banks, it consists of:

- Paid-up capital
- Statutory reserves
- Disclosed free reserves
- Capital reserves representing surplus arising out of sale proceeds of assets.

Equity investment in subsidiaries, intangible assets, and losses in the current period and those brought forward from previous periods, will be deducted from Tier-I capital.

Tier-II Capital

Tier-II capital for both Indian and foreign banks consists of the following:
Undisclosed reserves and cumulative perpetual preference shares often have characteristics similar to equity and disclosed reserves. These elements have the capacity to absorb expected losses and can be included in capital, if they present accumulations of post-tax profits and not encumbered by any known liability and should not be routinely used for absorbing normal loan or operating losses. Cumulative perpetual preference shares should be fully paid-up and should not contain clauses, which permit redemption by the holder.

2.6 ILLUSTRATIONS:

The following trial balance was extracted from the books of Bank of Madurai Limited. You are required to prepare the **profit and loss account for the year ended 31st March, 200X** and the **balance sheet** as on that date along with the necessary schedules after taking into consideration the additional information.

Schedule 16 – Operating Expenses

		Year ended on 31.03..... (Current Year)	Year ended on 31.03..... (Previous Year)
I.	Payments to and provisions for employees		
II.	Rent, taxes and lighting		
III.	Printing and stationary		
IV.	Advertisement and publicity		
V.	Depreciation on bank's property		
VI.	Directors' fees, allowances and expenses		
VII.	Auditors' fees, allowances and expenses (including branch auditors)		
VIII.	Law charges		
IX.	Postages, telegrams, telephones, etc.		
X.	Repairs and maintenance		
XI.	Insurance		
XII.	Other expenditure		
	Total =		

2.5 DISCLOSURES REQUIREMENTS OF BANKS TO BE ADDED AS NOTES TO ACCOUNTS(IN SCHEDULE 17) :

In addition to the above requirements, some other ratios are also required to be disclosed in the 'Notes on Accounts'. These are as under:

- Capital Adequacy Ratio
- Capital Adequacy Ratio – Tier-I Capital
- Capital Adequacy Ratio – Tier-II Capital
- Proportion of government share holding in the nationalized banks
- Proportion of Net NPAs to net advances
- Interest income as a percentage of working funds
- Non-interest income as a percentage of working funds

Investments in other approved securities	3,78,04
Investments in shares	15,60
Investments in debentures and bonds	15,17
Bills purchased and discounted	2,18,53
Cash credits and overdrafts	9,97,68
Term loans	8,01,24
Stationary and stamps	1,42
Total	47,37,58
Credit Balances	
Paid-up share capital	
2,50,000 shares of Rs. 10 each	25,00
Statutory Reserve	75,10
Revenue Reserve	55,00
Demand deposits	11,14,30
Savings bank deposits	11,86,05
Term deposits	15,65,20
Interest accrued	12,56
Interest/discount on advance/Bills	3,11,43
Rebate on bills discounted	33,03
Income on investments	1,43,62
Invest on balances with RBI and other interbank funds	34,47
Commission, exchange and brokerage	50,52
Profit on sale of investment	1,75
Profit and loss account	35,00
Depreciation on premises (to date)	1,10
Depreciation on other fixed assets (to date)	9,70
Borrowing from Reserve Bank of India	29,00
Bills Payable	54,75
Total	47,37,58

Trial Balance as on 31st March, 200X	Rs. In '000
Debit Balances	
Cash in hand	21,14
Balance with RBI	
In current account	7,50,02
In other accounts	9,85
Balance with other banks in current accounts	8,24
Money at call and short notice with banks	25
Permits at cost on 31-3-x0	3,61
Other Fixed assets at cost on 31-3-x0	18,90
Interest accrued	25,60
Interoffice adjustments (net)	12,74
Tax paid in advance	72,21
Non-banking assets acquired in satisfaction of claims	5,00
Loss on revaluation of investments	2,15
Interest paid to deposits	2,28,03
Interest on RBI borrowing	4,45
Payment to and provision for employees	1,11,82
Directors' fees and allowance	3,48
Auditors' fees and expanses	16,88
Rent, taxes and lighting	6,95
Printing and stationary	1,86
Advertisement and publicity	40
Depreciation on bank's property	2,71
Repairs and maintenance	1,16
Insurance	9,35
Law charges	20
Postage, telegrams, telephones etc.,	2,23
Other expenditure	7,15
Investment in Government Securities	9,83,52

Bank of Madurai Ltd.

Profit and Loss Account for the year ended 31.3.20x1

		Schedule	Rs.'000
	Income		
I	Interest earned	13	4,89,52
	Other income	14	50,12
	Total		5,39,64
	Expenditure		
	Interest expended	15	2,32,48
II	Operating expenses	16	1,64,19
	Provision and Contingencies		73,89
	Total		4,70,65
	Profit		
III	Net profit of the year		68,99
	Profit brought forward		35,00
	Total		1,03,99
	Appropriation		
IV	Transfer to Statutory reserve		13,80
	Balances carried over to balance sheet		90,19
	Total		1,03,99

Schedule 1-Capital

	Rs.'000
Authorized Capital 5,00,000 shares of Rs. 10 each	50,00
Issued, Subscribed, Called-up and Paid-up Capital 2,50,000 shares of Rs. 10 each	25,00
	75,00

Schedule 2-Reserves and surplus

Statutory Reserve	75,10
Additions during the year	13,80
Reserve	55,00
Balance in profit and loss accounts	90,19
	234,09

Schedule 3-Deposits

A	I. Demand deposits	111430
	II. Saving bank deposits	118605
	III. Term deposits	156520
		386555

Additional Information:

1. The authorized capital of the bank is Rs.50 lakh divided in to 5,00,000 shares of Rs.10 each; half of it has been issued and subscribed.
2. Advances amounting to Rs. 16,25,21 thousand are secured by tangible assets, those amounting to Rs. 2,50,12 are covered by bank/government guarantees while the remaining advances are unsecured.
3. All the advances of the bank are in India. Advances to priority sectors total Rs. 6,82,21 thousand, to public sectors total Rs. 2,92,76 thousand and to banks Rs. 27,55 thousand.
4. There are claims amounting to Rs. 12 thousand against the bank not acknowledged as debt. The bank has given guarantees in India totaling to Rs. 1,70,21 thousand on behalf of the customers. In addition there are acceptances, endorsements and other obligations to the tune of Rs. 2, 01,45 thousand.
5. Provision for income tax including surcharge is be made@ 51.75%.
6. 20% of the profit is to be transferred to statutory reserve.
7. On 31st March 2001 the bank held bills amounting to Rs. 9,847 thousand for collection on behalf of clients.

Balance Sheet of bank of Madurai Ltd., as on 31.3.200X

	Schedule	Rs.'000
Capital and Liabilities		
Capital	1	25,00
Reserves and surplus	2	2,34,09
Deposits	3	38,65,55
Borrowings	4	29,00
Other liabilities and provisions	5	1,02,11
Total:		42,55,75
Assets		
Cash and Balances with RBI	6	7,81,01
Balances with bank and money at call and short notice	7	8,49
Investments	8	13,92,33
Advances	9	20,17,45
Fixed assets	10	11,71
Other assets	11	44,76
Total:		42,55,75
Contingent liabilities	12	3,71,78
Bills for collection		98,47

B	i	Secured by tangible assets	162521
	ii	Covered by bank/Govt. guarantees	25012
	iii	Unsecured	14212
			201745
C	i	Advances in India	
	ii	Priority sector	68221
	iii	Public sectors	29276
	iv	Banks	2755
	v	Others	101493
			201745

Schedule 10-Fixed Assets

Premises	
At cost as on 31st march 2001	361
(-) Depreciation to date	110
	251
Other fixed assets	1890
(-) Depreciation to date	970
	920
Total:	1171

Schedule 11-Other Assets

Interoffice adjustments (net)	1274
Interest accrued	2560
Stationary and stamps	142
Non-banking assets acquired in satisfaction of claims	5000
	4476

Schedule 12-Contingent Liabilities

Claims against the bank not acknowledged as debts	12
Guarantees given on behalf of constituents	
a. in India	17021
Acceptance, Endorsements and other obligations	20145
	37178

Schedule 13-Interest Earned

Interest/discount on advances/bills	31143
Income on investments	14362
Interest on balances with RBI and other inter bank funds	3447
	48952

Schedule 4-Borrowings

I	Borrowings in India		
	i. Reserve Bank of India	2900	2900

Schedule 5- Other liabilities and provisions

I.	Bills payable	5475
II.	Interest accrued	1256
III.	Others (including provisions)	3480
		10211

Schedule 6- Cash and Balances with The Reserve Bank of India

I.	Cash in hand	2114
II.	Balances with RBI	
	i. In current accounts	75002
	ii. In other accounts	985
		78101

Schedule 7-Balance with Banks and Money at Call and Short Notice

I.	In India	
	i. Balance with banks	824
	a) in current accounts	
	ii. Money at call and short notice	25
	a) with banks	849

Schedule 8-Investments

	Investments in India in	
i.	Government securities	98652
ii.	Other approved securities	37804
iii.	Shares	1560
iv.	Debentures and bonds	1517
		139233

Schedule 9-Advances

A	i	Bills purchased and discounted	21853
	ii	Cash credit and overdrafts	99768
	iii	Term loans	81024
			201745

Illustration 2

From the following particulars, prepare the profit and loss account of Andhra bank Ltd. For the year ended 31st March 2007.

Commission charged	Rs.7, 000	Interest on current accounts	Rs.45,000
Discount on bills discounted	Rs. 2,10,000	Interest on overdrafts	Rs.60,000
Audit fees	Rs.5, 000	Interest on savings bank accounts	Rs.72,000
Establishment expenses	Rs. 60,000	Postage telegram	Rs.2,000
Interest on loan	Rs. 2,80,000	Printing and stationery	Rs.3,000
Interest on fixed deposits	Rs. 2,98,000	Unexpired discount on bills discounted	Rs.55,000
Interest on cash credits	Rs. 2,40,000	Rent and taxes	Rs.22,000
		Sundry expenses	Rs.2,000
Make a provision for doubtful debts	Rs. 30,000		

Solution: -

Andhra Bank Ltd.

Profit & Loss account for the year ended 31st March 2007

Dr.	Schedule No.	Cr. Rs.
I. *Income*		
Interest Earned	13	7,35,000
Other Income	14	7,000
Total		7,42,000
II. *Expenditure*		
Interest Expended	15	4,15,000
Operating Expenses	16	94,000
Provision for contingencies		30,000
Total		5,39,000
III. *Profit*		
Net profit for the year		2,03,000

Schedules to be annexed with Profit and Loss account

Schedule 13: Interest Earned

Discount on Bills discounted		2,10,000
Interest on:		
Loans	2,80,000	
Cash Credits	2,40,000	
Overdrafts	60,000	5,80,000
Less: Unexpired Discount on Bills Discounted		55,000
		7,35,000

Schedule 14- Other Expended

Commission, exchange and brokerage	5052
Profit on sale of investment	175
Profit on revaluation of investments	
Less: Loss on revaluation of investments	(-) 2,15
	50,12

Schedule 15-Interest Expended

Interest on deposits	22803
Interest on RBI borrowings	445
	23248

Schedule 16-Operating Expenses

Payments to and provisions for employees	11182
Rent, taxes and lighting	695
Printing and stationery	186
Advertisement and property	40
Depreciation on bank's property	271
Directors fees and allowances	348
Auditors fees and expenses	1688
Law charges	20
Postage, telegrams telephones, etc.	223
Repairs and maintenances	116
Insurance	935
Other expenditure	715
	16419

Working Notes

I	Interest earned	48952
	Add: Other income	5012
		53964
	Less: Interest expended	23248
	Operating expanses	16419
		39667
	Profit before tax	14297
	Less: Provisions for income tax @ 51.755	7398
	Profit after tax	6899
	Transfer to statutory reserve 20%	1380
Ii	Provision for income tax for the year	7398
	Less: Tax paid in advance	7221
	Net provision for income tax	177
	Rebate on bills discounted	3303
	Others including provision to appear in Schedule 5	3480

Solution:

Yes Bank Ltd.
Profit & Loss Account for the year ended 31st March 2007

	Schedule	Rs.
I. *Income*		
Interest Earned	13	2,71,500
Other Income	14	62,500
Total		3,34,000
II. *Expenditure*		
Interest Expended	15	2,20,190
Operating Expenses	16	75,000
Provision for Contingencies		-
Total		2,95,190
III. *Profit*		
Net Profit for the Year		38,810

Schedule to be annexed with Profit and Loss Account
Schedule 13

Interest Earned

Interest on:		
Loan	45,000	
Cash Credit	24,000	
Overdrafts	71,000	1,40,000
Discount on Bills discounted	89,000	
Less: Rebate on Bill Discounted	29,000	60,000
Amount charged against current accounts		71,500
		2,71,500

Schedule 14

Other Income

Commission charged to customer	62,500

Schedule 15

Interest Expended

Interest paid on	
Fixed Deposits	1,62,410
Savings bank Deposits	57,780
	2,20,190

Schedule 14

Other Income	
Commission Charged	7,000

Schedule 15

Interest Expended	
Interest paid on:	
Fixed Deposits	2,98,000
Current Accounts	45,000
Savings Bank Accounts	72,000
	4,15,000

Schedule 16

Operating Expenses	
Establishment Expenses	60,000
Audit Fees	5,000
Rent and Taxes	22,000
Postage and Telegrams	2,000
Printing and stationery	3,000
Sundry Expenses	2,000
	94,000

Illustration 3

Prepare the Profit & Loss account of Yes Bank Ltd. For the Year ended 31st March, 2007 from the following:

	Rs.
Interest on Fixed Deposits	1,62,410
Rebate on Bills discounted	29,000
Interest on Loans	45,000
Commission charged to customers	62,500
Establishment	15,000
Discount on Bills Discounted	89,000
Interest on Cash Credit	24,000
Amount charged against Current Accounts	71,500
Directors' Fees	10,000
Audit Fees	20,000
Postage and Telegram	2,000
Printing and Stationery	4,000
Rent and Taxes	22,500
Interest on Overdrafts	71,000
Sundry Charges	1,500
Interest on Savings Bank Deposits	57,780

UNIT III

Learning Objectives: This unit aims to provide the students with financial statement analysis. After going through Unit III, students will be able to learn the following concepts.

- Ratio Analysis
- CAMEL Model
- Cash Reserve Ratio
- Statutory Liquidity Ratio
- Net Demand and Time Liabilities

3.1 INTRODUCTION:

The basis for financial planning, analysis and decision –making is financial information. This information is reflected in the financial statements. The financial statements provide a summarized view of the financial position and operations of a bank. Financial analysis is the process of identifying strength and weaknesses of the bank by properly establishing relationships between the items of the balance sheet and the profit and loss account.

Ratio Analysis: It is a widely used tool of financial analysis. Ratios refer to numerical relationship between two variables or component parts of the statements. The relationship can be expressed as percentages, fraction and proportion of numbers. The rationale of ratio analysis is that it makes related information comparable, as ratios are relative figures. For example, simply a bank having net profit of Rs 10 crore will not signify much regarding its performance unless it is related to its equity capital or net worth. In financial analysis, a ratio is used as a benchmark for evaluating the financial position and performance.

Certain ratios are used for evaluating and comparing financial performance of banks. In banks, ratios that enable evaluating Capital Adequacy, Asset Quality, Profitability, Liquidity and Staff Productivity are used.

i) ***Capital Adequacy***: The Capital Adequacy Ratio is the ratio of the bank's capital to its risk weighted assets.

$$\text{CRAR} = \frac{\text{Total Capital}}{\text{Risk Weighted Assets (RWA)}}$$

The higher the ratio the better the sustenance of the bank.

Note: Depending on the risk exposure, weights are assigned to the assets, which give the risk-weighted assets of banks.

Schedule 16

Operating Expenses

Establishment Expenses	15,000
Directors' Fees	10,000
Audit Fees	20,000
Rent and Taxes	22,500
Postage and Telegrams	2,000
Printing and stationery	4,000
Sundry Expenses	1,500
	75,000

Suggested Exercise1:

The following are details of advances of Punjab Bank Ltd.,

Bills purchases and Discounted.	15,00,000
Cash Credits, Overdrafts and Loans Repayable on Demand	20,00,000
Term Loans	5,00,000
The following are other details of the above advances:	
Secured by Tangible assets	30,00,000
Covered by Bank, Government and ECGC guarantees	6,00,000
Unsecured	2,00,000
Doubtful Debts	2,00,000

Show how these items will appear in the Bank's Balance Sheet.

Exercise 2:

The trial balance of National Bank Ltd. As on 31st March2007 stood as follows

	Rs.		Rs.
Paid-up-capital	10,00,000	Reserve Fund	3,85,000
Local Bills Discounted	9,00,000	Cash Credits and Overdrafts	23,00,000
Current and Savings Deposits	25,00,000	Furniture	20,000
Fixed Deposits	20,00,000	Profit & Loss Account (Credit Balance)	1,10,000
Stamps & Stationery	5,000	Cash at Bank	6,50,000
Cash in Hand	2,50,000		
Investments at Cost	4,75,000		

Out of the total debt, debts of Rs. 2,85,000 were considered doubtful amounting Rs 24,00,000 were fully secured and for debts amounting to Rs. 4,00,000 (including Rs. 1,15,000 due by a director) the bank held personal securities of one or more persons over and above the personal securities of the debtors and for the balance the bank held no other security than the personal security of the debtors.

The directors require the Bank investments to be shown in the Balance sheet at market value on 31st March 2007, which is Rs. 5,25,000.

Prepare the Balance Sheet of the Bank on 31st March 2007 in the prescribed form.

