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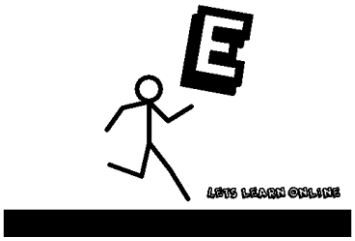

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MONEY AND FINANCIAL MARKETS

Authors

Sakshi Gupta and **Gaurav Poddar**

Written as per the **5th Semester** syllabus for B.A. Economics (H)

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First Edition – September 2013

EurekaWow
www.eurekawow.com
E-mail: eureka123.ssc@gmail.com
Follow us on facebook: www.facebook.com/Eurekawow

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ACKNOWLEDGEMENTS

EurekaWow thanks our **publishers** for encouraging our entrepreneurial venture. We sincerely thank our new members who have joined us and helped us in our venture. We would also like to thank our alma mater, St. Stephen's College, which provided us a perfect platform for initiating our project.

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Dedicated to our enthusiastic readers
who keep us on our toes…

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PREFACE

Dear Reader

Humbled by the success of our first three 'Wow-Books', EurekaWow brings to you the fruit of its latest toils – a help book for **Money and Financial Markets**. It has taken us a considerable amount of time and effort to compile this book and we hope that you find it helpful.

Money and Financial Markets is a vast course which requires a lot of reading and understanding of financial terms and related concepts. Sometimes, it becomes difficult to link various readings and understand the complex financial terms.

So, here we have aimed to keep the readings summarized, with the main bullets presented in a manner that can help you understand and organize your thoughts and present them into answers as per the question asked. We understand the monotony of those spiral readings that never end and thus this book summarizes the syllabus without compromising on the quality of the material.

How to Study?

1. Get yourself very familiar with the facts about the financial sector. Visit RBI website regularly.
2. An ideal answer in the exam gives analysis instead of facts. Even a parrot can produce a flawless fact-sheet of reforms undertaken or say definition of financial terms. What you are required to furnish is a spatial or temporal analysis of the issue concerned. Try practicing writing a

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fully fledged answer from the past year questions given at the end of every topic. Also practice numerical questions.

If you want feedback on your mock answers, mail them to us at eureka123.ssc@gmail.com. We will be ever ready to give a peer review - constructive criticism and tips for improvement! Also, we are starting a forum on our website www.eurekawow.com where you can post your queries and answer questions by others. We recommend you to participate in those discussions.

As you begin another journey through the pages of this Money and Financial Markets Wow-book, we wish you good luck for your final exams.

Btw, if you find any errors or printing mistakes, do shoot us a mail, we will love to improve our content quality and keep delivering our best.

Sincerely,
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TOPIC – 1

CHAPTER – 1.1

MONEY

Money is anything generally accepted by the society as a medium of exchange, i.e. anything used to pay for goods and services or settles debts. Coins and rupee notes (currency) which are widely accepted by the society as means to settle transactions thus form a part of money supply. Traveler's checks, checks against current accounts are other commonly used forms of money.

Liquidity describes how easily and cheaply an asset can be converted into medium of exchange. On one hand we have savings account which can easily and quickly be converted into medium of exchange and thus is liquid asset. On the other hand is real estate, an illiquid asset, as it is difficult to convert it into medium of exchange.

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FUNCTIONS

1. **Medium of exchange**:
   The use of money in an economy as a medium of exchange is its primary function. Goods, services, financial assets etc. are all paid for by using money.
   Barter, where goods and services are exchanged for other goods and services without the intermediation of money is another way of making transactions. However, there exist two problems with it
   i) ***Double coincidence of wants***- Each party involved in the transaction must have something the other desires, even if one party doesn't want the good other is trading, transaction won't happen.
   ii) ***Transaction costs***- Barter is highly inefficient because parties involved will have to spend considerable time searching for others who are willing to accept the good one is trying to sell as payment for something that he wants to have. This search time forms a part of transaction cost (cost borne in making exchange).
   Monetary economies i.e. the economies that use money as a medium of exchange are capable of solving both the above problems because now a person can simply exchange the good he produces for money and then use this to buy what he wants instead of trying to find double coincidence of wants.

2. **Unit of account**:
   The value of all goods and services can be stated in terms of money. Generally since the medium of exchange is

virtually common to all transactions thus it is convenient to state all prices in terms of it. The use of money reduces the amount of information that individuals need to operate in the market. In the absence of a common unit of account there would be more prices than goods in the economy. (If there are n goods, then there will be n*(n-1)/2 prices). The presence of money as a unit of account reduces the price information needed and thus reduces transactions cost associated with exchange.

3. **Store of value**:
   Money is a means of storing today's purchasing power to purchase tomorrow. In the absence of money (or other assets) goods will have to be stored to trade in future, even those goods which they personally didn't wish to consume but thought that others would demand for something they wished to purchase. Storage of commodities has two issues- (a) perishability i.e. some goods (like fruits, milk) will be of no/little value in future; (b) high cost of maintenance for non-perishable goods like cars. Both these problems are eliminated by the use of money. Money has its upper hand as a temporary store of value because of its liquidity property, it can be used anytime in the future to make transactions, but there exist other better store of values (over longer periods) like savings accounts, stocks etc. which even pay interests and dividends.
4. **Standard for deferred payment**:
   Money is used to state payments that are deferred to the future. In the absence of money, future payments would have to be made in terms of other goods. Having a

common standard for deferred payments as medium of exchange and unit of account makes it easier to determine exactly how much a deferred payment will be. Money however is not the best standard for all purposes.

ORIGINS OF MONEY

Religious objects of value used as medium of exchange→ Barter System→Monetary Economy (use of gold as medium of exchange)→Paper Currency

Types of Money:

1. **Commodity Money**: Any physical commodity that is used as money but at the same time has alternative non-monetary uses is called commodity money e.g. gold and silver coins (they are also used in jewelry so have independent value). Commodity money can be of two types-
   (a) ***Full-bodied money***- When commodity itself circulates as money then it is known as full bodied money. Monetary value = non-monetary value of full bodied money.
   (b) ***Representative full bodied money***- When paper money that represents a claim to a specific quantity of some commodity circulates as money then it is known as representative full bodied money e.g. gold certificates. Here the non-monetary value of the actual item exchanged is negligible but is more conveniently used as money.

2. **Fiat Money**: Anything that is money by legal tender and is unbacked by any commodity like unbacked paper money or token coins is called fiat money. It has no value as a commodity and doesn't represent a claim to any physical commodity. It is backed only by its general acceptance by society as a medium of exchange.

Physical Properties of Money

1. **Portability**- Money should be portable to make transactions easier. The easier it is to carry around, the more effective it is as a medium of exchange. Money should generally be a substance that is valuable in small quantities.
2. **Divisibility**- To be able to do transactions of various sizes, money should be made of a commodity that is divisible into smaller units. Gold and silver can be minted in the form of small coins thus facilitate small transactions.
3. **Durability**- Money should not wear out in use and should not depreciate quickly when not in use i.e. it should be durable.
4. **Recognizable Value**- It should be easy for people engaged in exchange to agree to the value of good used as money, it should have value recognized by all. The modern currency has complicated engraving, rare papers and ink to avoid counterfeiting of fiat currency.

The Evolution of Banks

Banks are financial institutions that accept deposits and make loans.

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During the middle ages, gold and silver (specie) were used as full bodied medium of exchange. To save the specie from theft, fire etc. goldsmiths offered accommodations for this specie in their strongboxes.

Initially the goldsmiths only provided safekeeping for specie deposits and charged depositors a fee for the service. Gradually it was realized that it wasn't necessary for depositors to go to the goldsmith every time one needed to make some transaction, they could rather use a written order to pay for goods and services. The written order would state that the depositor was authorizing the goldsmith to pay specified amount to the person named on the order. This reduced transaction costs. The person who received the payment had two options either withdraw the gold and put in his own account or use the written order to pay to someone else. But the same written order could be used only if the value of purchase was the same, this limited the number of times this "check" would change hands.

Another innovation in this regard was the bank note- a document written by earlier goldsmiths promising to pay sum specie to the bearer on demand. These were issued in convenient denominations to foster transactions. These bank notes were like modern day checks and currency the basic difference being that these were issued by banks (goldsmiths) rather than government. Bank notes have one advantage over checks i.e. they are issued in convenient denominations and are easily used in second transactions which allows them to circulate for longer. However one disadvantage is that they are more prone to theft as the bank notes pay the bearer on demand.

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A typical T-account of a bank issuing bank notes looks like the following:

Assets	Liabilities
Reserves (gold in vault) $100	Bank Notes $25
	Demand Deposits $75

Fractional Reserve Banking

Initially the goldsmiths only acted as depositories maintaining 100% reserves (reserves= total value of outstanding bank notes and demand deposits) and earning in the form of service fee. However they realized that most of the specie in their vaults was never withdrawn, it sat idle and bank notes and demand deposits circulated as money. So they adopted the **fractional reserve banking** method where they maintained only a fraction of the bank notes and demand deposits as reserves and gave out the rest as loans and earned extra profits in terms of the interest on loans. They issued more bank notes than was there gold in the vaults.

The balance sheet now looked like the following:

Assets	Liabilities
Reserves (gold in vault) $20	Bank Notes $25
Loans $80	Demand Deposits $75

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The money supply in the absence of banks was $100 of gold which stayed $100 in 100% reserve banking system but was in the form of bank notes and demand deposits. In case of fractional reserve system an additional $80 in the form of gold was created by the bank when it gave out loans. Now total money supply became $180. This gold is again kept with the goldsmiths/banks which keep a part of it (say 20%) and lend out the rest.

Assets	Liabilities
Reserves (gold in vault) $20+$80	Bank Notes $25
Loans $80	Demand Deposits $75+$80= $155

The bank now keeps lends out 80% of $80= $64 and keep the rest as reserves. The process continues until the bank is fully loaned out.

Assets	Liabilities
Reserves (gold in vault) $100	Bank Notes $25
Loans $400	Demand Deposits $475

The bank still has $100 of gold in its reserves, but with 20% reserve requirement it has been able to create money supply equal to $500. This means that incase all the depositors claim redemption on the same day, the bank wouldn't be able to honor them and would be **illiquid** i.e. it doesn't have enough liquid assets to honor its obligations. A bank is said to be **bankrupt** when the value of its liabilities exceeds its assets. Therefore a

bank can be illiquid but not bankrupt and can be bankrupt without being illiquid. When a bank faces a long line of depositors and note holders demanding redemption, it is called a **run on the bank**. This has a potential threat even to healthy banks because under fractional reserve banking no bank can actually honor all its obligations if all are redeemed at the same time.

Financial markets link savers to borrowers- either directly or indirectly.

- ☑ **Direct Finance**: It occurs when savers lend funds directly to borrowers.
- ☑ **Indirect Financing**: When a third party stands between the borrower and the lender it is called indirect financing and the third party is known as financial intermediary. This intermediary accumulates funds from various savers and lend those to borrowers e.g. banks. In this respect, credit unions, life insurance companies also play the role of financial intermediary.

There exists a major difference between brokers and financial intermediaries i.e. the broker facilitates the transaction without personally creating a financial instrument unlike banks which themselves give loans to borrowers.

Banks profit on the difference between interest rates they pay on deposits and that they collect on loans. They repackage depositors' savings into loans.

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Importance of Intermediation

1. **Borrow short lend long**- Banks match up savers who want to lend funds for short period with borrowers who want to borrow for long periods. The bank thus borrows from depositors for short period and lend for long periods. In case it fails to honor the demand of its depositors it becomes illiquid. It is possible for the banks to borrow short and lend long because:

(a) A bank seeks diversified pool of depositors so that no one depositor is likely to cause liquidity problem. Large number of depositors also enables the banks to stabilize withdrawals and reducing the odds of withdrawal on one particular day.