- **Earnings Per Share (EPS)** = $\frac{\text{Net Profit}}{\text{No. of Equity Shares}}$

- **P/E Ratios** = $\frac{\text{Market Price of Share}}{\text{EPS}}$

- **Equity Multiplier** = $\frac{\text{Total Assets}}{\text{Total Equity}}$

(I) Net profit of a bank reflects the profitability of a bank. NII and NIM measure the sustenance ability of the bank based on a bank's spread. The difference between the revenue generated by interest bearing assets and cost of borrowed funds gives the NII of the bank. The NII when expressed as a percentage of the earning assets give the NIM of the bank. Higher the NIM , better is the profitability.

(II) Profit margin, which is the ratio of net profit to total income, indicates how much a bank earns over its expenditure and taxes. A higher profit margin ratio indicates low expenses and taxes.

(III) Return on Assets (ROA) indicates is an important indicator of the performance of the as it assesses the profitability of the bank based on the assets. A high ROA indicates better use of funds, low level of losses or bad debts and low operating expenses. Return on Assets measures efficiency or how well the bank is using its assets to generate income.

(IV) Equity Multiplier is a measure of a bank's financial leverage. A higher financial leverage works to the bank's advantage by boosting the return on Equity (ROE) when earnings are positive.

Illustration 1: Calculate Interest Income & Interest expense of XYZ bank

Assets	**Amount Rs. In Crore)**	**Yield (% p.a)**	**Income (Rs. In Crore)**
Cash balance	6900	0	0
Balance with banks, Money at call and short notice	15000	5	750
Investments	15000	8	1200
Bills Purchased	20000	7	1400
Cash Credit	20000	9	1800
Term loans	20000	09	1800
Fixed Assets	3100		0
Total Interest income			**6950**
Liabilities	**Amount Rs. In Crore)**	**Cost (% p.a)**	**Expenses (Rs. In Crore)**
Demand Deposits	30000	3	900
Saving Deposits	30000	4	1200
Time Deposits	30000	5	1500
Borrowings	3000	4	120
Total Interest Expenses			**3720**

ii) *Asset Quality*: The following ratios help in assessing the asset quality of bank.

- **Gross NPAs/Gross Advances**
- **Gross NPAs/Total Assets**
- **Average Risk Weighted Assets**
- **ARWAs = RWAs / Total Assets**
- **Credit / Deposits**
- **Investment/ Deposits**
- **(Credit + Investment)/Total Assets**

Note: The level of NPAs indicate the level of assets that have deteriorated in their quality. When they are compared to total advances or total assets etc., a lower ratio will indicate a better asset quality.

iii) *Profitability Ratios*: Some important profitability ratios normally used are the followings: -

- **Interest Expense Ratio = Interest Expenses / Total Income**
- **Interest Income on Total Assets = Interest Income / Total Assets**
- **Net Interest Margin = Net Interest Income / Earning Assets**
- **[Net Interest Income (NII) = Interest Income – Interest Expense]**
- **Profit Margin = Net Profit / Total Income**
- **Return on Assets (ROA) = Net Profit / Total Assets**
- **Return on Equity (ROE) = Net Profit / Total Equity**

Capital Adequacy: It is observed from the table that there is no change in the CRAR as it remained the same for both the years. It may mean that that has been no change in the capital and the risk-weighted assets during the two years or there may have been a rise/fall in them in by the same proportion resulting in the ratio being stable. And at 10% level, the ratio is more than the statutory prescription and also places the bank in a better position to meet any adverse impact due to the RWAs. While CRAR indicates that the bank is in the same capital adequacy position during the 2 years under consideration, the reduction of the core CRAR does not reflect so. By studying the financial statements, the actual reason for such fall in the core capital will have to be examined before commenting on the capital adequacy of the bank.

Asset Quality: In the second set of ratios pertaining to asset quality, there is a rise in the gross NPAs to the gross advances ratio indicating a rise in the gross NPAs or a fall in the gross advances or both. A rise in NPAs means that the quality of the assets is deteriorating while a fall in the advances may be due to several reasons like change in management policy, a change in economic environment etc. In the second ratio, i.e., the ratio of Net NPAs to Net Advances, there has been a fall in the ratio indicating a fall in the net NPAs or a rise in net advances, or both. A fall in the net NPAs may reflect better asset quality. But in this case, this may not hold true since there is a rise in the ratio of gross NPAs to gross advances. One also has to consider the provisions and write-offs that are reduced from the gross NPAs to arrive at the net NPAs. A fall in the net NPAs when there is an actual rise in the gross NPAs means that more provisioning has been made during the year. It imples a fall in the quality of assets.(The provisioning requirements will increase as the asset moves down the various asset categories i.e, standard, sub-standard, doubtful and loss).

Profitability: The NIM of the bank has fallen suggesting a fall in the interest income or a rise in the interest expense. While a fall in the interest income may be due to a fall in asset quality or due to improper deployment of funds, a rise in interest expenses may indicate rising interest costs. By considering the asset utilization ratio and the NIM collectively, it can be observed that due to interest rate structure moving upwards, there would have been a rise in the interest expenses that was more than the rise in the interest income, thereby squeezing the spread. On the other hand, the asset utilization has increased indicating that there may have been a rise in the total income of the bank. A fall in spreads and a rise in the total income imply that the bank may have shifted its focus on fee-based activities due to which the other income increased thereby increasing the total income. Such a shift in activities may also be due to the rising interest rates.

Liquidity: A rise in the net loans to total assets may be considered as a fall in the liquidity of the bank. However, such an inference cannot be drawn unless the loan portfolio is examined since an increase in short-term loans could also have contributed to an increase in net loans.

3.2 CAMELS Model :

Banks are rated on various parameters based on financial and non-financial performance. One popularly used assessment is referred to as CAMELS, where each letter refers to a specific category of performance.

Now, let us find out the various measures of returns and risks of the XYZ Bank from the above data.

A. Measures of Returns:

Interest margin = [Interest Income – Interest Expenses] / Earning Assets
= [6950-3720] / 90000 = 3.59%
Net Profit Margin = Net Income / Total Income = 830 / 6950 = 11.94 %
Asset Utilization = Total Income / Assets = 6950 / 1000000 = 6.95%
Return Of Assets = Net Income / Assets = 830 / 1000000 = 0.835
Equity Multiplier = Assets / Equity = 1000000 / 7000 = 14.29
Return on Equity = Net Income / Equity = 830 / 7000 = 11.85%

B. Measures of Risks:

Liquidity Risk = Short-Term Securities / Deposits
= 15000 / 90000 = 16.67%
*(Balance With Banks, Money At Call And Short Notice)
Interest Rate Risk = Interest Sensitive Assets / Interest Sensitive Liabilities
= 55000 / 63000 = 0.87
Credit Risk = Medium Quality Loans / Assets
= 20000 / 1000000 = 205
Capital Risk = Capital / Risk Assets
= 7000 / 75000 = 9.33%

Illustration 2:The following table gives a few ratios of a commercial bank for 2 years. Analyze the ratios and comment on the performance of the bank:

Ratio	2000-01(%)	2001-02(%)
Capital Adequacy		
CRAR	10.00	10.00
Core CRAR	6.00	5.00
Asset Quality		
Gross NPAs/Gross Advances	14.00	15.00
Net NPAs/Net Advances	7.00	6.15
Profitability		
NIM	2.95	2.00
Asset Utilisation	10.79	11.25
Liquidity		
Net Loans to Total Assets	40.67	42.15

Table1: CRR, Bank Rate, PLR and Deposit Rate

(In per cent)

Months	CRR	Bank Rate	PLR	Deposit Rate
	(1)	(2)	(3)	(4)
April, 2006	5	6	10.25-10.75	6.00-7.00
May, 2006	5	6	10.75-11.25	6.25-7.00
June, 2006	5	6	10.75-11.25	6.25-7.00
July, 2006	5	6	10.75-11.25	6.25-7.00
August, 2006	5	6	11.00-11.50	6.50-8.00
September, 2006	5	6	11.00-11.50	6.75-8.00
October, 2006	5	6	11.00-11.50	6.75-8.00
November, 2006	5	6	11.00-11.50	6.75-8.00
December, 2006	5.25	6	11.00-11.50	7.00-8.00
January, 2007	5.5	6	11.50-12.00	7.50-8.50
February, 2007	5.75	6	12.25-12.50	7.50-9.00
March, 2007	6	6	12.25-12.50	7.50-9.00

Rural Banks) as on last Friday.
2. Prime Lending Rate (PLR) relates to five major banks.

Source: Weekly Statistical Supplement, various issues.

3.3.2 Statutory Liquidity Ratio (SLR):

The SLR is maintained in liquid and near cash instruments. The SLR is to be maintained in the following forms : in cash , or in gold valued at a price not exceeding the current market price, or in unencumbered approved securities valued at a price as specified by the RBI from time to time. The main purpose of SLR is to provide profitability along with liquidity since the funds would be parked in interest yielding government and other approved securities. According to the Banking Regulation Act, 1949, all banks in India are required to maintain

- **C**- It stands for Capital adequacy. It is measured by Size of the bank, Volume of inferior quality assets, Bank's growth, Retained earnings, and access to capital markets.
- A- It stands for Asset quality measured by Volume of Classifications, Special mention loans, Volume of Concentrations and Volume and Character of insider transactions.
- **M**-It stands for Management quality. This is a qualitative measure which uses risk management policies and processes as indicators of good management.
- **E**- It stands for Earnings which uses quantitative measures like Return on Assets, Material components, and income and expenses, Adequacy of provisions for loan losses, Quality of earnings , Dividend payout ratio . These ratios are compared to peer group averages and bank's own trends.
- **L**- It stands for Liquidity. This measure takes into account the adequacy of the bank's current and potential sources of liquidity, including the strength of its fund management practices.
- S-It stands for Sensitivity to market risk. This measure is used to indicate the degree to which changes in interest rates, exchange rates affect the bank's capital.

Ratings are assigned for each component and the ratings are assigned on a scale from 1 to 5.If the rating analysis ranges between 1.0 – 1.4 that bank is interpreted as sound in every respect; if the rating ranges from 1.6 – 2.4 that bank is interpreted as fundamentally sound with modest correctable weakness; if the rating ranges from 2.6 – 3.4 that bank requires more than normal supervision.

3.3 RESERVE REQUIREMENTS RATIO:

Reserve requirements are mandatory if the liquidity in the banking system is to be preserved, and if even a single instance of default in repayment to depositors is to be avoided. In the Indian context, these reserve requirements are categorized as follows:

- **Cash Reserve Ratio(CRR)**
- **Statutory Liquidity Ratio(SLR)**

3.3.1 Cash Reserve Ratio (CRR):

The CRR has to be maintained only as deposits with the RBI, or cash balances in the "currency chest". The "currency chest" is maintained at individual bank premises, but is deemed to be part of RBI. The cash deposited with the currency chest is deemed to have been deposited with the RBI. Banks have to maintain the cash balance with RBI for a period of a fortnight. Banks have the flexibility of distributing the reserve maintenance depending upon intra-period cash flows. According to the latest directives (11October,2006) banks are required to maintain minimum CRR balances up to 70 percent of the total CRR requirement on all days of the fortnight. But on the last day of the fortnight, the total amount of reserves required for fulfilling the CRR requirement has to be maintained without fail. If there is shortfall, the bank is considered a defaulter in meeting the CRR and is penalized.

All banks are required to maintain the prescribed CRR which is @ 5 % with effect from the fortnight beginning 2 October 2004. Further , Reserve Bank of India (Amendment) Bill , 2006 has done away with the floor and ceiling rate of the CRR to be maintained by banks . Accordingly, the statutory minimum CRR of 3 percent no longer exists.

2) Given the following ratios, comment on the asset quality of the bank.

	Year 2006	Year 2007
Credit/deposit	44.65%	46.78%
Investment/deposit	53.64 %	50.60%
(Credit + Investment)	76.37%	74.91%
Total assets		

3) Explain the CAMEL model.

4) Discuss the features of CRR.

SLR at a minimum rate of 25% and a maximum of 40% of their demand and time liabilities. The maintenance period of SLR is also a fortnight , beginning a fortnight after the reporting Friday. Further there is no flexibility permitted in SLR maintenance, which implies that 100% of the SLR has to be maintained on a daily basis.

3.3.3 Net Demand and Time Liabilities (NDTL):

NDTL is broadly those liabilities of banks in India, which have been sourced from "banking system" and "others:" It is the aggregate of liabilities to others and net inter-bank liabilities (NIBL), where

Net inter-bank liabilities = liabilities of the banking system less assets with the banking system.

Here, three different cases may arise: **inter-bank assets are equal to, greater than or less than inter-bank liabilities.**

- If NIBL is a positive figure, it is added to the liabilities to others only where inter-bank assets are less than inter-bank liabilities.
- In case they are equal, the net effect is zero, and in case the difference is negative, i.e. inter-bank assets are greater than inter-bank liabilities, the net effect will be ignored in computing NDTL.

NDTL is measured on every alternate Friday by banks- these Fridays are termed as "reporting Fridays". If the reporting Friday is declared a holiday , then the previous working day is considered for fixing the NDTL. From the level of the NDTL obtained on the reporting Friday, each bank deducts those liabilities exempted from maintenance of statutory reserves as announced by the RBI from time to time.

Illustration 1) Bank X has computed its " liabilities to others" at Rs 1000 crore. What will be its NDTL if its inter-bank liabilities are at R 400 crore, but its inter-bank assets stand at Rs 400, Rs 500 crore or Rs 200 crore?

Solution:

NDTL= liabilities to others + NIBL (inter- bank liabilities – inter-bank assets)

(a) NDTL= 1000+(400-400) = Rs1000

(b) NDTL=1000 + (400-500) = Rs 1000 (NIBL is negative, hence ignored)

(c) NDTL= 1000 + (400-200) = 1000 + 200 = Rs 1200

Suggested Exercise1) Given the following data, assess the bank's performance by calculating certain relevant ratios.

	Year 2006	Year 2007
Liquid assets	21,006	18,357
Total assets	34,822	31,564
Cash assets	6,492	6,070
Investments	14,514	11,919
Govt. security	14,076	11,919

The parameters mentioned above do not remain stable at all times. This variation result in creation of new financial instruments with the objective of bringing bank's profit and growth.

4.1.1 Equity Capital:

It consists of share capital raised from the shareholders. Share capital represents ownership capital. The authorized capital is the maximum capital that a bank may raise as permitted by Reserve Bank of India. According to RBI guidelines of 3 January 2002, private sector banks initially need share capital of Rs 200 crore, with a commitment to increase to Rs 300 crore within three years. Subscribed and paid-up share capital is the actual capital brought into the bank. The shareholders are the owners of the bank and share its risks, profits and losses. They have a residual claim on the earnings and assets of the bank. They enjoy limited liability, i.e. liability only to the extent of their share holding. Only equity share holders are entitled to vote at the bank's meetings, thus controlling the management They are paid their share of the bank's profits after all other claims are met, and in the event of the liquidation of the bank they share whatever is left after all its creditors have been paid.

- **Par value:** The par value of an equity share is the value stated in the memorandum and written on the share scrip. The par value is generally Rs 10 or Rs 100. It is also known as face value.

- **Issue Price:** The issue price is the price at which the equity share is issued. It consists of par value and share premium.

- **Market value:** The market value of an equity share is the price at which it is traded in the stock exchange. The bank has to be listed at the stock exchange and depending on its financial performance and growth opportunities its market price is determined at the stock exchange.

4.1.2 Preference Shares:

Preference capital represents a hybrid form of financing i.e. it has some characteristics of equity and some attributes of debentures. Preference shares are entitled to a fixed dividend but the preference shareholders do not enjoy voting rights. Preference shares are of two types like cumulative and non-cumulative preference shares. Further these are either redeemable or perpetual. The most important feature of a preference share is that the share holder enjoys the right of payment of dividends during the life of the business and in case of termination preference shareholders enjoy residual benefits before the ordinary share holder. Redeemable preference shares are redeemed after a certain period, which make them similar to debt instrument. Whereas Perpetual preference shares are not redeemed but remain till the bank exists.

In the case of a cumulative preference share, if the dividend in particular year is skipped, it is cumulated to be paid in the following year or years, thereby providing such preference share holders extra assurance on their dividend earnings. In the case of non-cumulative preference share, on the other hand, there is no such provision.

4.1.3Convertible Preference Shares:

These preference shares are convertible into ordinary equity shares after a certain period of time. After conversion these shareholders enjoy all the rights of ordinary shareholders.

UNIT IV

Learning Objectives: This unit aims to provide the students with an introduction to the basic concepts of Accounting. After going through this Unit, students will be able to learn the following concepts:

- Source of Finance in Banks
- Equity Capital:
- Preference Capital
- Debentures
- Types of Deposits

4.1 INTRODUCTION:

Source of Finance in Banks:

A Financial Intermediary acts as a vital link between the saver of funds and user of funds. Obviously, its source of income would be from end-users of its services. The "deposits" are the major sources of funds for the banks. The other sources of funds are "equity and reserves" and "borrowings." The bank needs to raise its sources of fund within regulations. The bank needs to decide on the sources of funds by making careful analysis of the following parameters.

- ***Maturity :*** The maturity of the instrument that is used by a bank for raising of funds is an important factor. Deposits holders are from diverse backgrounds and therefore, do not have the same planning horizon and they need their savings back at different points of time. The bank has to plan for the maturity of debt instrument like bond as the principal needs to repaid at the end with no risk of default.

- ***Cost of Funds*** : Investors require reasonable return on their deposits. The bank has to trade-off the return on the deposits with the expected yield from investing these funds in assets such as loans or investments.

- ***Tax Implications*** : The applicability/non-applicability of tax on the instrument is another vital factor in considering the instrument. If the bank prefers to borrow from a particular source, the availability of funds would be determined the existing tax rules.

- ***Market Conditions*** : The sentiment prevailing in the market of that particular type of instrument and the response that can be expected has to be considered by the bank while deciding on the mode of instrument that may be used for channeling funds from savers.

- ***Regulatory Framework*** : A bank has to function within the strong regulations in force. Regulatory Framework often leads to determination of one source of funds over the other.

4.3 BANK DEPOSITS

Credit extension and investment in securities, both require banks to mobilize deposits heavily from the people of the country. Equity capital serves very little purpose in meeting these fund requirements. The globalization of the financial markets has widened the avenues of funds for the banks in the capital market. Banks are now able to raise capital both in national and international markets. Deposits gathered from the local markets are considered as the primary support for assets in many banks. This has opened the scope of retail banking in India.

4.3.1 Types of Deposits

Deposits are accepted in different ways. Differentiation in deposit types may arise from the type of customer who holds the deposit nature, term of the deposit, nature and the interest factor. Based on these parameters, the deposits can be broadly classified into transaction and non-transaction deposits.

- ***Transaction Accounts***: A deposit which facilitates the account-holder a negotiable or transferable instrument, cheque, a written order of withdrawal, a telephone order to transfer funds, or other similar means of making payments and transferring monies to third parties is known as a transaction account. Current account and savings account are the most widely used transaction accounts.

- ***Non-Transaction Accounts***: When the deposit account does not facilitate routine payments or transfer of funds for other transaction purposes, it will be known as a non-transaction account. Most familiar examples of such accounts are the term deposit accounts.

4.3.2 Current Account:

Current Account is created with the objective of providing "convenience" to the customer. Current Accounts can be obtained by individuals/partnership firms/private and public limited companies/HUFs/specified associates/societies/trusts, etc. It being an operating account, the customer can easily withdraw funds from the current account using a cheque facility. However, banks do require the account-holder to maintain a certain amount of minimum balance continuously. In some cases, depending on credibility of the customer, the bank may also allow the deposit holder to overdraw (OD) from the current account .Banks do not provide interest on current accounts.

4.3.4 Savings Bank Account:

Savings Bank Account allows customers to save a part of their current income and earn interest on their savings. The interest provided in the savings account is constantly regulated by the Reserve Bank of India. The Savings Bank Account also has cheque facility but a limited number of cheques can be written. These accounts can be opened by any eligible person/persons and certain organizations/agencies as prescribed by RBI Savings bank account cannot be opened by banks in the name of:

- Government Departments
- Municipal Corporation/Committee
- Panchayat Samitis
- Metropolitan Development Authority
- Societies
- State/District Level Housing Cooperative Societies, Housing Boards
- Bodies depending on Budgetary Allocations for performance of their functions

4.1.4 Non- Convertible Debentures/Bonds:

Debentures are instruments for raising long-term debt. The bank raises funds as debt instruments on which fixed interest is paid until maturity and the principal is repaid at the time of maturity.

4.1.5 Convertible Debenture/Bonds:

Straight debentures are converted to equity shares fully or partially after a period normally 18 to 24 months from the time of issue of debentures. In fully Convertible Debentures all the debentures get converted into equity shares. Partly Convertible Debentures have two parts – one is converted to equity shares and another continues as debenture.

4.1.6 Floating Rate Bonds:

These instruments have an interest rate which is pegged to certain interest rate as benchmark like SBI's prime lending rate or LIBOR. This helps the bank from adverse affect of the rapid change of interest rate.

4.1.7 External Commercial Borrowings:

A bank or financial intermediary, which operates at international level: providing dollar loans, syndicating foreign contracts, assisting import of equipment has to possess funds in foreign exchange. ECBs are a typical loan based avenue with interest payment in the currency borrowed.

4.2 RESERVES:

4.2.1 Share Premium Reserve: This reserve is created statutorily from the premium collected from any equity issue. The account should be used only for the purpose specified in Section 78 of the Companies Act. As per this Section, the reserve may be applied by the company for:

a. Issuing to members of the bank fully paid bonus shares; or
b. Writing off the preliminary expenses; or
c. Writing off the expenses of, or the commission paid or discount allowed on issue of shares or debentures; or
d. Providing for the premium payable on the redemption of any redeemable preference shares or debentures.

4.2.2 Debenture redemption Reserve (DRR): This reserve is used to redeem the debentures issued by the bank. This is intended to be a guarantee to the investors that the debentures will be definitely paid back. Securities and Exchange Board of India (SEBI) specifies that a DRR has to be created if the maturity of the debenture exceeds 18 months.

4.2.3 Reserve Fund: Every non-scheduled bank should maintain a reserve fund and before declaring dividend for that year should transfer to such fund at least twenty percent of its declared profits in any one year. This should be followed every year till the fund equals its paid-up capital. The amount to the credit of the fund is to be invested in government securities, or in securities mentioned in the Section 20 of the Indian trusts Act, 1882, or in a special account to be opened with a scheduled bank.

4.3.5.1 Recurring Deposit Scheme (RD)

Under this scheme, a fixed sum will be paid by the customer and will be deposited every month for a pre-determined period. At the end of the period, the depositor will be paid the total amount of deposit installments with interest. Minimum and maximum deposit periods are usually 12 and 120 months respectively.

To arrive at the amount on maturity, the future value of annuity is calculated as following:
Maturity of RD= RD installment (FVIFA n,k) where "n" and "k" are the number of periods and the rate of interest respectively.

Note: Besides the annual compounding, if the interest is compounded monthly/quarterly/half-yearly, the effective rate of interest for such period will be different from the nominal rate quoted. The effective rate can be computed as given below:

$$r = \left(1 + \frac{k}{m}\right)^{m} - 1$$

Where,

r = Effective Rate
k = Nominal Rate
m = Frequency of compounding per year

For instance, if the nominal rate of interest on a 2-year term deposit is 9.5 percent and if the interest amount is compounded on a quarterly basis then the effective rate can be assessed as:

$$r = \left(1 + \frac{0.095}{4}\right)^{4} - 1 = 9.84\%$$

Illustration

1) What is the maturity value of a monthly recurring deposit of Rs1000 per month for 24 months, if the interest rate is 9 percent per annum compounded quarterly?

Effective rate = $(1 + .09/4)^4 - 1 = 9.31\%$
Rate of interest per month = $.0931/12 = .0078 = 0.78\%$
Maturity value = $A.FVIFA_{(n,k)}$ (where A= Principal amount)

$$= \text{Rs}1000 \ \frac{(1+k)^n - 1}{k}$$

$$= 1000 \ \frac{(1+.0078)^{24} - 1}{.0078}$$

$$= \text{Rs}.26,281.14$$

- Water and Sewerage/Drainage Boards
- State Textbook Publishing Corporations
- Any trading, business or professional concern whether such concern is a proprietary/partnership firm/company/association
- Any political party.

4.3.5 Deposit Schemes:

Other than liquidity, which the Savings Bank Accounts and the Current Accounts ensure, depositors would also prefer to earn interest on their surplus balances. Facilitating this are the bank's term deposits. This account enables savings plans for funds that can be left as a deposit for a period more than 15 days to 10 years. It is 7 days in case of bulk deposits. The rate of interest on such deposits vary from bank to bank .Further, the interest rates on these deposits can be "fixed" or " floating".

Unlike the current and the savings accounts, the term deposits do not facilitate transactions. This non-transactional type of deposit can, however, be classified into various categories depending on whether the entire amount is deposited at one time or over a period of time, whether the interest is compounded or withdrawn at regular intervals etc. Thus, term deposits can be in one of the following forms:

- Recurring Deposit Scheme.
- Fixed Deposit Scheme
- Reinvestment Scheme
- Cash Certificates

Table-1: Movement in Deposit Interest Rates

Interest rates	March 2001	October 2001	March 2002	October 2002
1	2	3	4	5
Domestic Deposit Rates	4.00-8.00	4.25-7.50	4.25-7.50	4.25-6.75
Public Sector Banks	8.00-9.50	7.75-9.00	7.25-8.50	6.50-7.75
a. Upto 1 year	9.50-10.50	8.50-9.25	8.00-8.75	7.00-8.25
b. 1 year to 3 years				
c. Over 3 years				
Private Sector Banks	5.00-10.25	5.00-9.50	5.00-9.00	4.00-8.75
a. Upto 1 year	9.00-11.00	8.00-10.50	8.00-9.50	7.25-9.50
b. 1 year to 3 years	9.25-11.50	8.25-10.50	8.25-10.0	7.50-9.50
c. Over 3 years				
Foreign Banks	4.25-10.00	4.25-10.00	4.25-9.75	4.00-9.75
a. Upto 1 year	7.25-10.75	5.75-10.50	6.25-10.0	5.50-10.0
b. 1 year to 3 years	7.25-10.50	7.25-10.50	6.25-10.0	5.50-10.0
c. Over 3 years				

Source: www.rbi.org/trend in Banking

and transferred to the savings bank account, assuming a re-investment rate of 4%?

Solution:

Quarterly interest amount = 1,00,000 × 0.10/4= Rs 2500

Half yearly interest amount = 1,00,000 ×0.10/2 = Rs 5000

Annual Interest Amount = 1,00,000 × 0.10 = Rs10,000

$$\text{Discounted Monthly Interest} = \frac{P \times R}{(12 + r)}$$

$$= \frac{1,00,000 \times 0.10}{12 + 0.04}$$

= Rs 830.56

4.3.5.4 CASH CERTIFICATE

Under this scheme, the maturity value will be a pre-determined amount. The interest on deposits is reinvested at quarterly rates and hence there will be interest on interest. A deposit receipt, which gives the details of deposits, will be issued to the depositor. The minimum and maximum durations are the same as for the reinvestment scheme. The issue price can be arrived at using the present value principle.

Issue Price = Face Value ($PVIFA_{n,k}$)

where, n = Tenor or period

k = Interest rate.

3) Given the interest rate of 12 percent p.a. on a certificate having a value of Rs.100 after one year, calculate the issue price of the cash certificate.

$$\text{Effective rate (r)} = \left(1 + \frac{k}{m}\right)^m - 1$$

$$= \left(1 + \frac{0.12}{4}\right)^4 - 1 = 12.55\%$$

$$\text{Issue Price (PV)} = \text{Face Value } (PVIA_{n,k})$$

$$= \frac{100}{(1+k)^n}$$

$$= \frac{100}{(1+0.1255)^1} = \text{Rs.88.85}$$

4.3.5.2 Fixed Deposit Scheme

In this scheme, a specific amount is deposited for a fixed term during which the amount cannot be withdrawn. However, the interest is paid on a monthly/quarterly/half-yearly/annual basis. By periodically withdrawing the interest, the depositor can actually earn a return on this interest amount by reinvesting it. If the monthly interest is withdrawn for reinvestment, the returns earned will be more than those for a quarterly repayment. To avoid this, the interest rate that is paid for a monthly withdrawal scheme should be such that on reinvestment it shall not yield more than the quarterly returns.

Suppose $Y = X(1+r/6) + X(1+r/12) + X$

where, X = Monthly interest amount

Y = Quarterly interest amount

r = Reinvestment rate for the monthly interest.

Simplify the above equation by multiplying with 4.

$$4X\left(1+\frac{r}{6}\right) + 4X\left(1+\frac{r}{12}\right) + 4X = 4Y$$

$$12X + 4X\left(\frac{r}{6}+\frac{r}{12}\right) = 4Y$$

$$12X + 4X\,\frac{3r}{12} = 4Y$$

$$X(12+r) = 4Y$$

$$X = \frac{4Y}{12+r}$$

Thus,

$$\text{Discounted Monthly Interest} = \frac{P \times R}{(12+r)}$$

Where,

P = Principal/Fixed Deposit Amount

R = Interest Rate

r = Reinvestment Rate for the monthly interest.

) For a 2 year FD deposit of Rs 1,00,000 with UBI bank, the interest rate is 10 percent.
(i) What would be the interest amount if payment is made on a quarterly, half-yearly and annual basis?
(ii) What would be the effective interest rate if the interest is withdrawn every month

UNIT V

Learning Objectives:
This unit aims to provide the students with an introduction to the basic concepts of Accounting. After going through this Unit, students will be able to learn the following concepts:

- Types of lending
- Types of loan
- Special types of loans
- Loan Pricing
- Fixed Vs Floating Rates
- Classification of Investments

USES OF BANK FUNDS:

5.1 INTRODUCTION:

Banks are providing credit to different categories of customers. For most of the borrowers bank credit is the primary and cheapest source of debt financing. Both demand and supply sides of the economy need bank credit. Consumers need bank credit to meet their personal liabilities which constitute the demand side of the economy, whereas on the supply side the need for credit arises from the corporate and government sectors engaged in manufacturing, trading and services. Banks are playing the primary role of channels of domestic and corporate savings to productive purposes. At the same time a bank grants credit to produce profits for itself. A bank can lend only if it is able to take on and manage credit risk that arises from the quality of the borrower and his business. Moreover on deciding the credit and its profitability a bank has to trade-off between interest rate and liquidity.

5.1.1Types of Lending:

- **Fund-based lending:** This is the most direct form of lending. It is granted as a loan or advance with an actual outflow of cash to the borrower by the bank and is supported by prime and / or collateral securities.

- **Non-fund based lending:** There are no funds outlays for the bank at the time of entering into an agreement with a counterparty on behalf of the bank's customer. Most "contingent liabilities" of the bank, more prominently, letters of credit and bank guarantees, fall under this category.

- **Asset-based lending:** In this type of lending, the bank looks primarily or solely to the earning capacity of the asset being financed for servicing its debt. Specialised lending practices such as securitization or project finance fall under this category.

4.4 Participation Certificates:

A participation certificate is an instrument arising from a secured loan extended by the bank. This is an instrument whereby a bank can sell or transfer to a third party who could be another client. The instrument which represents a hare in the loan extended by the holder of the certificate, who also has a title to the borrower's pledged assets , is guaranteed by the bank

4.5 RESTRICTIONS ON RAISING FUNDS

Due to the increasing risk of default associated with increased borrowing, certain limits have been laid down both by the lenders themselves and the regulatory authorities. The RBI lays down a maximum limit of 10 times the net worth of NBFC as the maximum amount that may be borrowed as a deposit from the depositors. Similarly, a company which approaches a bank for working capital loan will be evaluated on the basis of various parameters and would be granted a certain limit up to which it can avail this loan.

Suggested Excerxcise

1) If a depositor opens a reinvestment account at HDFC bank Ltd. The interest rate offered is 9 percent for one year scheme, 10 percent for two years scheme and 11 percent for three years scheme. (i) Ascertain the maturity amount for a half yearly reinvestment of Rs 25,000 for a period of 3 years.(ii) Ascertain the maturity amount for a quarterly reinvestment of Rs 15,000 for a period of 2 years.

2) Given the interest rate of 10 percent per annum on a certificate having a value of Rs 1000 after one year, calculate the issue price on the cash certificate.

3) Compute the maturity value of a monthly installment of Rs750 for 24 months, if the interest applied is 10 percent p.a. and is compounded quarterly.

4) Explain the features of different types of accounts.

(iii) Loan Syndication: Large projects need huge amount of funding which may not be possible for one bank to finance the entire project outlay. Syndicated loans are credits granted by a group of banks to a borrower. In a syndicated loan, two or more banks agree jointly to make a loan to a borrower. Every syndicate member has a separate claim on the debtor, although there is a single loan agreement contract. This is a popular means of borrowing funds for mergers and acquisitions and international projects. The syndication process starts with the appointment of senior bankers to bring together the syndicate of banks prepared to lend money at the terms specified by the loan. The syndicate is formed around the arrangers- often the borrower's relationship banks, who retain a portion of the loan and search for junior participants. Junior banks earn just a margin and no fees.

(iv) Loans to Consumers or Retail Lending: This loan pertains to individual consumers who seek bank loan to purchase durable goods, education, medical care, housing and other expenses. The average loan per borrower is small and repayment periods range from 1 to 5 years, except housing loans. These loans can be classified based on repayment terms as installment loans, credit cards and non-installment loans.

(vi) Loans for Agriculture: These loans are mostly short –term and seasonal in nature. They are mostly linked to working capital loans, in that the loan is used for purchase of inventory such as seeds, fertilizer, and pesticides and also to pay operating costs. Sometimes long- term loans for agriculture are given for investment in land, equipment or livestock. Loans are repaid out of cash flows arising from sale of crops harvested or produce from livestock.

(v) Non-fund based credit: Letters of Credit (LCs) and bank guarantees are the common forms of non-fund based credit limits granted to borrowers to carry on their business. These are non-fund based since there is no outlay of funds for the bank at the time of granting the facility. The income earned from these services is classified under non-interest income.

5.2 LOAN PRICING:

Banks need to price suitably not only to earn profit margins, but also to balance risk- return tradeoffs. In case of a bank the variable costs of the loans are the cost of the bank's liabilities. The fixed cost include the transaction servicing costs plus a portion of the overheads utilized for maintaining and monitoring the account. Loan pricing is difficult in the sense that every loan has a unique risk profile which needs to be quantified and built into the price. Further, the loan price also depends on the profitability of the customer to the bank. That is, if loans of two borrowers have identical risk profiles they may still carry different prices. A common method of loan pricing is discussed below: (i) (ii) For every loan, at the minimum,

Loan price = Cost of funds + Servicing costs + Risk premium + Desired profit margin.

Illustration 1 : Suppose the maturity profile of Bank Madura is depicted in the following table. The bank's first class customer wants a loan of Rs 10 crore to be repaid over the next 3 years. The bank seeks to have a net profit margin of 2.5% on all its transactions. What should be the minimum interest rate it proposes to the customer?