(b) It maintains a fraction of reserves to meet withdrawal demands and also has various lines of credit available from other banks and the central bank which can be used at the time of need.

(c) Banks make the long term loans only to a small fraction of borrowers which implies that most of the assets of the banks are liquid.

2. **Pooling**- Banks pool many small deposits to make relatively large loans to borrowers.

3. **Risk reduction**- Banks are capable of lending to a large diversified group of borrowers which an individual is not capable of doing. Thus by keeping one's money with the banks as deposits enables him to reduce the risk of default he faces while lending to a borrower directly. In the presence of an intermediary, each depositor faces only a small risk because

default by one or a few individuals will have relatively little impact on banks and its depositors.

4. **Reducing transaction costs**- Financial intermediaries economize on transaction costs

(a) Time and legal costs associated with mortgage loans

(b) Cost of checking creditworthiness of a potential borrower and

(c) Cost associated with monitoring the borrower i.e. to check that the payments are current and the borrower stays in good financial health.

Banks have the ability, technology, better knowledge, efficiency and specialization which enable it to reduce transaction costs associated with loan making.

CHAPTER – 1.2

MEASUREMENT OF MONEY

There is no unique definition of 'money', either as a concept in economic theory or as measured in practice. Money is a means of payment and thus a lubricant that facilitates exchange.

Definitional issues with Money

While defining money, we should know that there is a difference between conceptualization of money and measurement of money. In fact, former precedes the latter. There are two approaches of defining money: **a priori or theoretical approach** and **empirical approach.**

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1. In theoretical approach, money is first conceptualized in terms of certain functional and institutional attributes and then the corresponding measure of money is obtained by aggregating the financial assets which possess these attributes.

   In empirical approach, we directly arrive at a measure of money as an aggregate of financial assets which when introduced in certain functions, gives the best result.
2. The theoretical approach is more analytical and scientific whereas, the empirical approach is 'the antithesis of scientific procedure'. The former develops an appropriate concept of money as an analytical entity and then suitably measures money, thus clearly distinguishing between conceptualization and measurement. The latter does not.

Attributes with which to conceptualize money

1. Money as a **Medium of Exchange:** Money facilitates transactions. Without money, all transactions would have to be conducted by **barter**, which involves direct exchange of one good or service for another. The drawback of **barter system** is that in order to obtain a particular good or service from a supplier, one has to possess a good or service of equal value, which the supplier also desires. In other words, in a barter system, exchange can take place *only* if there is a **double coincidence of wants** between two transacting parties. Money eliminates the double coincidence of wants problem by serving as a medium of exchange.
2. Money as a **Unit of Account:** Money also functions as a unit of account, providing a *common measure of the value* of

goods and services being exchanged. Knowing the value or price of a good, in terms of money, enables both the supplier and the purchaser of the good to make decisions about how much of the good to supply and how much of the good to purchase.

3. Money as a **Store of Value:** In order to be a medium of exchange, money must hold its value over time. If money could not be stored for some period of time and still remain valuable in exchange, it would not solve the double coincidence of wants problem and therefore would not be adopted as a medium of exchange. Money may not be the best store of value because it depreciates with inflation. However, money is very **liquid** and is readily accepted everywhere.

Measurement of Money

Monetary Aggregates

M1 = currency (with public)
+ demand deposits
+ other deposits with RBI

M2 = M1
+ savings deposit with post office savings bank

M3 = M2
+ time deposits

M4 = M3
+ all deposits with post office savings organization

The existing monetary aggregates **M1-M4** were revisited by The Working Group on Money Supply: Analytics and Methodology of

Compilation in 1998. (Chairman – Y.V. Reddy). This was because during financial liberalization, banks were resorting to non-traditional sources of funds under increasing competitive pressures. Financial institutions were operating differently. Hence, **M1-M4** was not in appropriate.

New monetary and liquidity aggregates

Differentiated on the nature and functioning of institutions issuing such instruments.

NM0 = Monetary Base = Currency in circulation + Bankers' deposits with the RBI + 'Other' deposits with the RBI.

NM1 = Currency with the public + Demand deposits with the banking system + 'Other'deposits with the RBI.

NM2 = NM1 + Short-term time deposits of residents (including and upto the contractual maturity of one year) + time liability portion of savings deposits + Certificate of Deposits.

NM3 = NM2 + Long-term time deposits of residents (contractual maturity of over one year) + Call/Term funding from financial institutions and call borrowings from non depository financial corporations.

L1 = **NM3** + All deposits with the post office savings bank (excluding National Savings Certificates).

L2 = **L1** +Term deposits with term lending institutions and refinancing institutions (FIs) +Term borrowing by FIs + Certificates of deposit issued by FIs.

L3 = **L2** + Public deposits of nonbanking financial companies.

Key features of new monetary and liquidity aggregates

- NM0 is essentially the monetary base, compiled mainly from the balance sheet of the Reserve Bank of India. NM1

purely reflects the non-interest bearing monetary liabilities of the banking sector; NM2 includes besides currency and current deposits, saving and short-term deposits reflecting the transactions balances of entities. NM3 was redefined to reflect additionally to NM2 the call funding that the banking system obtains from other financial institutions.

- NM1, NM2 and NM3 are used to distinguish the new monetary aggregates [as proposed by the Working Group on Money Supply: Analytics and Methodology of Compilation (WGMS) (Chairman: Dr. Y.V. Reddy), June 1998] from the existing monetary aggregates. NM2 and NM are based on the **residency concept** and hence do not directly consider non-resident foreign currency repatriable fixed deposits. Residency essentially relates to the country in which the holder has a centre of economic interest.
- Only non-resident repatriable foreign currency fixed deposits are excluded from deposit liabilities and treated as **external liabilities.** Non-resident rupee-denominated deposits have been retained as a part of deposit and monetary aggregates.
- Commercial banks have in recent years been investing in securities such as commercial paper, shares and debentures issues by the commercial sector, which are not reflected in the conventional credit aggregates. The **definition of bank credit has been broadened** to include so called 'non-SLR' investments.
- In the new monetary aggregate NM3, **capital account** consists of paid-up capital, revaluations and reserves.

- The Working Group defined money as a set of financial aggregates whose variations could impact aggregate economic activity.
- **Foreign currency liabilities** of banks have been identified explicitly which has helped in more accurate compilation of banks' net foreign assets.
- **Postal deposits** have been excluded from monetary aggregates and are a part of liquidity aggregates. This was to keep the differentiation criterion (stated above) intact. Also, the **deposit liabilities of financial institutions** were made a part of broader liquidity aggregates.
- After deregulation, since the share of **non depository corporations** has been increasing, therefore liquidity aggregates were introduced so as to provide broader magnitudes of monetary and near money liabilities issued by non-banking financial institutions.

Money Stock Measures: Evolution of Methodology of Compilation (Few Remarks)

1. New monetary aggregates are compiled based on the data from the scheduled commercial banks, cooperative banks, urban cooperative banks and the post offices. The coverage of co-operative banks has increased over time. The First Working Group (FWG) considered only commercial and state cooperative banks while the Second Working Group (SWG) extended the coverage to central cooperative banks and primary co-operative banks consisting of urban co-operative banks.
2. Working Group on Money Supply (WGMS) recommended a break-up of time deposits into CDs and

other time deposits on the basis of maturity structure partitioned at one year.

3. Post Office Deposits were included in the monetary aggregates by the SWG. The WGMS recommended that these should be part of liquidity aggregates.
4. On the establishment of National Bank for Agriculture and Rural Development (NABARD) on July 12, 1982, certain assets and liabilities of the RBI were transferred to NABARD, necessitating some reclassification of aggregates on the sources side of money stock since that date. The WGMS recommended the reclassification of the RBI's refinance to NABARD as credit to commercial sector rather than as claims on banks as had been the practice.
5. Certain foreign securities, e.g., IBRD shares, Commonwealth bonds etc. which were part of RBI's claims on Government were reclassified as part of its foreign assets by the SWG.
6. Banks' net lending to Primary Dealers, net of their call borrowings from PDs, are part of net inter-bank assets under the present reporting format. However, as the banking sector in money supply excludes PDs, this item was included as part of credit from the banking system by the WGMS.
7. The WGMS has bifurcated the nonmonetary liabilities of the banking sector into the capital account and other items (net).
8. Since July 1996, foreign currency assets are being valued at the exchange rate prevailing at the end of every week.

Such revaluation has a corresponding effect on Reserve Bank's net nonmonetary liabilities (capital account).

Weighted Monetary Aggregates

The conventional monetary measure is **simple sum monetary aggregates.** They are derived by simple summation over relevant assets. However, there are certain problems associated with it.

- » It gives equal weights to all components which lead to bias and freakishness and is inconsistent with economic theory.
- » It assumes that the components included in them are perfect substitutes, i.e., the elasticity of substitution between any two pair of components is infinite. This is absurd.

A correct way is to give weights to the various components reflecting relevant value-shares. Each monetary asset has a certain degree of 'moneyness' associated with it. Hence, we should do a weighted sum of the monetary assets while deriving monetary aggregates, with weights being the 'degree of moneyness'. This is **weighted sum monetary aggregates.**

CHAPTER – 1.3

MONEY SUPPLY PROCESS

Balance Sheet of Banks and Multiple Deposit Creation

Total Assets = Total Liabilities + Net Worth

Reserves = Required Reserves (Legally mandated reserves) + Excess Reserves

A simple T-account is as follows:

Balance Sheet of a Bank with Required Reserve Ratio of 20%			
Balance Sheet of Bank 1			
ASSETS		**LIABILITIES**	
Reserves Required 100 Excess 0	100	Deposits	500
Loans	400	Net Worth	10
Building	10		
Total	**510**	**Total**	**510**

Deposits = 500 and required reserve ratio = 20%. Hence, required reserves = 20% of 500 = 100. In this example, bank is not holding any excess reserves.

Before moving ahead, we make the following **assumptions**:

1. All deposits are checkable deposits
2. The reserve requirement is 20% of the deposits
3. Deposits are the only form of money
4. Banks do not want to hold any excess reserves
5. Loans are made only to private individuals and companies

How does a Bank respond to changes in Reserves from within the Banking system?

Situation – Your uncle has given you a gift of 1 that is drawn from her account at Bank 1. You deposit the check in your account in Bank 1.

Part A shows the Balance Sheet of Bank 1 after it receives new deposit of 1. Part B shows the changes in the bank's deposits,

reserves and loans. Since the new deposit is now 501, hence the required reserves will be 20% of 501 = 100.2. The additional 0.8 is Excess Reserves.

Effect of a deposit of 1 on a Bank			
A - Balance Sheet of Bank 1 after receiving a deposit of 1.			
ASSETS		**LIABILITIES**	
Reserves Required +100.2 Excess +0.8	101	Deposits	501
Loans	400	Net Worth	10
Building	10		
Total	**511**	**Total**	**511**
B - Changes in Balance Sheet of Bank 1 immediately after receiving deposit of 1			
ASSETS		**LIABILITIES**	
Reserves Required +0.2 Excess +0.8	+1	Deposits	+1
Loans	0	Net Worth	0
Building	0		
Total	**+1**	**Total**	**+1**

What does Bank do with Excess Reserves?

Banks lend out the excess reserves of 0.8. So, the loans are now 400+0.8= 400.8. The changes after banks have expanded loans are shown below.

Effect of a deposit of 1 and the resultant expansion of loans at a Bank			
A - Balance Sheet of Bank 1 after receiving a deposit of 1 and making loans			
ASSETS		**LIABILITIES**	
Reserves Required 100.2 Excess 0	100.2	Deposits	501
Loans	400.8	Net Worth	10
Building	10		
Total	**511**	**Total**	**511**
B - Changes in Balance Sheet of Bank 1 after receiving deposit of 1 and making loans			
ASSETS		**LIABILITIES**	
Reserves Required +0.2 Excess 0	+0.2	Deposits	+1
Loans	+0.8	Net Worth	0
Building	0		
Total	**+1**	**Total**	**+1**

What happens to BANK 2's Balance Sheet?