5.1.2 Types of Loans:

(i) ***Short-term Loans:*** These are loans with maturities of 1 year or less. These loans are mainly for financing working capital needs to the borrowers. These loans are repaid out of conversion of current assets to cash. These loans are secured loans against inventories, receivables and other current assets.

(ii) ***Long-term Loans:*** The long –term loans are taken by borrowers for acquisition of fixed assets or funding expansion/ modernization/ diversification plans of the borrower's firm. The maturity period of this loan is more than 1 year. Repayments are structured based on future cash flows of the firm from various business sources rather than on liquidation of short-term assets. These loans are fully disbursed at inception and the principal and interest are repaid depending on the borrower's capacity to generate operating cash flows.

(iii) ***Revolving Credits:*** This credits offer the most flexibility to borrowers. Revolving credits permit drawings from the line of credit at any time, and similarly, repay the whole or part of the outstanding loans as and when cash inflows happen in the borrowers' firms. The amount of this credit facility will be based on the assessed need of borrowers, underlying securities and borrowers' creditworthiness.

Though loans can be broadly classified into three types, within each type, each loan has distinguishing features based on the purpose, the collateral, the repayment period, and the borrower profile. Some special types of loans are discussed below:

5.1.3 Special Types of Loans:

(i)Loans for Working Capital: Banks lend to working capital requirements of firms, small and large. The amount of loan will depend on the working capital gap calculated by the borrower. The working capital gap represents the borrower's need for cash for uninterrupted operations, after taking into account sources of funds available in the business. Working capital loans are structured as loans against the prime securities of inventories and /or book debts or as credit limits against bills raised on buyers of the goods and services of the borrowing firm.

(ii) **Loans for Capital Expenditure and Industrial Credit:** These loans are called as term loans which have maturities more than 1 year, repayment spread over the life of the asset, or depending on the repaying capacity of the borrower. These loans are taken to expand, modernize or diversify their business. A term loan for purchase of capital asset is disbursed in full after deducting a suitable margin. Since repayment runs into several years, the bank's decision to lend normally has to be based on the long-term cash generation capacity of the borrower. Term loan repayments and interest payments are structured in any of the following ways:

- Repayment in fully amortised equal annual/half yearly/ quarterly installments. Each periodic repayment will include interest and principal in varying amounts.
- Repayment of principal in equal installments over the designated period, with interest calculated separately on declining balances.
- Sometimes, the loan agreement may call for "balloon repayments". Here the borrower is required to service only the periodic interest over the period of the loan. The entire principal amount becomes due only on maturity.

5.3 ADDITIONAL METHODS OF LOAN PRICING:

(i) Fixed Vs Floating Loan:

When the interest rates are relatively stable, banks would be willing to lend at fixed interest rates above the rates they pay for shorter term liabilities. When economy is not stable, inflation or other market forces effect it , then banks have to source funds from the market at varying interest rates. Under such situation banks would prefer to lend on floating rates and for shorter maturities. In effect, floating rate loans transfer the interest rate risk from the bank to the borrower.

Floating rates can be designed with the following alternatives:

(i) Banks may set the floating rate at a level below the corresponding fixed rate and charge a "term premium" to cover the risk on fixed rate loans.

(ii) Banks may set an interest rate cap on the floating rate loans to limit the possible increase in interest payments.

(ii) Pricing Floating Loans:

Once the benchmark rate is determined, the bank can develop and use prime rate based pricing models. In pricing many loan, a mark-up over the prime rate may be taken. As the bank-determined prime moves up or down, the interest rates charged to the borrower also increase or decrease. The mark-ups on the prime rate be calculated by an additive method or a multiplicative method termed as 'prime plus' and 'prime times' respectively. For instance, if the loan is priced as 'prime +2', the borrower will have to pay interest at 200 basis points (bps) over the prime rate. Under the 'prime times' method , if the bank wants to charge 200 basis points above a prime rate of 10 percent using the multiplicative method, the adjustment factor will be 1.2 i.e 12/10. In practice, banks fix a mark up based on the risk and other factors, and then arrive at the premium for the additive method or the adjustment factor in case of multiplicative method.

Illustration 3: A bank wants to charge floating rates to its borrowers as it anticipates interest rate volatility in the near future. The present prime rate is 10 percent. The bank wants to charge a premium of 300 bps over the prime rate. Which method of arriving at the floating rate should it use- prime plus or prime times? Which pricing method would benefit the bank more when the prime rate (a) moves up by 100 bps? (b) falls by 100 bps?

Solution:

The prime rate is at 10 percent.

The premium desired is 300 bps.

Loan price by additive method= 10 + 3=13 percent.

Loan price by multiplicative method= 10 x 1.3 = 13 percent

(The adjustment factor = 13/10= 1.3)

Case1: The prime rate moves up by 100 bps i.e to 11 percent.

The loan price by prime plus method would be = 11+3 = 14 percent

The loan price by the prime times method would be= 11x 1.3 = 14.3 percent

Case 2: The prime rate falls by 100 bps to 9 percent.

The loan price by the prime plus method would be= 9 + 3 =12 percent

The loan price by the prime times method would be=9x 1.3=11.7percent

Maturity Value	Liability Amount	Rate (per cent)
Nil	10	0
6months	20	4.5
1 year	30	6.5
2 years	15	8.0
3 years	25	11.0
Over 3 years	20	12.0

Average cost of funds= (0+4.5+6.5+8+11+12)/6

= 7 %

Loan price= average cost of funds + profit margin

= 7 +2.5

= 9.5%

Note 1: If it adds service cost of 1% and risk premium of 2% then Loan price would be as given below:

Loan price = Cost of funds + Servicing costs + Risk premium + profit margin

= (7 + 1+ 2+2.5)%

= 12.5%

Therefore, bank Madura will price its loan of Rs 10 crore @12.5%p.a.

(ii) Another approach that can be used to set the profit margin for loan transactions is to use the ROE as a determinant. The ROE is generally set based on market expectations and shareholders' required returns as given by

ROE=ROA x EM

Therefore, ROA will be the product of ROE and the inverse of the EM, which is represented by the term "equity/assets" a measure of capital adequacy of the bank.

Illustration 2) Bank Indus has assets of Rs 10,000 crores and its capital amounts to Rs 1,000 crores, what should be the profit margin it should target for the borrower seeking Rs 50 crores of credit, assuming that its cost of funds and servicing costs remain as given in Illustration 1.

ROE= ROA x EM

Here ROE = Rs 1000 crores, ROA= Rs 10,000 crores

Therefore desired return = 0.20x 1000/10000 = 0.02

The bank should target a minimum return or profit of 2 percent on the transaction.

5.4.2 Category 1- Held to Maturity (HTM)

- **Held to maturity**: These are securities purchased with the objective of holding till maturity. On the balance sheet, they are carried at amortised cost. The capital gains or losses at the time of maturity are taken in the income statement. During the holding period, unrealized gains or losses due to market fluctuations have no impact on the income statement.

Features:

- The security acquired by the banks with the intention to hold them till maturity (permanent investment) will be classified under the HTM category.
- Banks can exceed the above stipulated limit of 25% of the total investments under the HTM (permanent) category provided.
  - The excess comprises of only SLR securities.
  - The total SLR securities held in the HTM category does not excess 25% of the demand and time liabilities (DTL) as on the last Friday of the second preceding fortnight.
- Banks can therefore hold the following securities under the HTM category.
  - SLR securities up to 25% of their DTL as on the last Friday of the second preceding fortnight.
  - Non-SLR securities included under the HTM category as on 2 September 2004.
  - Fresh re-capitalisation bonds received from the Government of India towards their re-capitalism requirement and held in their investment portfolio.
  - Fresh investment in the equity of subsidiaries and joint ventures (a joint venture would be one in which bank, along with its subsidiaries, holds more than 25% of the equity).
  - Rural Infrastructure Development Fund/ Small Industries Development Bank of India.
  - Profit on sales of investments in this category should be first taken to the profit and loss account and thereafter be appropriated to the 'capital reserve account'. Loss on sale will be reconsidered in the Profit and Loss Account.
- Banks can hold debentures/bonds under the HTM category. However, these debentures/bonds must be treated as 'advances' under the following circumstances:
  - The debenture/bond is issued as part of the proposal for project finance and the tenure of the debenture is for a period of three years and above.
  - The debenture/bond is issued as part of the proposal for working capital finance and the tenure of the debenture/bond is less than a period of 1 year,and
  - The bank has a significant stake, i.e., 10% or more in the issue, and
  - The issue is part of a private placement.

5.4.3 Category 2 And 3: 'Available for Sale' and 'Held for Trading':

- **Held for Trading** (HFT):These securities are purchased with the intent to sell in the near term. They are carried at market value on the balance sheet, and therefore unrealized gains or losses could impact the income statement.

Remark: The loan price is identical for a given prime rate under the two methods. When the prime rate increases, the prime times method gives higher return (14.3 percent) to the bank . When the prime rate falls, the prime plus method yields higher return (12 percent) than the prime times.
Therefore in rising interest rate environment, banks may gain more returns by adopting the prime times method for arriving at floating rates Conversely, in a falling interest rate regime, floating rates may be arrived at using the prime plus method.

5.4 INVESTMENTS:

Another imporstant uses of bank funds is Investment. Bank needs to invest in different securities in order to offset credit risk, to be able to maintain liquidity and also to maintain interest rate risk. As a bank grants credit, to offset credit risk , banks invest in securities with low default risk thus preserving capital. Again banks need adequate liquid assets to meet unanticipated demands from depositors and other liability holders. Banks investments in marketable securities can be easily liquidated to meet this problem.
Moreover, banks can easily and quickly adjust the maturity of their securities in terms of interest rate volatility. Above all, surplus funds need to be invested as these will yield reasonable returns.

5.4.1 Classification of the Investment Portfolio:
In terms of the existing guidelines from the RBI, banks will have to hold the investments under each of the following categories as permanent or current investment. The investments which the banks hold till their maturity is referred to as permanent investments and current investments are those that are traded on daily basis. A bank's investment portfolio comprises approved securities, mainly government securities, and other investments such as shares, debentures and bonds. Banks have certain norms relating to the proportions of permanent and current investment in the approved securities that are subject to changes. For instance, permanent and current investments may be in the ratio of 25: 70 implying that maximum of 25% of the total investments in approved securities is to be invested in the permanent class. A security is classified as permanent or current at the time of obtaining it and accordingly it is entered in the accounts. Investments in the shares of the subsidiary companies are the permanent investments and any other investment other than in approved securities is considered as a current investment.
The RBI stipulates that the mix of permanent and current investments under each of the categories is estimated as follows:

Investment category	Permanent	Current
Government sector	25%	75%
Approved sector	25%	75%
Shares	-	100%
Debentures / bonds	-	100%
Subs / JVs	100%	-
Others	-	100%

Held For Trading:

- Individual securities in the HFT , will be marked to market at monthly or more frequent intervals and provided for as in the case of those in the AFS category. However, the book value of the individual securities in this category would not undergo any change after marking to market.

5.6 NON-PERFORMING INVESTMENTS

Advances are divided into two classes – standard assets and non-performing assets. Again, these non-performing assets are further classified into sub-standard, doubtful and loss assets. Standard Assets are assets, which are free from default risk.

Sub-standard Assets: These are assets that are categorized as NPA for a period not more than 2 years. The provisions governing the interest and principal payments for sub-standard assets are redesigned and shuffled from time to time. Thus, the advance classified as sub-standard should remain categorized under this category for minimum 2 years of acceptable performance.

Doubtful Assets: The assets classified as NPA for a period more than 2 years becomes a doubtful asset. Similar to sub-standard assets, the asset should not be upgraded unless consistently satisfactory performance is achieved.

Loss Assets: The assets that have incurred loss to the bank but the amount has not been charged in the profit and loss account. These losses may be identified by the bank, auditors or by the Reserve Bank of India. If a significant portion of advance is recoverable then the asset may be categorized as a doubtful asset. However, if the recoverable portion is insignificant then it should be treated as a loss asset.

In the case of non-performing loans, if interest or principal is not paid in respect of securities in any of the three categories, the banks should not recognise income from the securities. Appropriate provisions for the depreciation in the value of the investment should also be made. Banks cannot set-off the depreciation requirement in respect of these non-performing securities against the appreciation in respect of these performing securities.

A non-performing investment (NPI) (similar to a non-performing advance NPA), is one where-

- Interest/installment (including maturity proceeds) is due and remains unpaid for more than 90 days;'
- Fixed dividend on preference shares is not paid;
- Equity shares are valued at Rs. 1 per company on account of the non-availability of the latest balance sheet;
- The bank has invested in securities issued by a borrowing firm, credit facilities to whom is treated as an NPA;
- The investments in debentures/bonds, in the nature of advances, would also be subjected to NPI norms as applicable to investments; and
- State government guaranteed investments, where interest/principal/maturity proceeds remain unpaid for more than 90 days.

- **Available foe Sale** (AFS): Securities not classified under the above two categories will be included here. They too are carried at market value on the balance sheet.

Features:

- The securities acquired by the banks with the intention to trade by taking advantage of the short-term price/interest rate movement fall under HFT category.
- Banks have the freedom to decide on the extent of holdings under these two categories, after careful consideration of various aspects such as basis of intent, trading strategies, risk management capabilities, tax planning, manpower skills and capital position.
- The investments classified under, the HFT category would be those from which the bank expects to gain from movements in interest/market rates. These securities are to be sold within 90 days.
- Profit or loss on sales investments in both categories will be taken to the profit and loss Account.

Shifting Among Categories:

- Banks may shift investments to/from the HTM category once a year, with the approval of the board of directors.
- Banks may shift investments from the AFS category to the HFT category with the approval of their board of directors/ALCO/ investment committee.
- Shifting of investments from the HFT category to the AHS is generally one allowed unless under exceptional circumstances such as inability to sell the security within 90 days due to tight liquidity conditions, or extreme volatility, or market becoming unidirectional. Such transfer is permitted only with the approval of the board of directors/ALCO/ investment committee.
- Transfer to securities from one category to another should be done at the least of acquisition cost/book value/market value on the date of transfer, and the depreciation, if any, on such transfer should be fully provide for.

5.5 VALUATION OF INVESTMENTS

Held to Maturity

- These investments can be carried at acquisition cost need not be marked-to-market unless the market value exceeds the face value. In such cases, the premium should be amortised over the period remaining to maturity.
- Any diminution, other than temporary, in the value of banks' investments in subsidiaries/joint ventures should be provided for.

Available for Sale:

- The individual securities in the AFS category will be marked-to-market at quarterly or at more frequent intervals.
- Each security has to be valued, and ultimately, depreciation/ appreciation shall be aggregated for each investment category.

UNIT VI

Learning Objectives: At the end of this unit, students will understand the different aspects of Capital Structure and Risk of a bank.

- Features of Bank's Capital Structure
- Capital Structure and Risk Insolvency
- Different risk: Liquidity risk
  - Credit risk
  - Interest rate risk
  - Exchange risk and
  - Other non-financial risk

6.1 CAPITAL STRUCTURE OF A BANKING COMPANY

Capital structure of Banking Company involves balancing the interest of owners on one hand and depositors and regulators on the other. The interest of owners are in increasing the return from their investment (ROE) in the bank which implies minimizing the investment in the equity whereas the interest of deposit holders and regulators lies in solvency of the firm which implies maximizing the firms capital.

6.1.1Features of Bank's Capital Structure:

- The sources of funds are primarily short-term in nature, payable on demand. Depositors can renegotiate the term deposit rates as market interest rates change.
- Borrowed funds is more than equity capital or in other words equity base is very low.
- The proportion of fixed assets is very low.
- A high proportion of bank funds are invested in loans and advances or investments, all of which are subject to interest rate volatility.
- Operating leverage is relatively low due to the comparatively lower fixed costs.

It can be seen that the composition of assets and liabilities of the balance sheet of a bank is different from that of a manufacturing organization. More over a bank is not free to raise its different sources of funds as like a manufacturing organization.

6.2Capital Structure and Risk of Insolvency

The capital structure of a bank is exposed to different kinds of risk. The bank's assets bear the credit risk (borrower default), market risk (interest rate fluctuations) and operational risks (failure of internal systems or people). Any one or a combination of these risks, or an unanticipated outcome could result in eroding the value of banking assets The two major risks faced by a bank at any moment are **interest rate risk and credit risk**. Let us consider the impact of these risks on the balance sheet of a hypothetical banking company. The table

The RBI has also prescribed uniform accounting treatment for repo/reverse repo transactions.

5.7 INCOME RECOGNITION:

Banks may book income on accrual basis on securities of corporate bodies/public sector undertakings in respect of which the payment of interest and repayment of principal have been guaranteed by the central government or a state government, provided interest is services regularly and as such is not in arrears.

Banks may book income from dividend on shares of corporate bodies on accrual basis provided dividend on the shares has been declared by the corporate body in its annual general meeting and the owner's right to receive payment is established. Banks also book income from Government securities and bonds and debentures of corporate bodies on accrual basis, where interest rates on these instruments are pre-determined and provided interest is serviced regularly and is not in arrears. Further, banks should book income from units of mutual funds on cash basis.

Suggested Exercise

1) Discuss the different types of loans.
2) Explain the important features of each type of special loans.
3) Explain with example the difference between floating and fixed rates.
4) What do you understand by NPA? Explain the classification of assets under NPA.

- **Money at call and short notice**: Call money funds are generally overnight funds and can be borrowed by banks to meet short-term liquidity needs. Banks generally resort to call money borrowings to meet any shortfall in balances for maintaining CRR to be held with RBI. Market forces determine the interest rates in call money market.
- **Short Term Central Government Securities**: Government of India in order to raise short term finance to meet current expenditure issues 91 days and 364 days maturity Treasury bills through auctions managed by RBI.
- **Other Marketable Short Term Securities**: The "trustee" securities whose payment of interest and redemption are guaranteed by government are considered as liquid investments.
- **Securities purchased under agreement to resell (Repos)**: These transactions represent temporary purchase of Government or other securities from a seller who simultaneously agrees to repurchase same securities at a fixed price and set time in the future. The difference between sale and purchase prices is the return received by the holder. Repo transactions help to raise funds for the short duration and act as useful source of funding for short- term liquidity needs.
- **Bills Rediscounting** : A commercial bill of exchange is usually drawn and accepted for a specific period. After discounting of bill, the funds are till the date of maturity. If bank feels urgent need of funds then these bills can be rediscounted. IDBI offers bills rediscounting facility in respect of certain types of bills.

6.3.3Credit Risk:

Credit risk is commonly defined as the probability that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. Banks grant credit to produce profits. In the process they assume and accept risks. Two types of losses are possible : expected and unexpected losses. Expected losses can be budgeted whereas unexpected losses being unpredictable by nature have to be cushioned by holding adequate capital. Credit risk may arise in individual credits or transactions or in the entire loan portfolio. It may also arise because of relationship between credit and other risks.

6.3.4 Major Sources of Credit Risk:

- **Credit Concentrations**: The Basel Committee has identified 'credit concentrations' as the single most important cause of major credit problems. This can occur when a bank's portfolio contains a high level of direct or indirect credit to (i) a single borrower,(ii) a group of associated borrowers,(iii) a specific industry or economic activity,(iv) a geographic region and (v) credits with similar maturities.

- **Default Risk**: It has been found that default rates increase with time. The longer the period the higher the chances of occurrence of a default. This risk has a correlation with the ratings of borrowers. High-risk borrowers improve their risk, when they survive for a longer time and low-risk borrowers face risk deterioration when time passes.

- **Exposure Risk**: Exposure is the amount at risk in the event of default without considering recoveries. Since the default occurs at an unknown future date, the amounts at risk that count are future amounts at risk. When they are known, they must be derived

below gives the balance sheet of the banking company. Let us assume that all the figures given represent the market value of the asset or liability.

Table-1

(Figures in crore)

Liabilities and Net Worth	Rs.	Asset	Rs.
Deposits	900	Long-term Securities	800
Net Worth	100	Long-term Loans	200
Total	1000	Total	1000

As per the balance sheet, the banking company is having Rs.200 crore of its investments in the form of long-term loans. Let us assume that because of recession many borrowers defaulted in their repayment obligation due to which the value of loan fell to Rs.120 crore. The revised balance sheet of the bank as result at market value is as follows:

Table-2

(Figures in crore)

Liabilities and Net Worth	Rs.	Asset	Rs.
Deposits	900	Long-term Securities	800
Net Worth	20	Long-term Loans	120
Total	920	Total	920

As per the revised balance sheet, the net worth of the bank is decreased by Rs.80 crore because of loss in the market value of the long-term loans. Due to effect of leverage 8 percent decline in the value of total asset resulted in reduction in net worth by more than 80 percent. But there is no effect in the interest of account holders represented by the deposits. This risk occurs to the bank only.

6.3 CAPITAL STRUCTURE AND RISK:

A bank's capital structure is exposed to different types of risk. The main types of risk that affect the capital structure are **Liquidity risk, Credit risk, Interest rate risk , Exchange risk and other non-financial risks.**

6.3.1 Liquidity risk: Banks are primarily engaged in mobilization of funds from various sources for the purpose of lending and investment. After liberalization, banks have introduced different products tailored to various groups of customers. Liquidity risk is the potential inability of a bank to meet its liabilities as they become due. It is measured as the ratio between the liquidity outflow(e.g. withdrawal of deposit, repayment of bank's borrowings etc) to liquidity inflow (e.g. maturing assets, fresh deposits etc).

6.3.2Sources of liquidity risk: The primary sources of liquidity can be classified into two categories. The first category consists of assets in which funds are temporarily invested with the assurance that they will either mature or will be paid when liquidity is needed or will be readily saleable, without material loss before maturity. The second category includes the various methods by which banks can borrow or otherwise obtain funds. The potential sources of bank liquidity are as under:

6.3.8 Measuring Interest Rate Risk:

(i) Traditional GAP Analysis:

This model focuses on GAP as a static measure of risk and net interest income (NII) as a target measure of bank performance. GAP is defined as the absolute difference between rate sensitive assets (RSA) and rate sensitive liabilities (RSL) for each time period or bucket.

Process

- Determining a series of sequential time intervals called buckets.
- Grouping assets and liabilities of the bank including contingent liabilities into these time intervals.
- Forecasting interest rates for the time period during which interest rate risk is to be measured – based on experience or management judgment.
- Calculating the bank's GAP as the difference between rate sensitive assets (RSAs) and rate sensitive liabilities (RSLs) for each time bucket.
- Multiply the GAP by the forecasted interest rate to obtain expected net interest income.

Case I : Rate sensitive assets exceed rate sensitive liabilities , hence GAP is positive.								
	Liabilities (Rs. In crore)	Int. rate present	Int. rate increase	Int. rate decrease	Assets	Int. rate present	Int. rate increase	Int. rate decrease
Rate Sensitive	550	0.1	0.11	0.09	700	0.12	0.13	0.11
Non Rate Sensitive	350	0.11	0.11	0.11	250	0.14	0.14	0.14
Non Earning/non paying	100	0	0	0	50	0	0	0
Total	1000				1000			
NII earned from Assets-paid on liabilities		25.5	27	24				
RSA-RSL ((Rs. In crore)	150							

Case II : Rate sensitive assets exceed rate sensitive liabilities , hence GAP is positive.								
	Liabilities (Rs. In crore)	Int. rate present	Int. rate increase	Int. rate decrease	Assets	Int. rate present	Int. rate increase	Int. rate decrease
Rate Sensitive	800	0.1	0.11	0.09	700	0.12	0.13	0.11
Non Rate Sensitive	100	0.11	0.11	0.11	250	0.14	0.14	0.14
Non Earning/non paying	100	0	0	0	50	0	0	0
Total	1000				1000			
NII earned from Assets-paid on liabilities		28	27	29				
RSA-RSL ((Rs. In crore)	-100							

from time profile of exposure. When they are unknown , they have to be estimated , based on assumptions, conventions , or modeling of future exposures.

6.3.5 Credit Risk Management:
Although specific credit risk management practices may differ among banks depending upon the nature and complexity of their credit activities, a comprehensive credit risk management program has been put forward by Basel Committee:

(i) Establishing an appropriate credit risk environment.
(ii) Operating under a sound credit granting process.
(iii) Maintaining an appropriate credit administration, measurement and monitoring process.
(iv) Ensuring adequate controls over credit risk.

6.3.6 Interest Rate Risk: Interest rate risk is the exposure of a bank's financial condition to adverse movements in interest rates. Excessive interest rate risk could lead to substantial volatility in earnings and affects the underlying value of the bank's assets, liabilities and off-balance sheet instruments.

6.3.7 Sources of Interest Rate Risk:

(i) Mis-match Risk: Banks assume liabilities and create assets which are of different maturities and sizes. The liabilities and assets are priced differently and the difference between the interest received on assets and the interest paid on liabilities is the bank's net interest income. Assets and liabilities mature or fall due for repricing at different time intervals. Repricing also occurs because fixed assets and liabilities could have different maturities. Further, floating rate assets and liabilities could have different repricing periods , with different base rates.

(ii) Basis Risk: A bank is subject to basis risk, if the instruments have different base rates. For example, yields on a bank's floating rate assets could be tied to government security yields, while those on its floating rate liabilities could be based on an inter-bank rate such as the LIBOR. Again the complex linkages between interest rates in different segments of the market (call, repos, CDs, inter bank term money etc.) contribute to the basis risk.

(iii)Yield Curve Risk: This risk is the possibility that changes in the shape of the yield curve could have differential effects on the bank's assets and liabilities. The 'yield curve' is a line that plots the interest rates, at a set point of time, of bonds of equal credit quality, but differing maturity dates. The benchmark yield curve compares, say, the 3 month, 2 year, 5 year and 30 year treasury debt, and is then used to compare other debt in the market, such as home loan rates or bank lending rates. This curve is used to predict changes in economic output and growth. The shape of the yield curve is closely scrutinized to gain an idea of future interest rate change and economic activity. A normal yield curve represents that longer maturity bonds have higher yields compared to short-term bonds , whereas inverted curve represents short-term yields are higher than long-term yields and a 'flat' or 'humped' curve shows that short –term and long-term yields are close to one another, signifying economic transition.

Some have defined it as risk of loss arising from various types of human or technical error .All banks see some form of link between credit, market and operational risk. An operational problem with a business transaction could create credit or market risk.

6.3.10 Exchange Rate Risk:

Exchange rate is the price of one currency in terms of another. The rate varies from time to time depending upon the supply of and demand for foreign exchange in the inter-bank market. The exchange rate of a currency appreciates if the general demand for the currency at any moment exceeds the current supply. A foreign exchange transaction is a contract to buy or sell a quantity of one currency in exchange for another at a specified time for delivery and settlement and at a specified price or rate of exchange.

The foreign exchange risk arises mainly due to the fluctuations in the currency rates and relates to the sensitivity of the value of the banks' assets/liabilities denominated in any foreign currency, to unanticipated changes in exchange rates. When an organization operates in foreign currency, any appreciation in its value results in the depreciation of the domestic currency. This further leads to an increase in the domestic currency value of an organization's assets and liabilities denominated in the foreign currency and vice versa. Foreign exchange risk can be classified into three categories based on the nature of the exposure.

- **Transaction Exposure**: The transaction exposure measures the risk involved due to the change in the foreign exchange rate between the time the transaction is executed and the time it is settled. For instance, ACC Ltd. An Indian company, enters into a purchase transaction with a US based company and the transaction is invoiced in the US S. The terms of contract provide for payment after 3 months. During this period of the transaction if the Indian Rupee depreciates, then it will have to pay more rupees to remit the US S than it actually had to at the time of entering into the transaction.

- **Translation Exposure**: Differentiating itself from the transaction exposure is the transaction exposure which differs to the risk arising on account of change in exchange rates at the time of finalizing/ consolidating the financial statements which has assets/ liabilities denominated in foreign currencies. When a bank has to finalize/ consolidate its accounts , it has to convert its foreign currency denominated assets/liabilities at the applicable exchange rates as against the rates at which they are initially recorded.

- **Operating Exposure**: It arises because of the impact of the change in currency rates on the profits of an organization. This can arise even when an organization does not deal in foreign currency.

Suggested Exercise:

1) Why does capital limit the ability of banks to make loans? Is risk-weighted capital a better measure of capital adequacy?

2) Consider the following shifts in asset composition in Bank A. How will the shift affect (a) the bank's

- When GAP is positive, it indicates that the bank has more RSAs than RSLs across the time interval. Such a bank is termed asset sensitive.
- When GAP is positive, and interest rates rise by equal amounts at the same time for both assets and liabilities, NII increases. The bank would then be paying higher rates on all repriceable liabilities over the time horizon, and earning higher yields on repriceable assets.
- When GAP is negative, it indicates that the bank has more RSLs than RSAs across time interval. Such a bank is termed liability sensitive.
- When GAP is negative, and interest rates rise by equal amounts at the same time for both assets and liabilities, NII decreases. Interest expenses are larger because more liabilities are repriced.
- When GAP is negative, and interest rates fall by equal amounts at the same time for both assets and liabilities , NII increases .
- A bank's GAP would indicate whether interest income or interest expenses are likely to change more when interest rates change.
- The size of the bank GAP indicates how much interest rate risk a bank assumes.

(ii) GAP Ratio:

Gap ratio is also defined as RSAs/RSLs. When GAP is positive, the GAP ratio is greater than unity. When the GAP is negative, the GAP ratio will be less than unity. The deficiency in this measure is that it does not reflect the size of the interest rate risk a bank assumes.

When the GAP is positive, the GAP ratio is greater than unity.
When the GAP is negative, the GAP ratio will be less than unity.

Total Assets	Bank A (Rs crore)	Bank B (Rs crore)
	1000	1000
RSAs	40	400
RSLs	20	200
GAP (RSAs-RSLs)	20	200
GAP ratio(RSAs/RSLs)	2	2
NII (assumed)	200	400
Decrease in Interest rate	2%	2%
Change in NII(GAP × Δr)	-0.4	-4

- Even though the asset size and the GAP ratio are identical for both banks, Bank B assumes greater risk since its income will be more volatile when interest rates change.

6.3.9 Operational Risk:

Although banks have been experiencing risks connected with various operations since the day they commence operations, management of these risks at the bank management these risks at the bank management as also the supervisory levels has been somewhat different as compared to other risks such as credit and market risks. There is no universal definition of operational risk. Many banks defined operational risk as any risk not categorized as market or credit risk.

UNIT VII

Learning Objectives: At the end of this unit , students will understand the concept of time value of money:

- Concept of time value of money
- Future value of a single amount
- Present value of single amount
- Present value of uneven series
- Future value of annuity

7.1 THE TIME VALUE OF MONEY:

If an individual behaves rationally, he would not value the opportunity to receive a specific amount of money now equally with the opportunity to have the same amount at some future date. Individuals normally value the opportunity to receive money now higher than waiting for one or more periods to receive the same amount. This is called time preference for money and three reasons can be attributed to the individual's time preference for money. These are mainly risk or uncertainty, preference for consumption and investment opportunities as given below:

A rupee today is move valuable than a rupee a year hence because

- Individuals, in general, prefer current consumption to future consumption.
- Capital can be employed productively to generate positive returns. An investment of one rupee today would grow to (1 + r) a year hence (r is the rate of return earned on the investment).
- In an inflationary period a rupee today represents a greater real purchasing power than a rupee a year hence.

The time preference for money is generally expressed by an interest rate. This rate will be positive even in the absence of any risk. It may be referred as the risk-free rate. If an investor wants to take some kind of risk from his investment then he would want some risk premium. Thus the risk free rate compensates for time while risk premium compensates for risk. Like individuals, organizations also need risk free and risk premium for evaluating financial decisions. The interest rates account for the time value of money, irrespective of an individual's preference and attitudes. This concept helps an individual or an organization to convert different cash flows occurring at different times to amounts of equivalent value in the present, that is , a common point of reference. The two most common methods of adjusting cash flows for time value of money: compounding- the process of calculating future values of cash flows and discounting – the process of calculating present values of cash flows.

capital requirement? (b) The bank's profit potential?

3) At March 31st 2007, UCO Bank has the following position: Rs in crore)

Liabilities	Amount	Avg. Interest(%)	Assets	Amount	Avg. Interest (%)
Capital	900	0	Cash and Bank balance	500	0
Deposits	8,400	6	Advances	7,000	10
Borrowing	300	7	Investments	2,000	6
Other liabilities	400	0	Fixed and Other assets	500	0
Total	**10,000**			**10,000**	

(a) Calculate the rate sensitive GAP, assuming that all interest bearing assets and liabilities are rate sensitive.

(b) If the interest rates were to move as follows over the next one year, what would be the GAP be?

Deposits	6.75%
Borrowings	8.00%
Advances	11.00%
Investments	6.80%

4) Explain the features of different types of risk .

7.3 PRESENT VALUE OF A SINGLE AMOUNT:

(iii) Suppose someone promises to give Mr Das Rs. 1000 three years hence. What is the present value of this amount if the interest rate is 10%? The present value can be calculated by discounting Rs 1000 to present point of time, as follows:

Value three years hence = Rs.1000

Value two years hence = $\text{Rs. } 1000\left(\frac{1}{1.10}\right)$

Value one year hence = $\text{Rs. } 1000\left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)$

Present value = $\text{Rs. } 1000\left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)\left(\frac{1}{1.10}\right)$

Formula:

The process of discounting, used for calculating the present value, is simply the inverse of compounding. The present value formula can be readily obtained by manipulating the compounding formula:

$$FV_n = PV\,(1+k)^n \quad \text{.....[Equation1]}$$

Dividing both the sides of equation. [1] by $(1+k)^n$, we get $PV = FV_n\,[1/(1+k)^n]$

This is in short can be written as $PVIF_{(k,n)}$

(iv) What is the present value of Rs. 1000 receivable 6 years hence if the rate of discount is 10%?

The present value is-

Rs. 1000 * $PVIF_{10\%,6}$ = Rs. 100 (0.5645) = Rs. 564.5

(Referring PVIF table at 10 percent for 6 years)

(v) What is the present value of Rs1000 receivable 20 years hence if the discount rate is 8%? Since Exhibit 1 does not have the value of $PVIF_{8\%,20}$ we obtain the answer as follows-

$$\text{Rs1000}\left(\frac{1}{1.08}\right)^{20} = \text{Rs1000}\left(\frac{1}{1.08}\right)^{10}\left(\frac{1}{1.08}\right)^{10}$$

$$= \text{Rs1000}\,(PVIF_{8\%,10})\,(PVIF_{8\%,10})$$

= Rs1000 (0.463)(0.463) = Rs. 214

7.2 FUTURE VALUE OF A SINGLE AMOUNT:

Compounding is the process of finding the future values of cash flows by applying the concept of compound interest rate.