Since the uncle gave the check and had an account in Bank 2, hence Bank 2 will lose out on a deposit of 1. So, its required reserves are 20% of (500-1) = 99.8. Since Bank 2 lost a deposit of 1 and hence lost the reserves of 1, its excess reserves go down (by 0.8).

Effect of a withdrawal of 1 on a Bank			
A - Balance Sheet of Bank 2 immediately after losing a deposit of 1.			
ASSETS		**LIABILITIES**	
Reserves Required 99.8 Excess -0.8	99	Deposits	499
Loans	400	Net Worth	10
Building	10		
Total	**509**	**Total**	**509**
B - Changes in Balance Sheet of Bank 1 immediately after receiving deposit of 1			
ASSETS		**LIABILITIES**	
Reserves Required -0.2 Excess -0.8	-1	Deposits	-1
Loans	0	Net Worth	0
Building	0		
Total	**-1**	**Total**	**-1**

Since excess reserves can't be negative, Bank 2 will contract its loans and the changes are shown below. Basically, Bank 2 is decreasing its lending to gain reserves of 0.8.

Effect of a withdrawal of 1 and resulting contraction of loans at a Bank			
A - Balance Sheet of Bank 2 after losing a deposit of 1 and adjusting loans			
ASSETS		**LIABILITIES**	
Reserves Required 99.8 Excess 0	99.8	Deposits	499
Loans	399.2	Net Worth	10
Building	10		
Total	**509**	**Total**	**509**
B - Changes in Balance Sheet of Bank 1 immediately after receiving deposit of 1			
ASSETS		**LIABILITIES**	
Reserves Required -0.2 Excess 0	-0.2	Deposits	-1
Loans	-0.8	Net Worth	0
Building	0		
Total	**-1**	**Total**	**-1**

Conclusion: An increase in deposits and reserves leads to excess reserves, which a bank uses to increase loans. A decrease in deposits and reserves leads to a shortfall of reserves, which a bank will meet by reducing loans or borrowing reserves.

How does Banking System Respond to Infusions and Contractions of Reserves?

The Central Bank can alter the total banking system reserves and deposits by –

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1. Lending reserves to banks through the discount window
2. Engaging in open market operations

Open Market PURCHASES – Multiple Deposit Expansion

Situation – Central bank purchases government securities worth 1. Its assets and liabilities rise by 1. (See A below) The Central Bank pays the securities dealer, who deposits it in Bank 1, where deposits now increase by 1. Bank 1 itself sends the check to the Central Bank, where it is deposited in bank 1's reserve account, increasing its reserves by 1.

NOTE: These changes have occurred before Bank 1 has lent out any of its 0.8 in excess reserves.

A - Changes in balance sheet of CENTRAL BANK immediately after Open Market Purchases of 1			
ASSETS		**LIABILITIES**	
Domestic Government Bonds	+1	Reserves	+1
B - Changes in Balance Sheet of BANK 1 immediately after gaining 1 through Central Bank's Open Market Purchase			
ASSETS		**LIABILITIES**	
Reserves Required +0.2 Excess +0.8	+1	Deposits	+1
Loans	0	Net Worth	0
Building	0		
Total	**+1**	**Total**	**+1**

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Excess reserves of 0.8 by Bank 1 is given out as loans as shown below. This 0.8 ends up being deposited in Bank 2, where deposits and reserves increase by this amount. Bank 2 now has 0.64 in excess reserves. Its required reserves increase by 20% of 0.8 = 0.16.

Effect of the expansion of loans at Bank 1 and initial effect on bank 2			
A – Changes in the balance sheet of Bank 1 after open market purchase of 1 and adjusting loans			
ASSETS		**LIABILITIES**	
Reserves Required +0.2 Excess 0	+0.2	Deposits	+1
Loans	+0.8	Net Worth	0
Building	0		
Total	**+1**	**Total**	**+1**
B - Changes in Balance Sheet of Bank 2 immediately after receiving deposit of 0.8			
ASSETS		**LIABILITIES**	
Reserves Required +0.16 Excess +0.64	+0.8	Deposits	+0.8
Loans	0	Net Worth	0
Building	0		
Total	**+0.8**	**Total**	**+0.8**

Now Bank 2 will lend out the excess reserves of 0.64. This 0.64 ends up being deposited in Bank 3, where deposits and reserves

increase by this amount. Bank 3 now has (0.64 – 20% of 0.64 = 0.512) in excess reserves.

Effect of the expansion of loans at Bank 2 and initial effect on bank 3			
A – Changes in the balance sheet of Bank 2 after deposit of 0.8 and adjusting loans			
ASSETS		**LIABILITIES**	
Reserves Required +0.16 Excess 0	+0.16	Deposits	+0.8
Loans	+0.64	Net Worth	0
Building	0		
Total	**+0.8**	**Total**	**+0.8**
B - Changes in Balance Sheet of Bank 2 immediately after receiving deposit of 0.8			
ASSETS		**LIABILITIES**	
Reserves Required +0.128 Excess +0.512	+0.64	Deposits	+0.64
Loans	0	Net Worth	0
Building	0		
Total	**+0.64**	**Total**	**+0.64**

This process now goes on and on.

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The Simple Deposit Multiplier

The increase in reserves by 1, leads to total banking deposits rising by 5. The lending process above continues till all banks are loaned up so that the excess reserves are zero.

Summary of Deposit Expansion Process Across Banks			
	Change in Assets		Change in Liabilities
Bank	**Change in reserves**	**Change in loans**	**Change in Deposits**
1	+0.2	+0.8	+1
2	+0.16	+0.64	+0.8
3	+0.128	+0.512	+0.64
4	+0.1024	+0.4096	+0.512
. . .	. . .	. . .	. . .
TOTAL	**+1**	**+4**	**+5**

Calculations

ΔD = Change in Deposits

ΔR = Change in Reserves = +1

rr = Reserve Requirement Ratio = 20%

ΔD X rr = ΔR

Substituting the values, we get **ΔD =** (1/20%) * (+1) = +5

Alternatively,

ΔD = 1 + 0.8 + 0.64 + 0.512 + …

ΔD = 1 + (0.8)*1 + (0.8)*(0.8)*1 + …

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This is an infinite G.P.
Hence **ΔD =** (1/1-0.8) = 5
(1/rr) is known as the simple deposit **multiplier**. In this case it is (1/20%) = 5.

Carry out the above process for Open Market SALES – Multiple Deposit Contraction. The starting point is given below.

A - Changes in balance sheet of CENTRAL BANK immediately after Open Market SALES of 1			
ASSETS		**LIABILITIES**	
Domestic Government Bonds	-1	Reserves	-1
B - Changes in Balance Sheet of BANK 1 immediately after gaining 1 through Central Bank's Open Market Purchase			
ASSETS		**LIABILITIES**	
Reserves Required -0.2 Excess -0.8	-1	Deposits	-1
Loans	0	Net Worth	0
Building	0		
Total	**-1**	**Total**	**-1**

Calculations
ΔD = Change in Deposits
ΔR = Change in Reserves = -1
rr = Reserve Requirement Ratio = 20%
ΔD X rr = ΔR
Substituting the values, we get **ΔD =** (1/20%) * (-1) = -5

Alternatively,
ΔD = -1 - 0.8 - 0.64 - 0.512 - …
ΔD = -1 - (0.8)*1 - (0.8)*(0.8)*1 - …
This is an infinite G.P.
Hence **ΔD =** (-1/1-0.8) = -5
(1/rr) is known as the simple deposit **multiplier**. In this case it is (1/20%) = 5. (Here there is deposit contraction by 5 times)

A General Model of Money Creation

Money Stock (M) = Currency (C) + Deposits (D)
c^d = Desired Currency to deposit ratio. Public desire to hold currency in proportion to deposits.
Hence, **$C = c^d * D$**
Total reserves (R) = Excess Reserves (ER) + Required Reserves (RR)
rr = Required reserve ratio
e^d = Desired excess reserve ratio = They are proportional to deposits.
Hence, **$RR = rr * D$** and **$ER = e^d * D$**
Since R = RR + ER, implies, **$R = rr*D + e^d*D = (rr+ e^d)*D$**
Monetary Base (high powered money) **MB = C + R**

Calculating Complete Deposit Multiplier
$MB = C + R = c^d * D + (rr+ e^d)*D = (c^d + rr + e^d)*D$
Hence, **$D = [1/(c^d + rr + e^d)] * MB$**
This implies, change in deposits = **$\Delta D = [1/(c^d + rr + e^d)] * \Delta MB$**
$[1/(c^d + rr + e^d)]$ is known as the Complete Deposit Multiplier.

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Calculating Complete Currency Multiplier

$C = c^d * D = c^d * [1/(c^d + rr + e^d)] * MB = [c^d/(c^d + rr + e^d)] * MB$

This implies, change in currency = **$\Delta C = [c^d /(c^d + rr + e^d)] * \Delta MB$**

$[c^d/(c^d + rr + e^d)]$ is known as the Complete Currency Multiplier.

Calculating Complete Money Multiplier

$M = C + D = [\{c^d/(c^d + rr + e^d)\} * MB] + [\{1/(c^d + rr + e^d)\} * MB]$

Hence **$M = \{(1+c^d)/(c^d + rr + e^d)\} * MB$**

This implies, change in money = **$\Delta M = [(1+c^d)/(c^d + rr + e^d)] * \Delta MB$**

$[(1+c^d)/(c^d + rr + e^d)]$ is known as the Complete Money Multiplier.

Money Supply Equation

Money Supply**= $[(1+c^d)/(c^d + rr + e^d)] * MB$**

Determinants of Money Supply

Central Bank	Banking System	Public
- By changing the monetary base - By changing the required reserve ratio	- Market interest rate on Loans - Risk of deposit Withdrawals - Interest rate on Borrowed Reserves	- Interest rate on Checkable Deposits - Fees on Checkable Deposits - Income - Probability of Bank Failure - Illegal Activity

Central Bank Determinants of Money Supply

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1. Monetary base (MB) – Increase (Decrease) in monetary base by open market purchases (sales) leads to an increase (decrease) in the money supply.
2. Required Reserve Ratio (rr) – Increase in rr reduces the money multiplier and leads to reduction in money supply, decrease in rr has opposite effect.

Banking System Determinants of Money Supply

1. Market interest rate on Loans – This influences $\mathbf{e}^{\mathbf{d}}$ because these interest rates are the opportunity costs of holding excess reserves. High market interest rate on loans implies fall in $\mathbf{e}^{\mathbf{d}}$ which results in increase in money supply.
2. Risk of deposit withdrawals – Higher risk, greater $\mathbf{e}^{\mathbf{d}}$ and hence lower money supply.
3. Interest rate on Borrowed reserves – When the interest rate paid on borrowed reserves rise, $\mathbf{e}^{\mathbf{d}}$ increases which reduces the compete deposit multiplier and the money supply.

Public's Determinants of Money Supply

1. Increase in interest rate on Checkable Deposits, results in decline in attractiveness of holding money, which reduces $\mathbf{c}^{\mathbf{d}}$ which increases money supply.
2. Fees on checkable deposits are cost of holding money in the form of deposits, so if they increase, the $\mathbf{c}^{\mathbf{d}}$ rises and hence the money supply falls.
3. $\mathbf{c}^{\mathbf{d}}$ declines with income. Those with higher incomes are sophisticated users of banking system and rely less on currency. So, higher income implies larger money supply.