(i) Suppose Mr. Das invests Rs. 1,000 for three years in a saving account that pays 10% interest per year. If he lets interest income be reinvested, the investment will grow as follows:

First year	Principal at the beginning	1,000
	Interest for the year (Rs. 1,000*0.10)	100
	Principal at the end	1,100
Second year	Principal at the beginning	1,100
	Interest for the year (Rs. 1,100*0.10)	110
	Principal at the end	1,210
Third year	Principal at the beginning	1,210
	Interest for the year (Rs. 1,210*0.10)	121
	Principal at the end	1,331

Formula:

The process of investing money as well as reinvesting the interest earned thereon is called compounding. The future value or compounded value of an investment after n years when the interest rate is k percent is:

$$FV_n = PV\,(1+k)^n$$

To solve future value problems the future value factors are needed. It can be done in different ways. In the example given above, one can multiply 1.10 by itself three times or more general (1+k) by itself n times. This becomes tedious when the period of investment is long.

(ii)Suppose one deposits Rs. 1000 today in a bank, which pays 10% interest, compounded annually, how much will the deposit grow to after 8 years and 12 years?

$$\text{Rs. } 1000\,(1.10)^8 = \text{Rs. } 1000\,(2.144)$$
$$= \text{Rs. } 2144$$

The future value, 12 years hence, will be:

$$\text{Rs. } 1000\,(1.10)^{12} = \text{Rs. } 1000\,(3.138)$$
$$= \text{Rs. } 3138$$

Formula:

In general terms the future value of an annuity is given by the following formula-

$$FVA_n = A[1+k]^{n-1} + A[1+k]^{n-2} + \ldots\ldots\ldots + A$$

$$= A[(1+k)^n - 1] / k$$

where FVA_n = future value of an annuity which has a duration of n periods

A = constant periodic flow

k = interest rate per period

n = duration of the annuity

The term $[(1+k)^n - 1] / k$ is referred to as the future value interest factor for an annuity ($FVIFAk_{,n}$).

(vii) Mrs Choudhury wants to buy a house after 5 years when it is expected to cost Rs. 2 million. How much should she save annually if her savings earn a compound return of 12%?

The future interest factor for a 5 years annuity, given an interest rate of 12%, is –

$$FVIFA_{n=5,\ k=12\%} = \frac{(1+0.12)^5 - 1}{0.12} = 6.353$$

The annual saving should be –

$$\frac{\text{Rs. } 2{,}000{,}000}{6.353} = \text{Rs. } 314{,}812$$

(viii) Futura Limited has an obligation to redeem Rs. 500 million bonds 6 years hence. How much should the company deposit annually in a sinking fund account wherein it earns 14% interest to cumulate Rs. 500 million in 6 years time?

The future value interest factor for a 6 year annuity, given an interest rate of 14% is

$$FVIFA_{n=6,\ k=14\%} = \frac{(1+0.14)^6 - 1}{0.14} = 8.536$$

The annual sinking fund deposit should be –

$$\frac{\text{Rs. } 500 \text{ million}}{8.536} = \text{Rs. } 58.575 \text{ million}$$

Exhibit 1:Value of $PVIF_{k,n}$ for Various Combinations of k and n

n/k	6%	8%	10%	12%	14%
2	0.890	0.857	0.826	0.797	0.770
4	0.792	0.735	0.683	0.636	0.592
6	0.705	0.630	0.565	0.507	0.456
8	0.626	0.540	0.467	0.404	0.351
10	0.558	0.463	0.386	0.322	0.270
12	0.497	0.397	0.319	0.257	0.208

7.4 PRESENT VALUE OF AN UNEVEN SERIES:

In financial analysis one often comes across uneven cash flow streams. For example- the cash flow stream associated with a capital investment project is typically uneven. Likewise, the dividend stream associated with an equity share is usually uneven and perhaps growing.
The present value of a cash flow stream-uneven or even-may be calculated with the help of the following formula:

$$PV_n = \left(\frac{A_1}{(1+k}\right) + \left(\frac{A_2}{(1+k)^2}\right) + \ldots\ldots\ldots + \left(\frac{A_n}{(1+k)}\right) = \sum_{t=1}^{n} \left(\frac{A_t}{(1+k)^t}\right)$$

where PV_n = present value of a cash flow stream
A_t = cash flow occurring at the end of year t
k = discount rate
n = duration of the cash flow stream

7.5 FUTURE VALUE OF AN ANNUITY:

An annuity is a stream of constant cash flow (payment or receipt) occurring at regular interests of time. The premium payments of a life insurance policy, for example, are an annuity. When the cash flows occur at the end of each period, the annuity is called an ordinary annuity or a deferred annuity. When the cash flows occur at the beginning of each period, the annuity is called an annuity due.

(vi)Suppose Mr Baro deposits Rs. 1000 annually in a bank for 5 years and deposits earn a compound interest rate of 10%. What will be the value of this series of deposits (an annuity) at the end of 5 years? Assuming that each deposit occurs at the end of the year, the future value of this annuity will be:

Rs. $1000[1.10]^4$ + Rs. $1000(1.10)^3$ + Rs. $1000(1.10)^2$ + Rs. 1000(1.10) + Rs. 1000

= Rs. 1000(1.464) + Rs. 1000(1.331) + Rs. 1000(1.21) + Rs. 1000(1.10) +Rs. 1000

= Rs. 6105

the principal. The rate of interest applied is 9% p.a. for periods from 12 to 23 months and 10% from 24 to 120 months.

An amount of Rs. 1,000 invested for 2 years will grow to

$$FV_n = PV\left(1+\frac{k}{m}\right)^{(m \times n)}$$

Where,

m = frequency of compounding during a year

$$FV_n = PV\left(1+\frac{0.10}{4}\right)^{8}$$

$= 1{,}000(1.025)^8$

$= 1{,}000 \times 1.2184 =$ Rs. 1,218.

Suggested Exercise:

1). Pragati cash certificate scheme of Syndicate Bank is an ideal scheme for all classes of people under different income group. A small odd sum can be invested for a period ranging from 1 to 10 years. The certificates are issued in convenient denominations of Rs. 25, Rs. 100, Rs. 1,000 and Rs. 1,00,000. The rate of interest is 12% p.a. compounded quarterly.Calculate the issue price of a certificate of Rs. 1,00,000 to be received after 10 years.

2). Given an interest rate of 12% p.a., on a certificate having a value of Rs. 100 after 1 year, calculate the issue price of the cash certificate.

3). XYZ bank pays 12 percent and compounds interest quarterly. If Rs 1000 is deposited initially, how much shall it grow at the end of 5 years?

4). Determine the future values using time preference rate of 9 percent.

(i) The future value of Rs 15,000 invested now for a period of four years.

(ii) The future value at the end of five years of an investment of Rs 6,000 now and of an investment of Rs 6000 one year from now.

5). How long will it take to double your money if it grows at 12 percent annually?

(ix)A finance company advertises that it will pay a lump sum of Rs. 8000 at the end of 6 years to investors who deposit annually Rs. 1000 for 6 years. What interest rate is implicit in this offer?

The interest rate may be calculated in two steps:

1. Find the $FVIFA_{k,6}$ for this contract as follows:

   Rs. 8000 = Rs. 1000 * $FVIFA_{k,6}$

   $$FVIFA_{k,6} = \frac{\text{Rs. 8000}}{\text{Rs. 1000}} = 8.000$$

2. Look at the $FVIFA_{k,n}$ table and read the row corresponding to 6 years until you find a value close to 8000. Doing so, we find that

   $FVIFA_{12\%,6}$ is 8.115

   So, we conclude that the interest rate is slightly below 12%.

Illustrations:

If X has a sum of Rs.1000 to be invested, and there are two schemes, one offering a rate of interest of 10%, compounded annually, and other offering a simple rate of interest of 10%, which one should he opt for assuming that he will withdraw the amount at the end of (a) One year (b) Two years and (c) Five years?

Solutions:

Given the initial investment of Rs. 1000, the accumulations under the two schemes will be as follows:

End of years	Compound Interest Scheme	Simple Interest Scheme
1	1000 + (1000 x 0.10) = 1100	1000 + (1000 x 0.10) = 1100
2	1100 + (1100 x 0.10) = 1210	1100 + (1000 x 0.10) = 1200
3	1210 + (1210 x 0.10) = 1331	1200 + (1000 x 0.10) = 1300
4	1331 + (1331 x 0.10) = 1464	1300 + (1000 x 0.10) = 1400
5	1464 + (1464 x 0.10) = 1100	1400 + (1000 x 0.10) = 1500

3. Under the Vijaya Cash certificate scheme of Vijaya Bank, deposits can be made for periods ranging from 6 months to 10 years. Every quarter, interest will be added on to

8.3.PAY BACK METHOD:

It gives the number of years for the original investment to come back , and is calculated by dividing the amount of initial investment by the annual net cash flows .
For a highly competitive product, the standard payback is generally less, 2 or 3 years, whereas for development /infrastructure projects, the higher paybacks say, 8 to 12 years may be acceptable

Acceptance Criteria: One application of this technique is to compare the actual payback with a predetermined payback i.e., the payback is set up by management by taking information from related investments. If the actual payback period is less than the pre-determined pay back, the project would be accepted, if not rejected. Also, the pay back can be used as a ranking method. The shorter the pay back period, the more desirable the project is. In other words, projects with pay back periods less than or equal to the cut-off period will be accepted and others will be rejected.
The pay back period is a widely used investment appraisal as it is simple in both concept and application and it helps to screen off risky projects by favoring only those projects which generate substantial cash inflows in earlier years. However, as this method does not consider the time value of money, it is considered as a serious limitation.

Example :

Year	Project (A)	Project (B) Flow (A)	Cum Cash Flow (B)	Cum Cash
0	(2,00,000)	(3,00,000)	-	-
1	40,000	60,000	40,000	60,000
2	40,000	80,000	80,000	120,000
3	40,000	88,000	120,000	240,000
4	40,000	95,000	160,000	400,000
5	40,000	70,000	200,000	-
6	40,000	60,000		

Pay Back (A) = 5 years

Pay Back (B) = 3 + (300,000 – 240,000)/160,000

=3.4 years

8.4 AVERAGE RATE OF RETURN :

It is defined as the ratio of the profit in a normal year of full production to the original investment outlay.
R= Average income after tax/ initial investment

Or

R= Average income after tax/ Average investment

UNIT VIII

Learning Objectives:
At the end of this unit, students will understand the different factors that relate to investment decision. Further , they will learn the different techniques for assessing viability of investments.

Capital Investment Decision
Project Appraisal Techniques
- Pay back
- ARR
- Net present value
- Benefit Cost ratio
- Internal rate of return

8.1 CAPITAL INVESTMENT DECISION:

Term lending facilities refer to those financing instruments through which banks meet the non-working capital needs of their clients. Term loans refer to instrument of financing where a loan is availed by a borrower with repayment in periodic installments over a pre-specified period. Such term loans could either be for a project or for purchase of an asset. The tenure of project loans lie between 7-10 years including a moratorium of up to 2 years. These loans are granted for investment or capital expenditures. For granting of term loan , Detailed Project Report has to be carried out which includes Market , Technical , Financial and Economic Appraisal.

Capital Budgeting or Capital Investment Decision is the process by which the organization decides which long-term investments it is going to make. Or in other words, it is the financial appraisal part of the Detailed Project Report. It is actually the entire process of planning expenditure whose returns are expected to extend beyond one year and generate cash flows over several years. The decision to accept or reject capital investment depends on the PROJECT APPRAISAL TECHNIQUES discussed below.

8.2 PROJECT APPRAISAL TECHNIQUES :

There are several criteria that have been suggested by economists , accountants and others to judge the feasibility investments. Some are general and applicable to a wide range of investments, others are specialized and suitable for certain types of investments and industries. The important investment criteria can be classified into two broad categories – discounting and non-discounting criteria.

Non-discounted method:

i) Pay Back Method .
ii) Average Rate of Return

Discounted method:

i) Net Present Value Method
ii) Internal rate of return

The net present value of the proposal is

$$NPV = \frac{200,000}{(1.10)^1} + \frac{200,000}{(1.10)^2} + \frac{300,000}{(1.10)^3} + \frac{300,000}{(1.10)^4} + \frac{350,000}{(1.10)^5} - 10000,000$$

$$= 200,000 \times 0.909 + 200,000 \times 0.826 + 300,000 \times 0.751 + 300,000 \times 0.683 + 350,000 \times 0.621 - 10000,000$$

$$= (\text{Rs } 5,273)$$

Remark: As the Net Present Value of the proposal is negative, the proposal will be rejected.

8.6 MODIFIED NET PRESENT VALUE :

The standard net present value method is based on the assumption that the intermediate cash flows are reinvested at a rate of return equal to the cost of capital. When this assumption is not valid , the reinvestment rates applicable to the intermediate cash flows need to defined for calculating the modified net present value. The steps involved in this process are as follows:

STEP 1

Calculate the terminal value of the project's cash inflows using the explicitly defined reinvestment rate(s), which is supposed to reflect the profitability of the investment opportunities ahead of the firm.

$$TV = \sum_{t=1}^{n} CF_t(1+r)^{n-t}$$

Where TV = terminal value (i.e. future value) of the project's cash inflows
CF_t = cash inflow at the and of year t
r_e = reinvestment rate applicable to the cash inflows of the project

Acceptance Criteria:

According to the ARR, the actual ARR would be compared with a pre-determined or a minimum required rate of return. An investment decision will qualify only when the actual ARR is higher than the minimum desired ARR, otherwise it would be rejected.

Like payback criterion, ARR is simple in both concept and application. It considers the returns over the entire life of the project and therefore serves as a measure of profitability unlike payback which is a measure of capital recovery. However, this method suffers fro two important limitations. At first, this does not consider the time value of money. Second, the ARR depends on accounting income and not on cash inflows. A profitable measure based on accounting income cannot be used as a reliable investment appraisal criterion.

8.5 NET PRESENT VALUE METHOD (NPV):

The NPV of a project is defined as the value obtained by discounting, separately for each year, the difference of all cash outflows and inflows accruing throughout the life of a project at a fixed , pre-determined interest/discount rate .

$$NPV = CF1/(1+K)^1 + CF2/(1+K)^2 + \ldots\ldots + CFn/(1+K)^n - Co$$

Cfi= cashinflows , I = 1,2, ...,n
K = cost of capital
N = period
Co = Investment

Acceptance Criteria: An investment will be accepted if its NPV is positive and rejected if its NPV is negative. If the NPV becomes zero then it calls for review of all assumptions regarding the investment.

The merit of this method lies in the fact that it recognizes the time value of money. It also satisfies the required attribute of a sound method of appraisal in that it considers the total benefits arising out of the proposal over its lifetime. Further any change in the estimation of cost of capital can be built into the evaluation process by hanging the discount rate.

The main drawback of this method is that many finds difficulty in deciding the discount rate. Further, the NPV method may not give satisfactory results in the case of two projects having different economic lives. It may be likely that a project, which has a higher present value, may also have a longer economic life so that the funds will remain invested for a longer period, while the alternative proposal may have a shorter life but a smaller present value. In such situations, the net present value method may not reflect the worth of the alternative proposals.

Illustration 2: Calculate the net present value and comment on the feasibility of investment of Rs 10 lakhs given that the following cashinflows will occur as:

Year:	0	1	2	3	4	5
Cash Flow (Rs in lakhs) :	(10)	2	2	3	3	3.5

(The cost of capital for the firm is 10%.)

STEP 2: The NPV* of projects X & Y for the two reinvestment rates are:

$$NPV^*(X)_{14\%} = \frac{TV(X)_{14\%}}{(1.10)^4} - 100{,}000 = \text{Rs. } 53{,}614$$

$$NPV^*(X)_{20\%} = \frac{TV(X)_{20\%}}{(1.10)^4} - 100{,}000 = \text{Rs. } 64{,}717$$

$$NPV^*(Y)_{14\%} = \frac{TV(Y)_{14\%}}{(1.10)^4} - 100{,}000 = \text{Rs. } 52{,}158$$

$$NPV^*(Y)_{20\%} = \frac{TV(X)_{20\%}}{(1.10)^4} - 100{,}000 = \text{Rs. } 69{,}584$$

(Given PVIF@10% for 4 years = 0.683)

8.7 BENEFIT COST RATIO:

There are two ways of defining the relationship between benefits and costs:

Benefit Cost Ratio: BCR= PVB/I

Where PVB = Present value of benefits

I = Initial Investment (cost)

Illustration: Calculate the BCR for the following investment proposal.

Year	0	1	2	3	4
Cashflows	(100000)	25,000	40,000	40,000	50,000

(Given the cost of capital as 12 percent)
The benefit cost ratio of the investment is

$$BCR = \frac{25{,}000}{(1.12)} + \frac{40{,}000}{(1.12)} + \frac{40{,}000}{(1.12)} + \frac{50{,}000}{(1.12)}$$

$$= 1.145$$

STEP 2

Determine the modified net present value

$$NPV^* = \frac{TV}{(1+r)^n} - I$$

Where NPV^* = modified net present value
TV = terminal value
r = cost of capital
I = investment outlay

To illustrate the calculation of NPV*, consider two projects, X & Y

Investment Outlay	Rs. 100,000	Rs. 100,000
Cash inflows		
Year 1	31,000	71,000
Year 2	40,000	40,000
Year3	50,000	40,000
Year 4	70,000	20,000

The NPV* for X & Y may be calculated for two reinvestment rates, 14% and 20%, assuming a cost of capital of 10%.

STEP 1: The terminal values of the cash inflows of projects X & Y for the two-reinvestment rates are:

$TV(X)_{14\%} = 31{,}000(1.14)^3 + 40{,}000(1.14) + 50{,}000(1.14) + 70{,}000 = Rs.2{,}24{,}911$

$TV(X)_{20\%} = 31{,}000(1.20)^3 + 40{,}000(1.20) + 50{,}000(1.20) + 70{,}000 = Rs.2{,}41{,}168$

$TV(Y)_{14\%} = 71{,}000(1.14)^3 + 40{,}000(1.14) + 40{,}000(1.14) + 20{,}000 = Rs.2{,}22{,}774$

$TV(XY_{20\%} = 71{,}000(1.20)^3 + 40{,}000(1.20) + 40{,}000(1.20) + 20{,}000 = Rs.1{,}48{,}288$

This value is slightly higher then our target value, 100,000. so we increase the value of r from 15% to 16%. (In general, a higher r lowers and a smaller r increases the right-hand side value). The right-hand side becomes:

$$\frac{30,000}{(1+16)^1} + \frac{30,000}{(1+16)^2} + \frac{45,000}{(1+16)^3} + \frac{45,000}{(1+16)^4} = 98,641$$

Since this value is now less than 100000 , it can be concluded that the value of r lies between 15 percent and 16 percent . If a more précised value is needed then the following procedure can be used.

1. Determine the net present value of the two closest rates of return.

(NPV/15 percent) = 802

(NPV/16 percent) = 1,359

2. Find the sum of the absolute values of the net present values obtained in Step 1.

802 + 1,359= 2,161

3. Calculate the ratio of the NPV of the smaller discount rate, identified in Step 1, to the sum obtained in Step2.

802/2,161 = 0.37

4. Add the number obtained in Step 3 to the smaller discount rate : 15 + 0.37 = 15.37 percent.

Suggested Exercise

1. Sulabh International is evaluating a project whose expected cash flows are as follows—

Year	Cash flow Rs.
0	(10,00,000)
1	1,00,000
2	2,00,000
3	3,00,000
4	6,00,000
5	3,00,000

Acceptance Criteria: When BCR is greater than one , then the investment decision is accepted . When BCR is less than one , then the investment decision is rejected. When it is one , all the assumptions regarding investment appraisal needs to be reexamined.
Some of the bankers find this criteria more useful as it measures net present value per rupee of outlay.

8.8 INTERNAL RATE OF RETURN (IRR):
The IRR of a project is the discount rate, which makes its net present value equal to zero. The IRR represents the rate of return on the unrecovered investment balance in the project. It may be also said as the rate of return earned on the initial investment made in the project. In the NPV calculation it is assumed that the discount rate (cost of capital) is known and with which the NPV is determined. In the IRR calculation, the NPV is set equal to zero and then the discount rate is determined

$$Co = CF1/(1+K)^1 + CF2/(1+K)^2 + \ldots + CFn/(1+K)^n$$

Acceptance Criteria: The generally employed acceptance criterion with the IRR is to compare the IRR with a required rate of return, also known as the cut-off or hurdle rate. If the internal rate of return exceeds the required rate, the project is accepted, otherwise rejected.
IRR is a popular method of investment appraisal and has a number of merits like it takes into account the time value of money. It considers the cash flow stream over the entire investment horizon. Business man finds it easier to understand as it is linked with the rate of return on capital employed.

Illustration :To illustrate the calculation of IRR, consider the cash flows of an investment considered by Havel Limited:

Year	0	1	2	3	4
Cash flow	100000	30000	30000	40000	45000

The IRR is the value of r which satisfies the following equation:

$$100000 = \frac{30,000}{(1+r)^1} + \frac{30,000}{(1+r)^2} + \frac{40,000}{(1+r)^3} + \frac{45,000}{(1+r)^4}$$

The calculation of r involves a process of retail and error. We try different values of r till we find the right-hand side of the above equation is equal to 1000,000. Let us, to begin with, try r = 15%. This makes the right-hand side equal to:

$$10000 = \frac{30,000}{(1+15)^1} + \frac{30,000}{(1+15)^2} + \frac{45,000}{(1+15)^3} + \frac{45,000}{(1+15)^4} = 100,802$$

UNIT IX

Learning Objectives: This unit aims to provide the students with an introduction to the basic concepts of

- Introduction
- Management Of Float:
- The Working Funds Approach:
- Cash Flow Approach:
- Cash Demand Forecasting:
- Time Series Analysis Of Cash Withdrawals From ATMs:
- Judgmental Analysis Of Demand Forecasting Of Cash By Banks:
- Cash Management At ATMs:

9.1 Cash Management and Demand Forecasting in ATMs

Introduction :

The amount of cash that a bank holds is wholly dependent on the bank's liquidity and profitability. A bank in order to remain liquid needs sufficient amount of cash. At the same time, as cash assets do not generate interest income again a bank has to make trade-off between cash holding and investment where it earns profit. Banks own four types of cash assets which do not earn any income in the form of interest .The four types of cash assets owned by a bank are as follows:

- **Vault Cash**: Supply coins and currency to meet customer's regular transaction needs. The amount of cash in a bank's vault corresponds to customer cash deposits and the demand foe cash withdrawals.

- **Demand Deposit Balances at Central Bank**: Regulatory agencies authorize legal reserve requirements that can only be met by holding qualifying cash assets.

- **Demand Deposit Balances at Private Financial Institutions**: Banks serve as a clearing house for the nation's cheque payment system. The banks should hold sufficient reserves so that cheques can be written by its depositors that can get cleared when presented for payment.

- **Cash Items in the process of Collection**: Banks use cash balances to purchase services from correspondent banks.

How much cash a bank should hold is depended on many factors? Vault cash needs are fairly predictable as local businesses make regular cash deposits and bank customers withdraw cash

a. What is the NPV of the project, if the discount rate is 14% for the entire period?
b. What is the NPV of the project, if the discount rate is 12% for the year 1 and rises every year by 1%?

2. What is the internal rate of return of an investment, which involves a current outlay of Rs. 30,00,000 and results in a cash flow of Rs. 4,60,000 for first two years and then cash flow of Rs 7,85,000 for the next three years?

3. Reliance Telecom is considering two projects, Project M and Project N, each of which requires an initial outlay of Rs. 70 million. The expected cash inflows from these projects are:

Year	Project M (Rs. In million)	Project N (Rs. In million)
1	11	38
2	19	28
3	32	18
4	47	11

a. What is the payback period for each of the projects?
b. What is the discount payback period for each of the projects if the cost of capital is 12%?
c. If the two projects are independent and the cost of capital is 12%, which project (s) should the firm invest in?

Format 1: Cash forecasting

Previous	Sources and uses of funds	Current Period Actual	Forecast one Period ahead	Forecast two Periods ahead
	Opening balance (cash)			
	Cash Sources			
	Core deposits			
	Non-core large deposits			
	Time deposits			
	Other borrowings			
	Maturing investments			
	Loan repayments			
	Asset sales			
	Securitisations			
	Any other cash sources			
	Total sources			
	Cash uses			
	Maturing deposits			
	Maturing borrowings			
	New loan commitments			
	Existing loan commitments to be utilized			
	Investments in securities-long term			
	Investments in securities – short term			
	Asset purchases			
	Other uses of funds			
	Total uses			
	Net cash sources uses			
	Closing cash balance			

9.5 CASH DEMAND FORECASTING:

There are four steps in any market forecast undertaken by an organization.

- Defining the market for the product/basket of products.
- Dividing total industry demand into its main components.
- Forecasting the drivers of demand in each segment and projecting how they are likely to change.
- Conducting sensitivity analysis to understand the most critical assumptions and to gauge risks to the baseline forecast.

The selection of a forecasting method depends on the following factors:

- The context of the forecast.
- Relevance and availability of historical data.
- Time period forecasted.
- Degree of accuracy desirable.
- Cost benefit or value of the forecast to the bank.
- Time available for making the analysis.

at predictable intervals. Moreover vault cash shortages can be replenished with deposits held at a central bank or a correspondent bank. However it is very difficult to predicate the timing and magnitude of deposit inflows and outflows. Deposit inflows raise legal reserve requirements whereas deposit outflows lower reserve requirements and reduce the actual deposit holdings. Deposit outflows are also affected by customer credit and easy availability of debit cards. A bank has problem over controlling the timing of clearing and float.

9.2 MANAGEMENT OF FLOAT:

Float, in general, is defined as "Funds in the process of collection". Time exists between the moment a cheque is written and the moment the funds are deposited in the recipient's account. This time spread is called Float. Apart from cheques, other instruments that create float are telegraphic transfers, mail transfers, bank drafts etc. Money can be remitted through DD/ telegraphic transfers and mail transfers, to any other account in any other branch of the same bank. The time lag between the time when these instruments are purchased and tendered at the payee branch for payment results in float for banks. Float creates liquidity problem for the bank.

In order to minimize its cash management or liquidity problem, a bank follows two methods to estimate its liquidity requirements which are explained below:

9.3 THE WORKING FUNDS APPROACH:

According to this approach a certain amount, say, 5% of the total working funds is kept as cash or near cash instruments for its liquidity requirements. Banks also classifies its liabilities based on their maturity profiles, like , (i) Owned funds of the bank are excluded from liquidity requirements since they have only residual claim; (ii) Deposits and borrowings are segmented based on their withdrawal pattern. Volatile funds which consist of short term deposits and certificates of deposits call for 100 percent liquidity allowance. Vulnerable funds are mostly transaction deposits that are payable on demand calls for almost 100 percent allowance or lower allowance depending on the bank's risk taking capacity. Stable funds are defined as core portion of savings deposits and time deposits for which the liquidity allowance kept is very low as there withdrawal pattern are predictable. Float funds need 100 percent liquidity allowance, as these are funds in transit payable on demand.

Based on the allowance for components of its working funds, the bank would assess its desired liquidity levels and forecast its cash requirement.

9.4 CASH FLOW APPROACH:

This approach forecasts the cash flows of the bank over a specified planning horizon, and estimates liquidity needs by identifying the likely gaps between sources and uses of funds. The ending cash balance could be a surplus or deficit .

The figure B shows the total withdrawal of cash that has taken place in the month of December. Similar tables are constructed for the last 2 months, say, C shows the total for November and D shows the total for October. Using linear growth trend, one can easily forecast the total cash outflow for the month of January, 2008.

9.7 JUDGMENTAL ANALYSIS OF DEMAND FORECASTING OF CASH BY BANKS:

Safety margin- banks take into consideration the lead-time that they will take to reach cash to the branches as well as the ATMs. The time to procure that cash from the RBI or from other branches is also factored in while deciding the amount of cash that needs to be sent out. Even in case of weekends (Saturday and Sunday), many of the banks are closed and hence the money which is disbursed on Friday has to take into account the expected demand in the weekends.

Cash inflows that are expected to take place-Inflows from the RBI, from their own branches; cash position maintenance as well as other factors that effect the final decision of cash disbursal has to be considered while forecasting. One important factor which many banks consider while forecasting cash demand is the salary accounts of many employees. These are those accounts where the salaries of the employees directly get credited to their respective accounts. From the day of the salary payment, within next 4 to 5 days, normally 50% to 70% of the money is withdrawn by the account holders. Therefore, if the salary accounts get credited by the bank on the first of every month, then for the next 5 days there has to be more cash that needs to be provided at the ATMs as well as the branches.

Category of ATMs- These are categorized by some of the banks depending on the volume of transaction that takes place from the outlets. The following table shows the method of categorization used by Global Bank to grade its ATMs.

Category of ATMs-

"A" Category	Average cash dispensed per day greater than 7.5 lakh
"B" Category	Average cash dispensed per day is between Rs.5 lakh and Rs.7.5 lakh
"C" Category	Average cash dispensed per day is between Rs.1.5 lakh and Rs.5 lakh
"D" Category	Average cash dispensed per day greater than 1.5 lakh

Once the ATMs are categorized, a maximum cash retention limit can be set on the basis of the following calculation shown in the table-

The following are the factors that are kept in mind while forecasting tools for demand management of cash for the branches as well as the ATMs.

- There is no stock-out situation in any of the branches as well as the ATMs.
- There is not much of idle cash lying since the opportunity cost of holding cash is quite high.
- The cost of delivering cash to the branches and ATMs through the outsourced agents is minimized.
- The lead-time to deliver cash is minimized.

The nature of information flows, the lead times in every step of the chain, the relationship with the outsourced agents, the geographical location of the bank branches and the ATMs all play important role deciding the appropriate demand-forecasting tool. The time series data and judgmental forecasting are used by all the retail banks to predict the demand for cash.

9.6TIME SERIES ANALYSIS OF CASH WITHDRAWALS FROM ATMS:

In most banks, demand is forecasted for a period of 1 month at a time. Therefore, the demand for the month of January,2008, say gets forecasted on December,2007.
Following Table is a representative table highlighting the methodology of data calculations.
The data from XYZ Bank (for the period of November- December 2007) on the basis of the monthly cash dispensed from each of the 20 ATMs aggregated over a month were collected.

Table 1:Cash withdrawals from ATMs of XYZ Bank in December.

	1	2	3	...	28	29	30	31	Total
SR road	55,000	52,000	65,000	...	55,000	32,000	45,000	28,000	A
Panbazar	52,000	...	...	...	...	...	...	...	...
Chandmari	75,000	...	...	...	...	...	...	...	...
Dispur	51,000	...	...	...	...	...	...	...	...
Ulubari	55,000	...	...	...	...	...	...	...	...
Narangi	45,000	...	...	...	...	...	...	...	...
Beltola	1,50,000	...	...	...	...	...	...	...	...
Church gate	3,00,000	...	...	...	...	...	...	...	...
Maligaon	2,50,000	...	...	...	...	...	...	...	...
Khanapara	1,00,000	...	...	...	...	...	...	...	...
Hatigaon	2,45,000	...	...	...	...	...	...	...	...
Pandu	25,000	...	...	...	...	...	...	...	...
Fatasil	65,000	...	...	...	...	...	...	...	...
Chenikuthi	2,00,000	...	...	...	...	...	...	...	...
Total	16,68,000	...	...	...	...	...	...	...	B
Total for November									C
Total for October									D

Certain demand drives having a substantial effect on the final level of demand for cash are the following:

- Location of the branch / ATM.
- Number of current accounts.
- Resident accounts and their age profile (for e.g., some banks have a captive audience of pension holders).
- Number of salary accounts.
- Seasonal factors including weekends and festivities.

To understand its concept an illustration is given below by taking a hypothetical bank.
Let us assume the Yes Bank has 20 branches and 200 ATMs in Assam. Like any bank in the country, it does maintain an account with the RBI for cash reserve rates (CRR) requirements. In addition to this, the RBI also offers a 'currency chest' facility to the banks. Under this facility, the banks can operate their accounts for their daily requirements of cash ensuring that the CRR is maintained at the end of the day. However, Yes bank has not subscribed to this facility. It used its Head Office branch located at Panbazar as the central point for all cash issuance to the branches and ATMs in Assam. Figure A describes the flow of funds in the entire banking segment of the bank.

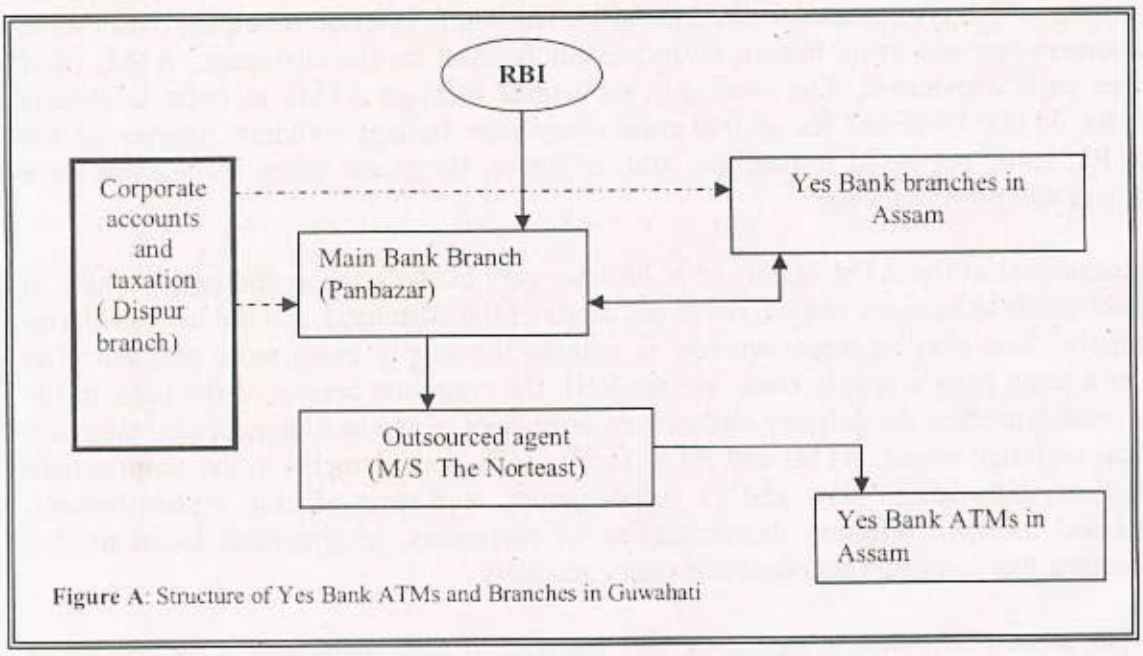


Figure A: Structure of Yes Bank ATMs and Branches in Guwahati

In the case of Yes Bank, the corporate accounts and taxation department has worked out a certain retention limits for all the branches as well as the ATMs. The factors on which such a limit is calculated by the department are as follows:

- Total deposits of the branches.
- Total advances (amount lent to the customers).
- Branch location.

Setting Limits for Each Category of ATMs-

"A" Category	7.5 lakh x 3 = 22.50 lakh
"B" Category	(7.5 + 5 lakh) / 2 = 6.25 lakh x 3 = 18.75 lakh
"C" Category	(5 + 1.5 lakh) / 2 = 3.25 lakh x 9.75 lakh
"D" Category	1.5 lakh x 3 = 4.5 lakh

The average volume of transaction is taken into consideration in each of the categories. This value is multiplied by a factor of 3. This factor can be derived by taking the standard deviations of withdrawals.