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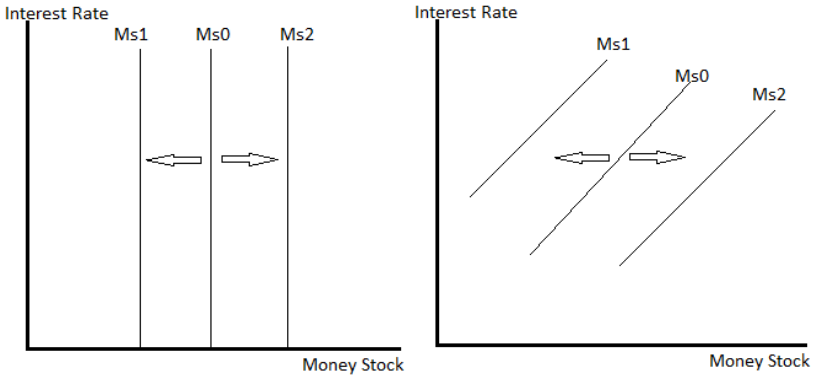
4. If the probability of bank failure rises, people will favour currency and money supply will fall.
5. Increase in illegal activity decreases the money supply by increasing the currency to deposit ratio.

The Money Supply Curve

Exogenous Money Supply: Changes in interest rates do not alter the currency to deposit ratio or the desired excess reserve ratios of banks.

Endogenous Money Supply: The determinants of money supply, most probably the currency to deposit ratio and the desired excess reserve ratio are endogenous and depend on economic variables like interest rates. Money supply is upward sloping in this case because as the interest rate rises, excess reserves fall, and the amount of money in the economy increases due to the complete money multiplier. Also, higher interest rates lead to a lower currency to deposit ratio, which works through the complete money multiplier to further increase the money supply.



The diagram on the left shows exogenous money supply and on the right shows endogenous money supply curves. The initial curves in both cases are Ms0.

- Increase in **MB**, decrease in **rr**, decrease in $\mathbf{c^d}$, decrease in $\mathbf{e^d}$ shifts the money supply curve to the right to Ms2 in both cases.
- Decrease in **MB**, increase in **rr**, increase in $\mathbf{c^d}$, increase in $\mathbf{e^d}$ shifts the money supply curve to the left to Ms1 in both cases.

MONEY MULTIPLIER APPROACH (as discussed by N. Jadhav)

M = m(.)*H

Where, M = nominal money stock, H = nominal reserve money, m(.) = money multiplier.

H = C + R

Where, C = Currency held by general public, R = Bank Reserves

Broad money multiplier

m(.) = M/H

= (C + DD + TD)/ (C + R)

$$= \frac{C+DD+TD}{C+r(DD+TD)}$$

$$= \frac{1+\frac{C}{DD}+\frac{TD}{DD}}{\frac{C}{DD}+r(1+\frac{TD}{DD})}$$

Dividing numerator and denominator by **DD**

$$= \frac{1+c+t}{c+r(1+t)}$$

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Where, M = C + DD + TD, DD = Demand Deposits, TD = Time Deposits, r = reserve to deposit ratio, t = time deposit to demand deposit ratio, c = currency to demand deposit ratio.

Hence, **M =** $\frac{1+c+t}{c+r(1+t)}$ ***H**

Adjustment

r_t = current Cash Reserve Ratio (CRR)

r_o = Initial or benchmark CRR

D = demand and time liabilities relevant for computation of the CRR

IR = Increment reserve requirements

DF = net CRR default for all commercial banks

Adjustment = $(r_t - r_o)$*D + IR – DF

H* = H – Adjustment factor

A fairly general model may be formulated as:

M = $\frac{1+c+t}{c+r(1+t)}$ ***(H_o + DF – ER)**

Where, DF = Discretionary finance provided, ER = Excess reserves, Ho = Non-borrowed reserve money

Changes in Variable	Money Supply Responses
Rise in (C/DD) ratio (c)	Contraction
Rise in (TD/DD) ratio (t)	Expansion
Enhancement in reserve ratio (r)	Contraction
Rise in non borrowed reserves (H*)	Expansion
Enhancement in discretionary finance (DF)	Expansion

Rise in excess reserves holdings of banks (ER)	Contraction

Critique of Money Multiplier approach (by Goodhart)

1. It is based on an identity, i.e., a tautology, which may be analytically convenient but what it offers is a description of movements in money stock rather than a behavioral theory of its determinants.
2. Even in general form, it is an equilibrium condition rather than a money supply function. The process involved is rather mechanical.
3. The theory of determination of money stock ought to be treated as one branch of the more general theory of portfolio adjustment in response to relative prices changes. The money multiplier identity short circuits this approach by taking the reserve money stock as given.
4. No steps are taken to determine the level of reserve money and are fixed by the authorities. So, the reserve money is a target rather than an exogenous variable.

QUESTIONS

1. Credit cards are often used to pay for items purchased at retailing outlets. Are credit cards "money"? *(Baye and Jansen – Chapter 1)*
2. Write short notes on (a) Fractional reserve Banking (b) Weighted Monetary Aggregates
3. Why were the monetary aggregates revised by The Working group on Money Supply and what were the recommendations? Highlight the key features of the new monetary aggregates.

4. What is the effect on a bank's balance sheet of a withdrawal of $10,000? Assume the required reserve ratio is 5%, the bank held no excess reserves at the time of the withdrawal, and the bank is unable to borrow reserves. *(Baye and Jansen – Chapter 14)*
5. What is the total contraction of deposits, loans, and reserves in the entire banking system if the required reserve ratio is 5% and the Fed makes an open market sale of $150,000? What happens to the money stock? Remember, we are assuming banks do not want to hold any excess reserves, the public does not hold cash, and the banks do not borrow reserves. *(Baye and Jansen – Chapter 14)*
6. What are the changes in deposits, currency holdings, and the money stock for an open market sale of $100,000? The required reserve ratio is 10%, the desired excess reserve ratio is 5%, and the desired currency to deposit ratio is 25%. *(Baye and Jansen – Chapter 14)*
7. Assuming other things constant, determine the impact of each of the following events on the money supply: (a) The Central bank lowers the required reserve ratio. (b) The interest rate paid on deposit rises. (c) The Central bank raises the discount rate. *(Baye and Jansen – Chapter 14)*
8. What is the impact of open market sales on the money supply? Explain graphically. Mention the assumptions you make in your analysis. (Hint: Consider two cases – Exogenous and Endogenous Money Supply)
9. Explain the various determinants of money supply. Explain in each case, how they affect money supply.

10. How can you make the money multiplier invariant to changes in cash reserve requirement? (Hint: Jadhav's Adjustment Factor)
11. Differentiate between exogenous and endogenous money supply curves. What impact will a rise in required reserve ratio have on these curves?
12. Weighted monetary aggregates have deficiencies of operationalization rather than conceptualizing as compared to simple sum aggregates. Discuss.
13. Define money according to the a priori or theoretical approach and empirical approach. Which do you think has a greater analytical appeal and why?
14. Describe a fairly general model of money multiplier incorporating adjustment on account of (a) required reserve ratio changes (b) excess reserves held by the banks (c) discretionary finance provided by the central bank.
15. What are the factors that affect public's desired currency to deposit ratio? Explain.

TOPIC – 2

CHAPTER – 2.1

FINANCIAL ASSETS AND FINANCIAL MARKETS

Tangible and Financial Assets

A tangible asset is one whose value depends on particular physical properties. Example – Land, buildings, machineries, etc.
Intangible assets represent claims to some future benefit. Example – Financial Assets like bonds.

Debt and Equity Instruments

If the claim that the holder of the financial asset has is a fixed amount, then that financial asset is a debt instrument. Example – Bonds in which there are fixed payments.

When the issuer of the financial asset is obligated to pay the holder an amount based on the earnings, then that financial asset is an equity instrument. Example – A partnership share in a business, common stocks, etc.

Risks associated with investing in financial assets

Credit Risk – It is the risk that the issuer or the borrower will default on the obligation.

Foreign Exchange Risk – When financial assets are not denominated in a certain currency, there is a risk that the exchange rate will change, resulting in less of that currency.

Purchasing Power Risk – There is uncertainty associated with the purchasing power of the cash flow received, i.e., how much can be purchased with the cash. There are chances of inflation.

Economic functions of financial assets

1. To transfer funds from those who have surplus funds to invest to those who need funds to invest in tangible assets.
2. To transfer funds in such a way, so as to redistribute the risks associated with the cash flow generated by tangible assets among those seeking and those providing the funds.

Financial markets

A financial market is a market where financial assets are exchanged. The economic functions of financial markets are:

1. To improve the price discovery
2. Enhance liquidity
3. Reduce the cost of transacting

Classification of financial markets

1. **By nature of claim –** Debt market, Equity market
2. **By maturity of claim –** Money market, Capital market
3. **By seasoning of claim –** Primary market, Secondary market
4. **By immediate/future delivery –** Spot market, Derivatives market
5. **By organizational structure –** Auction market, OTC (Over the counter) market, Intermediated market.

Globalization of financial markets

This means integration of financial markets throughout the world into an international financial market.

Factors that have made this possible:

1. Deregulation and liberalization of markets
2. Technological improvements
3. Increased institutionalization of financial markets

Global financial markets can be classified into Internal (national market) and External markets (international/offshore market). Internal markets can be further classified into domestic and foreign markets.

Derivative markets

The major function is to provide ways to control risk. The advantages (over cash markets) are:

1. Lower transaction costs
2. Greater liquidity
3. Faster speed at which transaction can be completed.

We'll look into derivative instruments in detail shortly.

CHAPTER – 2.2

FINANCIAL INNOVATION AND ASSET SECURITIZATION

Services provided by financial institutions

1. Transform the financial assets acquired through the market and constitute them into a different and more widely preferable type of asset. This is done by **financial intermediaries.**
2. Exchange of financial assets on behalf of customers.
3. Exchange of financial assets for their own accounts.

4. Providing investment advice to other market participants.
5. Managing the portfolios of other market participants.
6. Assisting in creation of financial assets for their customers and then selling those to other market participants.

Role of financial intermediaries

The main role is to transform the financial assets which are less desirable to most people into other financial assets, which are widely preferred by people. This transformation requires four functions:

1. Providing maturity intermediation – Transforming longer term asset into shorter term one and vice-versa, so as to cater to the needs of all types of people.
2. Reducing risk (via diversification) – Transforming more risky assets to less risky ones by pooling in large variety of assets.
3. Lower transaction costs – Costs of writing loan contracts, and information processing costs are low.
4. Providing payments mechanism – Allows payments not only through cash, but also through checks, debit cards, etc.

Financial innovation

They can be categorized into three broad categories:

1. Market broadening instruments – increase liquidity of markets, attract new investors, offer new opportunities for borrowers.
2. Risk management instruments – reduce risks.

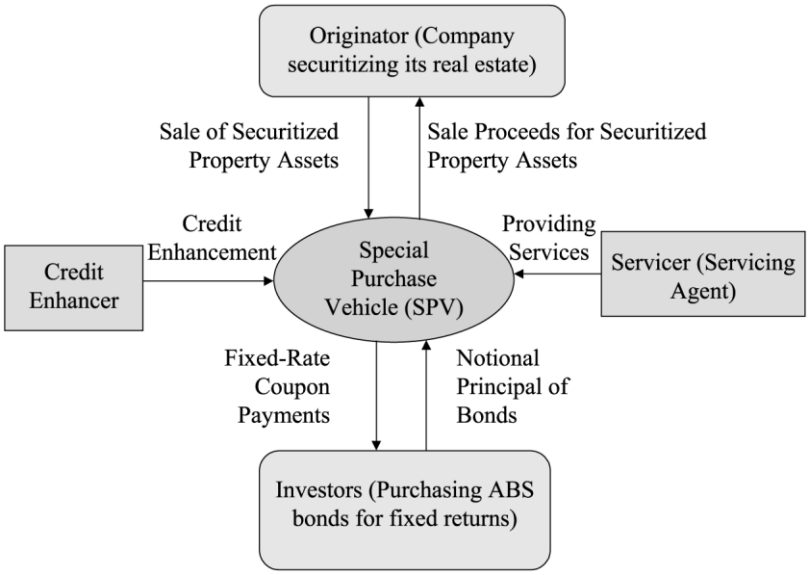
3. Arbitraging instruments and processes – enables investors and borrowers to take advantage of the differences in the costs and returns between markets.