9.8 CASH MANAGEMENT AT ATMS:

All retail banks including leaders are competing for a large share of customers' financial transactions. No doubt, the number of accounts opened by individuals and companies have gone up tremendously. With the introduction of sophisticated technology like The Electronic Clearing Services and Retail Electronic Funds Transfers, the volume of transactions has gone up every day. At the same time, banks want to retain customers. Their efforts are directed towards attracting and retaining customers by offering them state-of-the art distribution system i.e. the ATMs (Automated Teller Machine). The whole exercise is helping banks serve their customers fast and avoid human invention totally. And for the customers, ATMs offer hassle free cash withdrawal. The total cash movement through ATMs in India is already between Rs. 35,000 crore and Rs. 40,000 crore every year. Indians withdraw on average Rs. 1,300 to Rs. 1,400 per ATM transaction. But, in future, things are going to be even more different and will pose challenge.

Cash management at the ATM outlets have become very challenging as the supply chain in retail banks needs to be more responsive to the needs of the customers. All the intermediaries in the supply chain play an important role in making the supply chain more efficient. The players in a retail bank's supply chain are the RBI, the corporate branch of the bank in the city, the retail branches, the delivery channel co-ordinators, outsourced agents who take care of physical cash movement, ATMs and ATM vendors. The key elements in the supply chain are cash flow, information flow and IT infrastructure, lead time of cash replenishments, payments and receipts, different denominations of currencies, geographical locations and status accounts like corporate accounts and salary accounts.

The various aspects involved in managing the logistics of cash management include ATM operations, role of forecasting in retail outlets and ATMs and the parameters that are taken into consideration, scope of network sharing, issue of having the right mix of currency denomination to be able to satisfy the demand. The chronic problem faced in such a scenario is cash stock-outs and banks are increasingly trying to synergize their supply chain with that of the external agents (ATM) vendors, outsourcing agents, and VISA network) involved in this process.

UNIT X

Learning Objectives : At the end of this unit, students will learn about the advanced risk management techniques:

- Derivatives
  - Forwards
  - -Futures
  - Swap
  - Option
- Duration
- Value at Risk
- Basel guidelines

10.1 Derivatives:

Derivatives shift the risk from the buyer of the derivative product to the seller and as such are very effective risk management tools. Derivatives have the characteristic of leverage or gearing. With a small initial outlay of funds (a small percentage of the entire contract value) one can deal big volumes. Derivatives are financial instruments which value is derived out of underlying instruments. Derivatives can be divided into two main types- the linear types where the payoff is linear e.g. forward contracts, futures and interest rate swaps and the non-linear or asymmetric types where the payoff is not linear e.g. options.

10.1.1Forward:

A forward contract is essentially OTC contracts involving only the buyer and the seller. Both the parties have necessarily to perform the contract and there is no payment of any initial margins.

Features:

- The maturity and size of the contract may be customized.
- Settlement takes place only on the date of maturity.
- Credit or Counter-party risk is high.
- Markets for forward contracts are not very liquid.
- Physical delivery takes place on the maturity date.

10.1.2 Futures:

A futures contract is an agreement to buy or sell a standard quantity of a given underlying on a future date through an Exchange at a price which is pre-determined. To trade in futures contract, one has to become a member of the exchange by paying the initial margin and maintain a variable margin account with the brokers of the exchange.

- Number of salary account holdings.
- Corporate accounts, if any.
- Total receipts/payments of the branch in the last 3 months.

This figure of retention limit is shared across all branches in Assam including the Panbazar branch. Based on the retention limits as set by the bank's Dispur branch, the cash management centre, is responsible for distributing the funds to various branches (retail outlets) and the outsourced agents for ATMs. At the end of the day, all branches are notified to return the excess cash above the retention limit to the Main Panbazar branch.

9.9 Mode of operation of OUTSOURCED AGENTS and RETAIL BRANCHES for ATMs:

Yes bank has only one outsourced agent-M/s North East , for depositing cash in their 200 ATMs across Mumbai. The outsourced agent does not maintain any vault cash count, i.e., it does not maintain certain cash balance/overdraft account with Yes Bank. The outsourcing agent account gets debited when it collects cash from the bank and it gets adjusted when the money is transferred to the ATMs.

The ATM operation is co-ordinated by delivery channel co-ordinator. The ATM switch is located at Dispur Branch and all cash forecasting is carried out in here. Each of 20 retail branches are aware of the retention limits set upon by the Dispur branch and are notified by the main branch at Panbazar that any excess cash above the retention limit should be returned to the main branch.

Thus it can be inferred that cash management and cash forecasting are highly dynamic and depends on many factors for accurate forecasting. Further whichever method of forecasting is used , due considerations should be given to the external factors that are likely to affect the forecasts. These factors include variation in business cycle conditions, monetary policy, etc. In India, monetary policy is announced twice a year- once for the busy season (October) and the other for the slack season (April).When the industry environment is on an upswing and restrictions are placed on bank credit, then liquidity position of the bank will be affected. Again, the situation becomes severe when the deposit accretion takes place at a diminishing rate. All these factors need to be considered while making the demand forecasting.

Suggested Exercise:

1) Describe the different factors used by banks for cash forecasting.

2) Explain the cash management process at ATMs.

3) Prepare cash budget for the month of February,2008 by taking hypothetical data.

- In an OTC option there is an element of credit risk between the counter parties.

10.2 Advanced Interest Rate Risk Management Tool:

10.2.1 Duration:

Gap technique is mainly preoccupied with short-term interest rate risk and movement of interest rate within shorter duration say one to two years. However a bank's assets and liabilities may be mis-matched beyond 1 or 2 years and thus expose the bank to substantial risk in the medium or long –term. Banks will also have to look at alternate methods of measuring interest rate risk over the entire life of the assets and liabilities. Duration GAP (DGAP) analysis is one such method. As the name suggests, it incorporates estimates of duration of assets and liabilities that reflect the value of promised cash flows upon maturity. Hence, it is considered a more comprehensive interest rate risk measure.

The steps involved in the duration GAP analysis are:

Step 1: Forecast interest rate changes for the planning horizon.

Step 2: Estimate current market value of the bank's assets, liabilities and shareholders' equity.

Step 3: Estimate the weighted average duration of assets, and the weighted average duration of liabilities, also incorporating the effects of off-balance sheet items, based on the estimated market values.

Step 4: Calculate duration GAP

Step 5: Forecasting changes in the bank's market value of equity under various interest rate environments,

Step 6: Formulate strategies to insulate market value of equity from interest rate volatility.

Illustration 1:

Base case: Assumptions:

- All values of assets and liabilities are market values
- Principal is repaid on maturity
- Interest paid yearly
- No defaults, payments or early withdrawals

Features:

- The maturity and size of contracts are standardized are standardized.
- Settlement is on a daily basis on all outstanding contracts (marking to market on a daily basis).
- The Exchange takes care of credit or counter- party risk.
- Futures contracts are highly liquid and can be closed out easily.
- Hardly 2 % of the total contracts are delivered and taken delivery for.

10.1.3 Swap:

A swap is an agreement is an agreement in which two parties agree to exchange periodic payments. The monetary value of the payments exchanged is based on a notional principal amount. The most common swap is the interest rate swap and banks mainly enter into this swap. Banks manage interest rate risk by adjusting the maturity or repricing schedules of their assets and liabilities.

Features

- Interest rate swaps are of-balance sheet items.
- A primary objective of the swap is to save on interest cost. Therefore, the prevailing relationship between borrowers and lenders does not change.
- The major swap market players are banks or other intermediaries and corporate entities.
- The swap contract is distinct from the original loan contract. Hence, the swap tenor is independent of the loan maturity.
- When the differential in fixed rate is greater than the differential in floating rate available to counterparties in a swap, a switch from fixed to floating rate is carried out.
- When the differential in floating rate is greater than the differential in fixed rate available to counterparties in a swap, a switch from floating to fixed rate is carried out.
- The credit risk in a swap arrangement is restricted to interest payments only, and does not affect the notional principal amount agree upon by the counterparties.

Pricing of the interest rate swap involves forecasting future benchmark rates. Some common techniques involve the use of yield curved of government securities, forward interest rates, or zero coupon securities

10.1.4 Option:

An option is essentially a contract between two parties wherein one party buys the right to sell or buy a given underlying asset at a future date at a pre agreed price and the other sells this right. The right to buy an underlying is called a Call=option and the right to sell the underlying is called the put option.

Features:

- Options are traded both through an exchange and over the counter.
- The price of an option is paid upfront.
- While the option buyer has the right to either exercise his right, the Option seller has the obligation to perform when called upon by the buyer to do so.
- Physical delivery of the underlying asset is essential once the option is exercised.

Remark:

- Interest rate risk can be seen by the mis-match between duration of assets and liabilities , as well as the DGAP of 0.518 years in the base case.
- When there is a change in interest rates, the market values of assets and liabilities would change by different amounts. This would impact the NII in the short-term as well as the market value of equity.

10.2.2 Value At Risk:

It may be defined as an estimate of maximum potential loss on a given position for a given holding period at a given level of confidence. Var is calculated for a given time horizon i.e. the holding period. There are three methods by which Var may be calculated : the Delta Normal Method, Historical Simulation and Monte Carle Simulation. The most easiest method happens to be the Delta Normal Method which is given below.

Suppose SBI Mumbai, buys 10 troy ounces of gold at USD 700 with a trading objective that the position will be held for one day. The annualised volatility of gold prices is, say, 5%. The Var may be calculated for various levels of confidence.

The current position is worth 10 X 700= 7000 USD.
The annualised volatility is 5%. The daily volatility is therefore,
D.V.= A.V./Sq.root of 250 (assuming that there are 250 trading days in a year).
= 5%/ 15.8113
= 0.3162 %
= 0.003162 in absolute terms
Therefore, volatility of gold prices for one standard deviation in its price movements is 0.003162 USD in absolute terms.
Any price movement upwards USD 700 will result in profit. But a fall in price to the extent of 0.003162 representing one standard deviation would result in a loss of 7000X0.003162=USD.
In other words, we may say that the maximum potential loss on this position when the volatility is 5% is USD for one day holding period .

10.3 Basel II And Practices In Credit Risk Management

Most of the countries including India is going to implement the new Basel Framework, more popularly known as Basel II, as laid down by the Basel Committee on Banking Supervision (BCBS). This is going to have severe implication on credit risk practices in Indian banking, the way banks appraise credit proposals, price loans, manage credit risk at the individual and portfolio level, and also manage their NPAs. Consequently, Indian banks have been preparing and implementing various measures for effective management of credit risk. RBI, in this regard, has initiated capacity building measures to identify the gaps and to assess as well as quantify the extent of additional capital which may be required by banks. This gap analysis exercise is scheduled to end in December 2006 (Reddy, 2005). Therefore, it will be prudent to

Rate sensitive liabilities	*Market values* (Rs crore)	Rate (%)	Duration (years)
3 years term deposit	400	10	2.73
Other deposits/borrowings repricing within 1 year	400	6	1
Total RSL	800		
Rate sensitive assets			
3 years commercial loans	400	12	2.69
5 year bonds	200	10	4.17
Other rate sensitive assets repricing in 1 year	100	6	1
Total RSL	700		
Total assets/liabilities	1000		
Of total liabilities, equity	90		
Weighted average duration of liabilities WADI	400/910x(2.73)+400/91x(1)		1.64 year
Weighted average duration of assets WADa	400/1000x(2.69)+200/1000x(4.17)+100/1000x(1)		2.01
DGAP	2.01-(910/1000)x1.64		0.518
Expected NII	400x0.12+200x0.10+100x0..6-400x0.10-400x0.06 = 10		
Simple duration calculations using the basic concepts of duration =	$D=\sum_{t=1}^{n} [C_t * t/(1+r)(1+r)^t] / \sum_{t=1}^{n} C_t/(1+r)^t$		

where

D = duration

t = number of periods in the future

C_t= cash flow to be delivered in the t periods

n = term-to-maturity and

r = yield to maturity (per period basis)

Sample duration calculations for the above example:

3-years commercial loan [(48/1.12)x[48/(1.12)(1.12)]x2+[448/1.12x1.12)]x3/400 =0.107(1)+0.096(2)+0.797(3)]/400 = 2.69 years

3-Year term deposit [(40/1.10) X (40/ 1.10 X 1.10) X2 + (440/ 1.10 X 1.10 X 1.10)X3]/400 = 2.73 years.

Pillar II: Under the second Pillar of regulatory requirements, banks should have internal process in place to assess the adequacy of capital in relation to their Risk Profile. Supervisors are responsible to review and evaluate banks' internal capital adequacy assessments.
Pillar III: The Basel Committee has set forth two types of disclosures under the third Pillar requirements, viz., Core and Supplementary disclosures. Core disclosures are those which convey vital information for all institutions and are important to the basic operation of market discipline. However supplementary information need to be made publicly available in case of sophisticated, internationally active banks. Further, the disclosures should be semi-annually but on broader issues like risk management it could be annual and quarterly in case of information subject to rapid change.

10.4 BASEL COMMITTEE FOR BANKING SUPERVISION-PRINCIPLES OF INTEREST RATE RISK MANAGEMENT-JULY 2004

Principle 1. In order to carry out its responsibilities, the board of directors in a bank should approve strategies and policies with respect to interest rate risk management tasks the steps necessary to monitor and control these risks consistent with the approved strategies and policies.

Principle 2. Senior management must ensure that structure of the bank's business and the level of interest rate risk it assumes are effectively managed, that appropriate policies and procedures are established to control and limit these risks, and that resources are available for evaluating and controlling interest rate risk.

Principle 3. It is essential that bank's interest rate risk principles and procedures are clearly defined and are consistent with the nature and complexity of their activities. These policies should be applied on a consolidated basis and, as appropriate, at the level of individual affiliates, especially when recognising legal distinctions and possible obstacles to cash movements among affiliates.

Principle 4. It is essential that banks have interest rate risk measurement systems that capture all material sources of interest rate risk and that assess the effect of interest rate changes in ways that are consistent with the scope of their activities. The assumptions underlying the system should be clearly understood by risk managers and bank management.

Principle 5. Banks should measure their vulnerability to loss under stressful market conditions-including the breakdown of key assumptions-and consider those results when establishing and reviewing their policies and limits for interest rate risk.

discuss and measure the effectiveness of the credit appraisal systems, on which depends the banks' asset quality and the magnitude of credit risk a bank will carry.

Basel II: The New capital Accord

The Basel Committee on Banking Supervision had released in June 1999 (Basel, 1999) the first Consultative Paper on a New Capital Adequacy Framework with the intention of replacing the 1988 Accord. The Basel Committee had released a Second Consultative Document in January 2001(Basel, 2001), which contains refined proposals for the three pillars of the New Accord – Minimum Capital Requirements, Supervisory Review and Market Discipline. This three pillar approach is depicted in diagram 2.1.

Pillar I: The Basel Committee has proposed the following approaches for estimating regulatory capital for the three types of risks that banks face viz., credit risk, market risk and operational risk.

Credit Risk

- Standardized Approach
- Internal Rating Based (IRB) Approach.

Market Risk

- Standardized Approach
- Models Approach

Operational Risk

- Basic Indicator Approach
- Standardized Approach
- Advanced Measurement

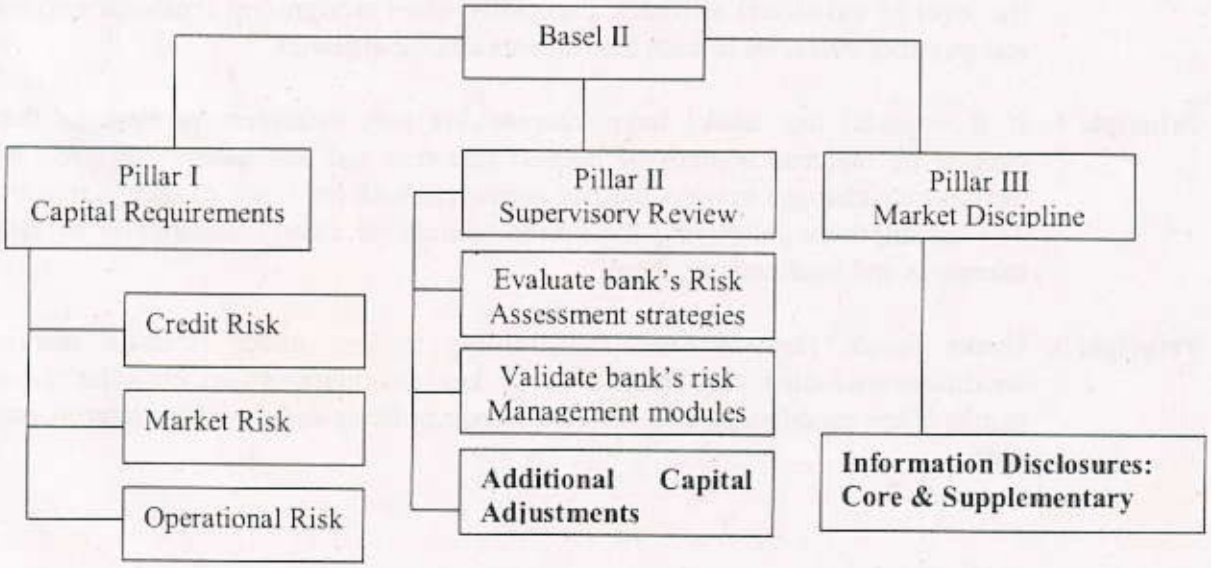


Figure 1: Three Pillar Approach of Basel II

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