Why do we need financial innovation?

1. Increased volatility of markets, interest rates, inflation, etc
2. Changing global patterns of financial wealth
3. Incentives to get around existing regulations and tax laws
4. Competition among financial intermediaries
5. Technological advancements

ASSET SECURITIZATION

Asset-backed securities are securities which are backed by pools of



underlying assets. These assets are usually **illiquid** and **private** in nature. A securitization occurs to make these assets available for

investment to a much broader range of investors. The "pooling" of assets makes the securitization large enough to be **economical** and to **diversify** the qualities of the underlying assets. A special purpose vehicle is set up which takes title to the assets and the cash flows are passed through to the investors in the form of an **asset-backed security**.

The **originator** of the underlying assets (typically a bank or other type of financial institution) sells them to a special purpose vehicle (SPV). The SPV issues bonds or notes to investors to pay for the assets it has bought from the originator. Investors receive interest and return of principal on their tranches of bonds from the interest and principal flows in the asset pool. The following diagram will give you an idea of it:

Benefits to Issuers

1. **Reduced cost of funding –** Through securitization, a company rated BB but with AAA-worthy cash flow may be able to borrow at AAA rates. This is the primary reason to securitize a cash flow, and it can have tremendous impacts on borrowing costs.
2. **Transfer risks -** Securitization makes it possible to transfer risks from an entity that does not want to bear them to one that does. Also helps in management of interest rate volatility and diversification.
3. **Generation of servicing fee income** – Asset securitization allows the issuer to convert capital intensive assets to less capital intensive source of servicing fee income, thereby increasing servicing and origination fees without increasing its capital base.

4. **Reduces asset-liability mismatch**: Depending on the structure chosen, securitization can offer perfect matched funding by eliminating funding exposure in terms of both duration and pricing basis. Essentially, in most banks and finance companies, the liability book or the funding comes from borrowings. This often comes at a high cost. Securitization allows such banks and finance companies to create a self-funded asset book.

Benefits to Investors

1. It increases the opportunities for investment.
2. There is opportunity to potentially earn a higher rate of return (on a risk-adjusted basis)
3. There is opportunity to invest in a specific pool of high-quality assets.
4. Credit risk is reduced because of diversification and credit enhancement.

Benefits to Borrowers

Asset Securitization benefits the borrowers by raising the available capital and reducing the costs.

CHAPTER – 2.3

DERIVATIVES – FORWARDS, FUTURES, OPTIONS, SWAPS

DERIVATIVES

Derivative is a product whose value is derived from the value of one or more basic variables, called underlying. The underlying asset can be equity, index, foreign exchange (forex), commodity or any other asset. Derivative products initially emerged as

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hedging devices against fluctuations in commodity prices. Since their emergence, these products have become very popular.

I. FORWARDS

A forward contract is the simplest derivative instrument. It is a private agreement between two parties in which one party (the buyer) agrees to buy from other party (the seller) an underlying asset, on a future date at a price established at the start of the contract. Therefore it is a commitment by two parties to engage in a transaction at a later date with price set in advance. The buyer is called the long and the seller is called the short.

II. FUTURES

Like a forward contract, a futures contract is an agreement between two parties in which the buyer agrees to buy an underlying asset from the seller at a future date at a price that is agreed upon today.

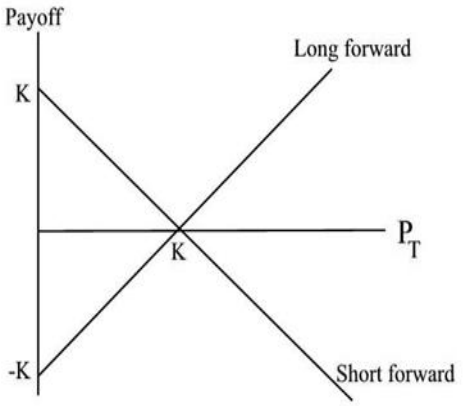
FORWARDS	FUTURES
It is a private transaction.	It gets traded on exchange.
There is no Clearing House Corporation in forwards contract. There is market and credit risk.	Both the buyer and the seller of the futures contracts are protected against the counter party risk by an entity called the Clearing Corporation.
Mark-to-market and margining are not required.	Mark-to-market and margining are required.
There are no cash flows until delivery.	There are cash flows in the form of margin requirements, etc.

Payoff diagrams:

K – Strike Price

P_T – Spot Price

If Spot Price is less than the Strike Price, then the one who is **long** on the contract loses and the one who is taking the **short** position gains.



Clearing House

Every exchange has an associated clearing house. The function of the clearing house is to ensure the financial integrity of each futures contract and of the futures exchange.

The clearing house inserts itself between the contracting parties, essentially becoming long to each short and short to each long. It is for this reason that a futures trader does not need to know who his counterparty is, since it will become the clearing house. The clearing house ensures the financial integrity of the contracts and the futures exchange by requiring each trader to tender **margin**.

Initial Margin: Deposited when positions are entered. Exchanges set minimum margin requirements. Margins are based on market conditions and are adjusted from time to time.

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Daily Variation Margin: Futures positions are marked-to-market and gains and losses are calculated daily. Gains are received and losses are paid.

III. OPTIONS

Like forwards and futures, options are derivative instruments that provide the opportunity to buy or sell an underlying asset on a future date. An option is a derivative contract between a buyer and a seller, where one party gives to the other the right, but not the obligation, to buy from (or sell to) the First Party the underlying asset on or before a specific day at an agreed - upon price (called the strike price). In return for granting the option, the party granting the option collects a payment from the other party. This payment collected is called the "premium" or price of the option.

Important terminologies

Buyer of an option: The buyer of an option is the one who by paying the option premium buys the right but not the obligation to exercise his option on the seller/writer.

Writer / seller of an option: The writer / seller of a call/put option is the one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer exercises on him.

Call option: A call option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.

Put option: A put option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.

Option price/premium: Option price is the price which the option buyer pays to the option seller. It is also referred to as the option premium.

Expiration date: The date specified in the options contract is known as the expiration date, the exercise date, the strike date or the maturity.

Strike price: The price specified in the options contract is known as the strike price or the exercise price.

American options: American options are options that can be exercised at any time up to the expiration date.

European options: European options are options that can be exercised only on the expiration date itself.

Payoffs

	Buyer of the Option	**Writer of the Option**
Losses	Limited	Unlimited
Gains	Unlimited	Limited to the Premium

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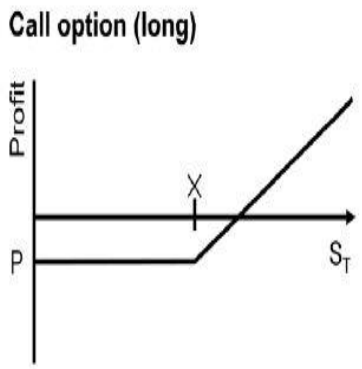
The payoff diagrams are given below:

1. **Long Call**

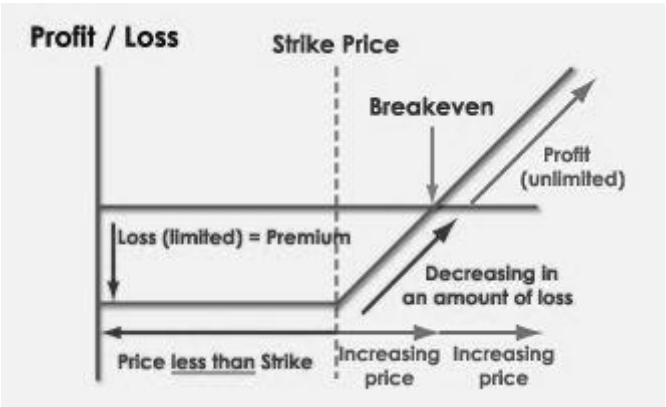
Buying a Call option – This means you have the right but not the obligation to buy an asset at a certain date for a certain price.

X – Strike Price/Exercise Price

S_T – Spot Price (The price at expiration)



CASE 1: Spot Price < Strike Price: It's better to buy the asset at a lower price (spot price) than to buy it at the Strike Price. Hence, the buyer of the Call option will not exercise the contract. His loss will be equal to **P** (Premium/Price of the option).



CASE 2: Spot Price > Strike Price: The option will be exercised as the buyer of the option gets to buy the asset at X when the

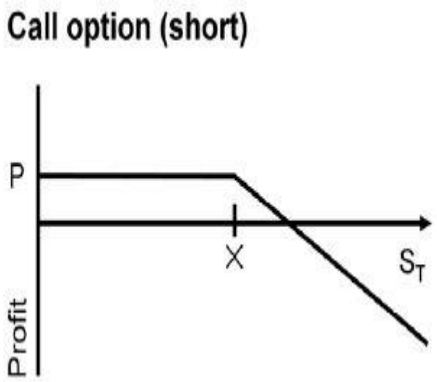
current price(spot price) is greater than X. As a result, the payoff increases.

CASE 3: Spot Price = Strike Price: Indifferent between exercising and not exercising the option. The payoff is same in both the cases (loss of Premium)

Note: The breakeven point is X+P (The point where the payoff profile cuts the X-axis). When $S_T < P$, you make loss of premium, when $S_T > P$, initially you still make loss (but less than the premium) but, finally, the profits become positive and can go unlimited. The diagram will help you understand better.

2. Short Call

Seller of a Call option – This means you sell an option to a buyer who has the right but not the obligation to buy an asset at a certain date for a certain price. In return, you get a Premium (P).



The payoff profile is just the mirror image of that of "Long Call" along X-axis. This is because loss of buyer of call option is the gain of the seller of call option and vice-versa.

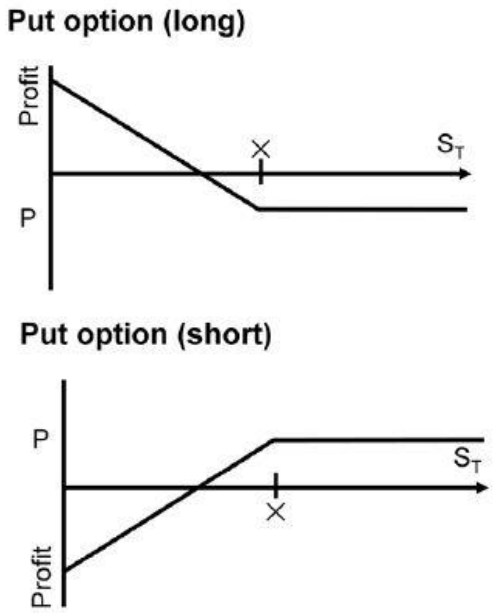
3. Long Put

Buying a Put option – This means you have the right but not the obligation to sell an asset at a certain date for a certain price.

4. Short Put

Seller of a Put option – This means that you sell an option to a person (buyer) giving him the right but not the obligation to sell an asset at a certain date for a certain price. In return you get a Premium.

The payoff profiles are:



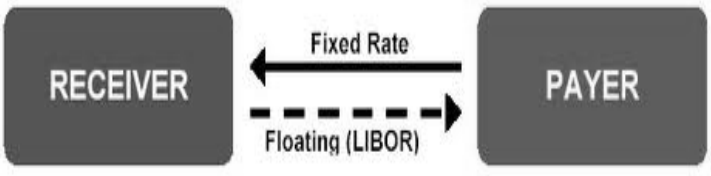
IV. INTEREST RATE SWAPS

An **interest rate swap** (IRS) is a popular and highly liquid financial derivative instrument in which two parties agree to exchange interest rate cash flows, based on a specified notional amount from a fixed rate to a floating rate (or vice versa) or from one

floating rate to another. Interest rate swaps are commonly used for both hedging and speculating. This notional amount is generally not exchanged between counterparties, but is used only for calculating the size of cash flows to be exchanged.

The most common interest rate swap is one where one counterparty A pays a fixed rate (the swap rate) to counterparty B, while receiving a floating rate (usually pegged to a reference rate such as London Inter-Bank Offer Rate or LIBOR). Thus, A pays fixed rate to B (A receives variable rate) and B pays variable rate to A (B receives fixed rate). Depending on what the variable rate is, whether it's greater or smaller than the fixed rate, gains/losses are determined.

Example: Consider the following swap in which Party A agrees to pay Party B periodic fixed interest rate payments of 8%, in exchange for periodic variable interest rate payments of LIBOR. Note that there is no exchange of the principal amounts and that



the interest rates are on a 'notional' (i.e. imaginary) principal amount. Also note that the interest payments are settled in net; for example, Party A pays (8% - LIBOR). The fixed rate (8% in this example) is referred to as the swap rate. If the variable rate (LIBOR) is greater than fixed swap rate (8%), then Party A gains and Party B loses.

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There are two ways in which a swap option can be interpreted:

1. As a package of forwards, futures contract
2. As a package of cash flows from buying and selling cash market instruments.

	Counterparties to		Interest Rates	
	FRA	**Futures/Forwards on fixed Income Statement**	**DECREASE**	**INCREASE**
Floating rate payer	Seller	Buyer	Gains	Losses
Fixed rate payer	Buyer	Seller	Losses	Gains

FRA (Forward Rate Agreement) is an interest rate futures contract in which the underlying is a rate. The buyer of an FRA gains if the reference rate rises above the contract rate at the settlement date and loses otherwise. The opposite is true for the seller of FRA. The table above compares the position of swap parties and the parties to an FRA if rates increase and decrease. FRA is a special case of swap where there is only one settlement date.

The long futures (buyer) position gains if interest rate declines and loses if it rises. This is similar to risk/return profile of a floating rate payer. Similarly, the risk/return profile of a fixed rate payer is similar to the short futures position.

CHAPTER – 2.4

WHY DO FINANCIAL INSTITUTIONS EXIST?

The various financial institutions that exist around the world include: banks, insurance companies, mutual funds, stock and bond markets etc. which channelizes money from savers to people with productive investment opportunities. There are **eight basic facts about the financial system**:

1. Stocks are not the most important source of external financing for businesses.
2. Issuing marketable debt and equity securities is not the primary way for businesses to finance their operations.
3. Indirect finance (through financial intermediaries) is much more important to raise funds than direct financing.
4. Financial intermediaries, particularly banks, are the most important source of external funds used to finance businesses.
5. Financial sector is heavily regulated.
6. Only large established corporations have access to the securities market to raise funds for their projects.
7. Collateral is prevalent feature of debt contracts for both households and businesses.
8. Debt contracts are typically extremely complicated legal documents that put restrictions on the behavior of the borrower.

The above 8 facts can be understood by studying the impact of information and transaction costs on the structure of financial markets.

TRANSACTIONS COST

The problems that an investor faces when he directly tries to participate in the financial market are manifold:

- ☑ Small amount of funds- so buy small number of shares
- ☑ Brokerage is a large proportion of total investments for small investments
- ☑ Since not much funds thus cant diversify
- ☑ Sometimes not enough funds to buy shares/ bonds with large minimum denomination, larger than what you have

Financial intermediaries help reduce these costs and help small investors and borrowers to benefit out of the financial markets

- **Economies of Scale**: This is an important factor that helps reduce transactions cost because it bundles together the funds of the many small investors and thus take advantage of economies of scale (reducing the cost of per unit investment as transactions increases). This is because the cost of carrying out investments in financial markets increases only little as transaction size increases. Thus the cost as a proportion of investments is lower for intermediaries.

  It helps small investors take benefit of diversification. They invest through mutual funds which buy large blocks of shares/bonds which reduce transaction costs as well as allow them to diversify.

  It also helps lowering cost of things like computer technology the cost of which can now be divided among larger heads.

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- **Expertise**: Intermediaries are better able to develop expertise to lower transactions costs such as expertise in computer technology so that they can provide toll free numbers to investors to help them stay updated.
  They also provide investors liquidity services which makes transactions easier e.g. they are allowed to write checks from their mutual fund accounts.

INFORMATION COSTS

Asymmetric information- one party has more information than other party involved in a transaction. How this affects economic behavior is called **agency theory**.

Adverse selection- It is an asymmetric information problem that occurs before the transaction occurs. The parties who are most likely to default are the ones who would actively participate in a transaction.

Moral Hazard- It is an asymmetric information problem that occurs after the transaction has taken place. The lender runs a risk that the borrower will engage in undesirable activities which will make the repayment of loan less likely.

Adverse selection in stock and bond markets (Lemons)

The investors in the market generally can't distinguish between good and bad risks (corporates). Thus they are willing to pay an average price (on securities) or receive average interest rate (from bonds) from all firms alike. A good firm knows at this average price its security is undervalued or the interest

demanded is high thus it wouldn't sell its securities or bonds in the market. The only firms willing to sell would be those who are not sure about repayment (bad risks). The investor realizes this and he doesn't want to hold securities or bonds of a bad firm thus he would opt out of the market without making any investments.

This shows why securities and bonds market are not the primary way of financing.

Solutions to adverse selection problem:

The solution requires investors to have more information so that they can differentiate good and bad risks and value securities and bonds at the right price.

1. **Private production and sale of information**: Private companies can collect and produce information that helps differentiate good and bad risks and then sell it.

   However this doesn't solve the problem completely due to **free rider problem**. Suppose if someone buys information and decides to invest in some stock, someone else who knows that this person has information can merely copy him i.e. take benefit of the information without paying for it. If others also do so, it would drive the prices up and the person who bought information would no longer be able to take benefit of lower prices that would have prevailed in the absence of free rider problem. Thus he would not buy information in the future; demand for information would go down so companies' incentive to produce information would go down, information asymmetry persists.

2. **Government Regulation to increase information**: Since private market fails as seen above, government can produce information to help investors or it can regulate firms and encourage them to reveal information.
   Government production of information would involve negative information about some firms which politically may not be feasible.

   Thus regulation is a better method however even this is not foolproof- e.g. scams.
   This shows that financial markets are one the most regulated markets.

3. **Financial Intermediation**: A financial intermediary like a bank becomes expert in producing information to sort good and bad risks. Then it benefits by lending to them accordingly. It also avoids free rider problem because the assets that they buy are not tradable i.e. they give private loans. The other investors don't know what the bank is doing and thus can't follow and bid up the prices.
   This shows why financial intermediation and banks in particular are most important for generating funds.

   The better known a firm is, more information is available about it in the market. Thus it is easier for investors to evaluate the quality of the corporation. Here the problem of asymmetric information is reduced greatly thus investors would be willing to invest directly in such firms. Thus large

corporations can raise funds through securities- **Pecking order hypothesis**

4. **Collateral and net worth:** Collateral is the security against the loan that someone takes. In case of default the lender can sell the collateral to get back a part/ full amount back thus he doesn't care much whether the borrower is good/ bad risk.

   Net worth (Assets – liabilities) play a similar role as collateral because if a company with high net worth borrows and then investment fails the investor can take title to the net worth to get his money back. Also higher the net worth, the firm is less likely to default on its loan as it has a cushion of assets.

Moral hazard- Choice between Debt and Equity contracts

Equity contracts entitle the investor a share in the profits and assets of a business and are subject to **principal agent problem.** There is a separation in ownership and control i.e. owners (principals) are different from controllers (agents) and thus leads to moral hazard as agents have an incentive to work in their own interests rather than maximizing profits which is in the interest of the owners.

Managers of firms can be dishonest about how much profits they earn, they might not be careful with investments as it is not their own money that is at stake, they might build luxurious offices (personal benefits), or they might act in a way that increases their power but not profits like acquiring new firms.

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Solutions to Moral hazard problem:

This problem again like adverse selection arises because borrower has more information about his actions than investor, and it can be solved if somehow the borrower's actions could be monitored.

1. **Private monitoring**: Monitoring the actions of the borrowers, regular auditing and checking what the management is doing are ways to solve moral hazard problems but are expensive (costly state verification). Also this again suffers with the **free rider problem** that was explained above. People pay to companies to monitor firms of which you have shares; others can just follow you without paying and save the money.

2. **Government regulation:** Government regulates firms, has laws that forces firms to adhere to standard accounting principles and also imposes strict penalties on people who commit frauds. However this again is not easy to do.
   This shows that why financial markets are heavily regulated.

3. **Financial intermediation:** They can avoid the free rider problem. Another intermediary that helps reduce moral hazard problems are **Venture Capital firms**- they pool in the resources of their partners and use the funds to help building entrepreneurs start new businesses. For this they receive equity shares and also insist their own people to be part of managing committee to be able to track profits and performance. The equity of these start-ups is not marketable thus free rider problem doesn't arise.

4. **Debt contract:** Equity is a claim on profits of the company whereas debt contracts entitle the investor a fixed amount irrespective of the profits the firm earns. Thus moral hazard is not a problem unless it interrupts with the firm's ability to pay. It requires less frequent need to monitor and thus shows that why debt contracts are more prevalent than equity.

Moral Hazard in Debt Markets

Debt contracts do not completely eliminate moral hazard because the borrowers have an incentive to undertake riskier investment projects- which affects their ability to repay. If the project fails, the investor is the one at loss because borrower can't repay anything.

Solutions to moral hazard problem in debt contracts:

1. **Net Worth:** When borrowers have more at stake because their net worth is high, the risk of moral hazard greatly reduces because now the borrower himself has a lot to lose. His own money is invested which he would not like to lose. Thus net worth makes debt contracts **incentive-compatible** (aligns the incentive of lenders and borrowers).

2. **Monitoring and Enforcement of Restrictive covenants:** This means that investor writes provisions/ restrictive covenants into debt contracts that restricts the borrower's activities. Then the investor monitors whether he is complying with the covenants and enforce the covenants if he is not.
   These can be of 4 types:
   (a) Covenants to restrict undesirable behavior

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(b) Covenants to encourage desirable behavior

(c) Covenants to keep collateral valuable (which can be used at the time of default to recoup money)

(d) Covenants to provide information

This shows why debt contracts are complicated legal documents.

3. **Financial Intermediation:** Covenants have two problems; one that they have to be monitored and enforced which is costly and also gives rise to free rider problem and two that the borrowers can find loopholes in them.

   Financial intermediaries are efficient in monitoring and enforcing restrictive covenants and also do away with the moral hazard problem as they make private loans which are non-tradable.

Financial Crisis and Aggregate economic activity

A crisis occurs when there is disruption in the financial system which increases the problem of adverse selection and moral hazard to such an extent that the markets are unable to channel funds efficiently, this then contracts economic activity sharply.

CAUSES-

1. **Increase in interest rates:** As seen earlier we know that only bad risks/ borrowers are willing to pay a high interest rate. If market interest rate goes up sufficiently (decline in money supply or increase in money demand), it would drive out the good borrowers from the market leaving an adverse pool of borrowers to which lenders would not want to lend.

2. **Increase in uncertainty:** A stock market crash, failure of a prominent financial institution, recession etc. lead to an increase in uncertainty which makes it difficult for the lenders to screen good from bad risks. This makes them less willing to lend which depresses economic activity.

3. **Asset market effects on balance sheet:** At the of time of stock market crash, net worth of firms decreases as share prices decrease this means lenders are less willing to lend (both adverse selection and moral hazard problems increase) and thus leads to contraction. Similarly an unanticipated decline in aggregate price level also reduces net wealth of corporations leading to contraction in lending and thus economic activity. Other reasons having similar impacts include uncertainty about future value of domestic currency, an increase in interest rates- all of these affect the balance sheet of the banks or households which reduces the amount that they have / are willing to lend.

4. **Problems in banking sector:** Deterioration in the balance sheet of bank leads to reduction in lending which depresses economic activity. If this deterioration is substantial it can also lead to a bank run/ panic. Banks begin to reduce loans thus driving up interest rates, increasing adverse selection and moral hazard problems.

5. **Government fiscal imbalances:** In developing economies where government fiscal deficits are high, people don't buy government bonds and thus government forces banks to buy them. If the debt then declines in price following government

default it would hamper the bank's balance sheet and lead to contraction in lending.

CHAPTER – 2.5

TYPES OF FINANCIAL INTERMEDIARIES AND FINANCIAL MARKETS

A brief account of major **financial intermediaries**:

1. **Commercial Banks** – A commercial bank is a type of bank that provides services, such as accepting deposits, giving business loans and basic investment products. Commercial bank can also refer to a bank or a division of a bank that mostly deals with deposits and loans from corporations or large businesses, as opposed to individual members of the public (retail banking).

2. **Non-Banking Financial Companies –** They provide variety of asset based and advisory services. Most of these funds are raised in the form of public deposits, ranging between one year to seven years of maturity. Depending upon nature and type of service, they are categorized into venture capital funds, credit rating agencies, merchant banking organizations, housing finance companies, depositories, etc.

3. **Mutual funds** – It is a professionally managed collective investment vehicle that pools money from many investors to purchase securities. A mutual fund is set up in the form of a trust which has a sponsor, trustees, Asset Management Company (AMC) and custodian.

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Mutual funds have **advantages** compared to direct investing in individual securities. These include:

- Increased diversification
- Daily liquidity
- Professional investment management
- Ability to participate in investments that may be available only to larger investors
- Service and convenience
- Government oversight
- Ease of comparison

Mutual funds have **disadvantages** as well, which include:

- Fees
- Less control over timing of recognition of gains
- Less predictable income
- No opportunity to customize

4. **Insurance Organizations** – They are basically the companies that essentially invest the savings of their policy holders and in exchange promise them a specified sum at a later stage. They are guided by the consideration of protecting the interest of policyholders whose money they hold in trust.

FINANCIAL MARKETS

1. **Money Market** – A market for dealing in monetary/financial assets of a short term nature, generally less than one year. Broad objectives:
    - Equilibrating mechanism for evening out short term surpluses and deficiencies in the financial system

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- Focal point of Central bank's intervention for influencing liquidity in the economy
- A reasonable access to the users of short term funds to meet their requirements at realistic prices.

2. **Capital/securities market** – A market for long term funds. It has two segments – primary market and secondary stock exchange market. It performs **triple service** function – origination, underwriting and distribution of securities to the investors.

Government Securities Market (GSM)

General Features

Government securities are issued by the Central, state, and semi government authorities (includes state electricity boards, municipalities, IDBI, NABARD etc. These provide resources to the government for meeting short and long term needs. These securities include bonds, treasury bills, special rupee securities etc.

Some factors that make government securities **unique and important financial instruments** are:

- Unlike other instruments these are also held by the Central bank and working of monetary control –open market operations and SLR are closely connected to these.
- Fiscal policy of the government is dependent on these (source of borrowing). Banks have to maintain their

secondary reserve requirement in the form of these securities.

- They can be used as collateral to obtain loans. These are highly secure assets because of government backing (gilt-edged). There is no default/ credit risk.
- Currency can also be issued against the backing of these securities and thus they become a part of the ultimate source of liquidity.
- Since it is default risk free it acts as the benchmark for pricing corporate securities of varying maturity.

Denomination

They are mostly available in the denominations of 100 of 1000. The interest rate is low because it is default risk free and liquid. The market for government securities has been expanding because of regulation under which banks and institutions have to invest in these securities.

Interest payments and Liquidity

The interest is paid half yearly. The income from central and state government securities is exempted from taxes (up to a certain limit) whereas of local authorities is not.

The Central bank's securities are the most liquid of all (they are considered to be the safest of all), the marketability of state governments and semi governments is restricted (require underwriting from the central bank where central bank guarantees repayment) thus they are less liquid.

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Forms of governments securities

(a) Inscribed stock/ stock certificate **SC** (not popular with investors)

(b) Promissory notes **PN** (most common), (they can be converted into stock certificates)

(c) Bearer bond (not usually issued in India)

Government promotes SC's over PN's by highlighting the following differences:

- They are safer as the name of the bearer is registered with public debt office
- The SC relating to an application is directly sent to the bearer
- The half yearly interest is remitted to the bearer directly by an interest warrant or is sent by money order (whereas in PN is payable only on presenting the note at the office)
- The holder can sell it by signing the transfer form on the reverse of the certificate

The major reason why still SC is not preferred is its lack of transferability and negotiability whereas in PN the title is transferable by endorsement and delivery and it is a negotiable instrument.

Mode of issue

The securities are issued through the Public debt office of RBI. The issues are notified a few days before they become open for subscription and they are then kept open for subscription for 2/3 days or may close early. A primary issue is notified to the people through press or government notification. These issues are mostly bought by institutional investors thus there can be small number of large issues.

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Because of the size of the debt and continuous need for raising fresh capital the effective issue and redemption on single dates is impossible. A part of the issue is taken over by RBI which sells it gradually in the stock exchanges. This makes the process of issue and redemption continuous and as these securities are available on tap these are called tap securities.

Role of brokers and dealers

GSM is an over-the-counter (telephonic) market with one to one correspondence between the buyer and the seller, where everybody deals as the principal with limited role of dealers and brokers in marketing. The RBI has its approved brokers and the participation by other brokers is limited. The role of official brokers also reduced when RBI discontinued the policy of charging differential interest rates for sale and purchase of central government securities to enable banks to approach it directly.

For the dealers, the agency of dealer banks has been more active than individual dealers. They are mainly based in Mumbai and are in direct contact with RBI, LIC and other institutional investors. They mainly act as jobbers. Since this is an OTC each deal has to be separately negotiated.

Individual dealer activity is limited because

- There are limited floating bonds available because these are generally held till maturity. Banks can buy as much as they want but can't sell below SLR requirements thus restricting secondary market.

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- RBI is the biggest dealer through its open market operations which reduces the role of dealers.
- In other countries funds needed by dealers is easily available but in India cost of borrowing is high.

Purpose of securities issue

The central and the state governments need to raise funds through public borrowings in any given year. Earlier only consolidated loans were issued but it had two problems:

- Decision on share of each state
- Centralized method didn't offer scope for tapping local resources

The issue of securities may be undertaken for:

(a) Refunding i.e. conversion or refinancing of maturing debts. This includes selling new securities for cash settlements and using proceeds to retire old issues or giving holders new securities in place of old ones at a certain conversion rate.

(b) Advance refunding i.e. refunding securities that haven't matured yet or reissue of loans.

The objective of the two is to lengthen the period of maturity structure of government debt and to reduce the cash repayments.

(c) Cash financing

RBI undertakes two operations:

- GROOMING of the market- acquiring securities nearing maturity to facilitate redemption and making available on tap a variety of loans.

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- SWITCHES in the market- purchases of one security against the sale of other security.

These are different from refunding and reissue because these take place in the secondary market whereas refunding and reissue are undertaken in the primary market.

Role of RBI

RBI operates in GSM buying them mainly in switch operations rarely for cash. These operations help banks and financial institutions improve their yields on their investments in g-secs. These switch operations are at time triangular, one party sells other buys RBI being the middle party. RBI fixes annual quota for banks for this switch operations

Unique feature of operation in GSM is the **voucher trading/ benefit.** Banks and institutions with taxable earnings purchase g-secs around interest due date and sell these after availing tax concessions/ voucher for the full year. Thus RBI has now restricted trading one month before interest due date.

REPOS market in government securities

Prior to 1992 repos market was an active market where almost all interest bearing securities were eligible for trading. But in 1992 banks misused the market to raise funds through this market which they did not possess and so transactions in repos was completely banned but gradually, T-bills, zero coupon bonds were allowed to be traded. Now it has been allowed for all dated securities and T-bills of all maturities to activate this market.

REPO (RP) agreement- A transaction in which one party sell security to the other party, simultaneously agreeing to

repurchase it in future at a specified date and time. Similarly reverse repos (RRP) concerns with buying. Thus same transaction is RP for one and RRP for the other party.

These are collateralized loans and reduce counterparty risk. They offer safe, short term outlet for temporary excess cash at close to market interest rate. The seller of the repo has to pay interest for using cash- repo rate.

Participants include securities dealer, commercial banks, DFHI, RBI (major participant) and co-operative banks, non-banking financial inst. are not allowed to participate.

Advantages:

- They are low risk, flexible, short term instruments so adaptable to wide range of uses and customer needs
- These are fund management/ SLR management used by banks.
- They offer low cost investment opportunities with yield, liquidity, collateral flexibility.
- RBI controls liquidity in the economy by operating in this market.

A scheme was announced by RBI in 1992 to improve short term management of liquidity and to even out interest rates in call/ money market.
This market has two segments:

(i) LAF (liquidity adjustment facility)
(ii) MRS (market segment)

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Efforts are being made to develop, diversify, expand, and widen repo market to enable smooth adjustment of liquidity. RBI has introduced Delivery vs. Payments system, Negotiated Dealing System, Clearing Corporation of India ltd. etc. for this.

Importance of Government Securities Market

1. From government's point of view, development of deep and liquid GSM insures public borrowings at reasonable cost and now there isn't any need for automatic monetization of government debt.
2. It helps create a benchmark for pricing and risk evaluation of other assets
3. It facilitates the development of indirect instruments of monetary policy.

Auction methods of issuing governments securities is one of the most favored forms. Market related interest rates have helped government borrow more from the market and reduce pressures from the RBI.

CHAPTER – 2.6

BANKS WITH IMPERFECT INFORMATION

There are two important concepts to be understood:

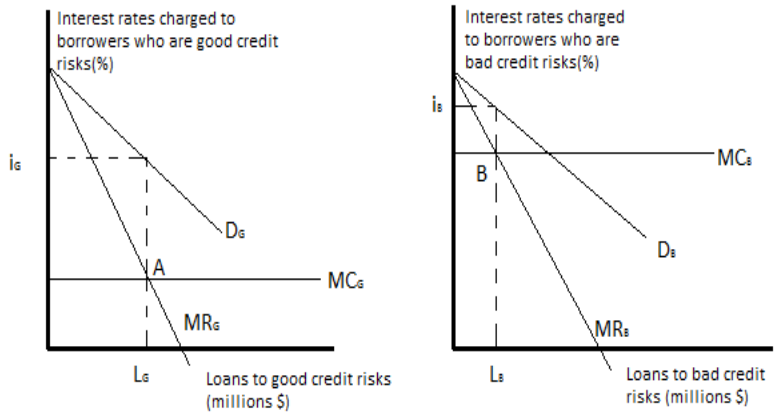
- **Symmetric imperfect information**- There is imperfect information because of the existence of uncertainty regarding repayment of loans, but this uncertainty is known to both the lender and the borrower therefore symmetric.
- **Asymmetric imperfect information**- The borrowers have better information than lenders about their ability or

willingness to pay thus asymmetric and imperfect because of the existence of uncertainty about repayment.

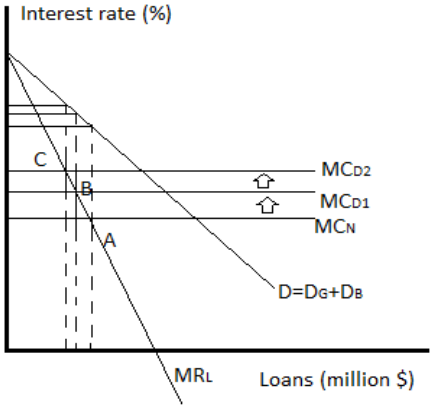
In the presence of symmetric information, the bank can charge different borrowers according to their probability of repayment. Suppose there exists two types of borrowers, high income group for whom the probability of repayment is 99% and low income group for whom it is 90%. This probability is known to both the bank and the borrower. The expected return to the bank when it lends to a high income borrower at a given interest rate is higher than that in case of a low income borrower. To be indifferent between lending to a high income and a low income borrower, the bank must be compensated for the higher default risk associated with the loan given to low income borrower. Thus the bank discriminates between creditworthy and non-creditworthy borrowers by making them pay higher interest rate- in case of symmetric information; the better credit risks do not subsidize poor credit risks.

One component of the marginal cost of issuing loan is the probability of default i.e. higher the default, higher the marginal cost because defaults increases the cost to the bank. Thus $\mathbf{MC_G}$ (marginal cost of issuing loan to good credit) **<** $\mathbf{MC_B}$ (to bad credit). Marginal revenue is identical in both cases i.e. if they repay the bank doesn't care whether it was a good or a bad credit. Here we consider a bank with market power; it has the ability to determine the interest rate that he wants to charge and faces a downward sloping demand curve. Equilibrium situation is one where **MC=MR** and this level of loan the interest rate is determined from the demand curve (AC). $\mathbf{MC_G}$**=MR** gives $\mathbf{i_G}$

(interest rate charged from good credit risks) and $\mathbf{MC_B=MR}$ gives $\mathbf{i_B}$ correspondingly. From the diagram it can be seen that $\mathbf{i_G < i_B}$ which means that borrowers who are good credit risks obtain funds at lower interest rates than bad credit risks.



Asymmetric Information and Adverse Selection



Suppose there are two types of borrowers, honest and dishonest who differ only in character, identical otherwise. Honest

borrowers repay 90% of the time whereas dishonest repay only 10% of the times. Asymmetric information exists because the bank cannot differentiate between a dishonest and an honest borrower. Since bank cannot differentiate it will charge only one interest rate to both which is an average of the interest rate he would have charged to each type in the presence of symmetric information.

The bank now charges $\mathbf{i = (i_G + i_B)/2}$ and $\mathbf{i_G < i < i_B}$ i.e. **i** lies in between the earlier interest rates (average always lies between the extremes). This means that the honest borrowers will be charged higher interest rate than what they would have been in symmetric information case and dishonest would be charged lower. Honest borrowers subsidize the dishonest borrowers and by paying higher interest rate compensate for the default risk of the dishonest borrowers.

As the interest rate rises above the rate honest/ good borrowers would have to pay in case of symmetric information, they are discouraged to borrow and thus quantity demanded of loan by good borrowers fall. As a result, now proportionately, there are more dishonest/ bad borrowers in the pool, defaults increases as a proportion of total loans. When defaults increase, the MC for the banks increase and thus the interest rate increases further to offset the higher cost. Now with a higher interest rate, even more honest borrowers are discouraged and move out of the market. This can be seen in the given diagram.

In the diagram it can be seen that as more honest borrowers leave the market and more dishonest borrowers are left, due to

higher defaults the MC line shifts up thus leading to an increase in **i.**

Ultimately as the interest rate keeps on increasing, a situation is reached where the bank lends to only dishonest borrowers driving the good ones out of the market. At such high interest rates only those who have no intensions to repay are willing to borrow. This is known as the problem of adverse selection- as interest rate rises, honest borrowers decide not to borrow and the bank is left with an adverse pool of borrowers.

Adverse selection occurs because of two reasons:

1. Asymmetric information about honesty of borrower.
2. Borrowers have better information about the riskiness of the projects they are borrowing for and thus whether they would be able to repay or not.

In the absence of a mechanism to deal with adverse selection problem, the banks would ultimately refuse to lend at all leading to a collapse of the loan market.

Bank strategies for countering asymmetric information

Since loans are the driving engine that leads to money creation, banks have developed several effective mechanisms to deal with default risks and other information asymmetries.

1. **Credit Reports**- These are the credit histories of a borrower. A bank thus reduces the level of asymmetry of information regarding the borrower by examining his/her credit reports. Based on past behavior, the bank infers the probability of default of the borrower on a new loan. If the credit reports

are 100% accurate, it leads to symmetric information and thus the bank can charge the interest rates accordingly. But there exist the following issues with:

(a) Inaccurate or incomplete credit reports; this means that some asymmetry and thus adverse selection will exist.

(b) First time borrowers; they won't have a credit history because they have never borrowed before and thus in such cases asymmetric information persists.

2. **Reputation**- Some banks build a reputation for being tough on the borrowers who default to discourage them and other borrowers from defaulting. This might include foreclosing on assets purchased using loan amount or take legal actions etc. There exists a problem with this method; there isn't any way for the banks to differentiate a dishonest defaulter from someone who genuinely couldn't repay. If the bank adopts a policy of being lenient on the defaulters this would attract dishonest borrowers leading to adverse selection problem.

   By investing in a reputation for being tough on defaulters, banks can reduce the negative impact of asymmetric information- fewer defaults mean lower interest rate (good borrowers have incentive to borrow) and those who borrow also benefit. Banks are tough on defaulters because if they fail to do so, then due to the problem of adverse selection there won't be money available for honest borrowers.

3. **Collateral**- Collateral is a property that the borrower has to keep with the lender as a security against the loan obtained.

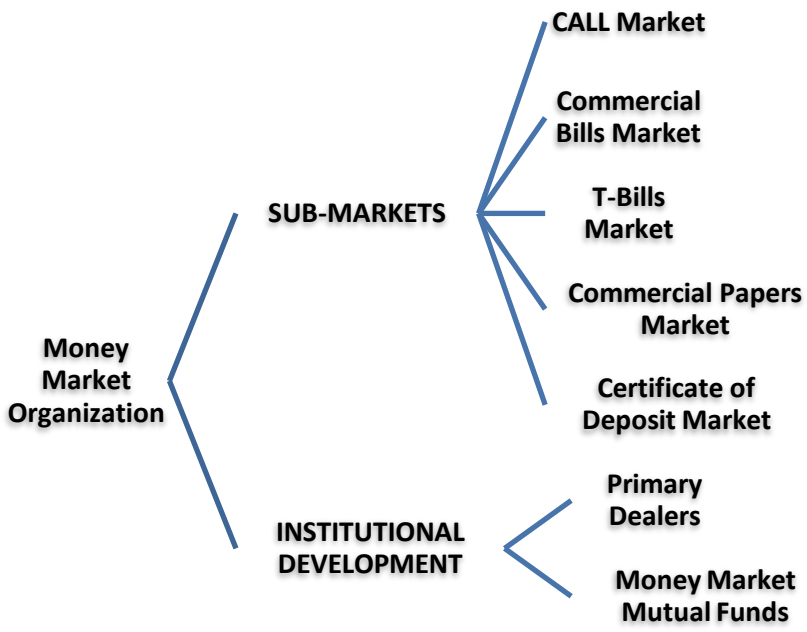
If there is a default, the lender becomes the owner of the property/ asset and then can sell it to get back a part of/ entire loan amount back. To incentivize borrowers to repay the loan, the value of the collateral should be high e.g. if a bank gives loan to a borrower to buy a house and keeps the house itself as collateral, in such a case no collateral actually exists because even if the borrower doesn't pay bank gets to keep the house but the borrower would have made us of the house. Effectively in such situations the borrower is in a win- win position. To avoid this problem banks ask the borrowers for down payment.

4. **Down Payment**- The bank agrees to pay only a part of the total price of a house/asset/ any other property, the other part has to be paid by the borrower which is called down payment. By inducing the borrower to pay, the bank ensures that he also has something on stake and thus has incentive to repay otherwise he would lose the amount he took out of his own savings. However, the amount that borrowers pay as down payment has to be decided upon carefully- it should be sizeable enough to keep loan value below the market value of the house throughout the life of the loan. Let us see why. Suppose a mortgage loan for a house worth 1 crore is taken, 90% loan amount and 10% down payment. If the price of the house remains 1 crore then the borrower has an incentive to repay because if he doesn't then he loses 10 lakhs. However, if the price of the house falls to say 75 lakhs then what the borrower has to repay is 90 lakhs is greater than the value of the house. Thus the borrower has an incentive to default.

Irrespective of the problems, collateral and down payments are valued because they are inexpensive means of recovering losses from defaults on certain loans. Other methods like legal actions, foreclosures etc. often are expensive.

CHAPTER – 2.7

MONEY MARKET ORGANIZATION



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SUB-MARKETS

I. CALL Market

Introduction

The call/notice money market forms an important segment of the Indian Money Market. Under call money market, funds are transacted on an overnight basis and under notice money market; funds are transacted for a period between 2 days and 14 days.

Participants

Participants in call/notice money market currently include scheduled commercial banks (excluding RRBs), co-operative banks (other than Land Development Banks) and Primary Dealers (PDs), both as borrowers and lenders. List of Institutions Permitted to Participate in the Call/Notice Money Market both as Lenders and Borrowers:

a. Scheduled Commercial Banks (excluding Regional Rural Banks);
b. Co-operative Banks other than Land Development Banks; and
c. Primary Dealers

Call Rates

- Eligible participants are free to decide on interest rates in call/notice money market.
- Calculation of interest payable would be based on the Handbook of Market Practices brought out by the Fixed Income Money Market and Derivatives Association of India (FIMMDA).

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II. Commercial Bills Market

Introduction

A Commercial Bill is a short term negotiable and self liquidating instrument. It is a written instrument containing an unconditional order signed by the maker (seller of goods), directing the buyer to pay a certain amount of money only to a particular person or to the bearer of the instrument. The bills can be discounted in the Bill Discount Market. In the initial stages of the development of the bill discounting market, RBI provided significant support, but it gradually withdrew its support and allowed FIs to rediscount such bills.

Reasons for bill discounting not becoming popular in India

- System of cash credit
- Small size of foreign trade
- Absence of specialized discounting institutions
- Absence of specialized credit information agencies
- Lack of an active secondary market
- Reluctance on the part of issuers to move towards bill culture
- Misuse of the bill markets in the early 1990s
- Administrative problems relating to the physical scrutiny of invoices

III. T-Bills Market

Treasury bills or T-bills, which are money market instruments, are short term debt instruments issued by the Government of India and are presently issued in three tenors, namely, **91 day, 182 day and 364 day**. Treasury bills are zero coupon securities and pay no interest.

T-Bills are issued at a discount and redeemed at the face value at maturity. For example, a 91 day Treasury bill of Rs.100/- (face value) may be issued at say Rs. 98.20, that is, at a discount of say, Rs.1.80 and would be redeemed at the face value of Rs.100/-. The return to the investors is the difference between the maturity value or the face value (that is Rs.100) and the issue price (for calculation of yield on Treasury Bills please see answer to question no. 26).

Auctions: The Reserve Bank of India conducts auctions usually every Wednesday to issue T-bills. Payments for the T-bills purchased are made on the following Friday. The 91 day T-bills are auctioned on every Wednesday. The Treasury bills of 182 days and 364 days tenure are auctioned on alternate Wednesdays. T-bills of 364 days tenure are auctioned on the Wednesday preceding the reporting Friday while 182 T-bills are auctioned on the Wednesday prior to a non-reporting Fridays. There are two types of auctions – **Multiple Price Auction** and **Uniform Price Auction**.

Announcement: The Reserve Bank releases an annual calendar of T-bill issuances for a financial year in the last week of March of the previous financial year. The Reserve Bank of India announces the issue details of T-bills through a press release every week.

IV. Commercial Papers Market

Introduction

Commercial Paper (CP) is an unsecured money market instrument issued in the form of a promissory note. CP as a

privately placed instrument was introduced in India in 1990 with a view to enabling highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors.

Advantages

Simplicity, flexible maturities, lower cost, higher credit standing, no restriction on end use funds, high liquidity, high return

Who can issue Commercial Paper (CP)

Corporates, primary dealers (PDs) and satellite dealers (SDs), and the all-India financial institutions (FIs) that have been permitted to raise short-term resources under the umbrella limit fixed by Reserve Bank of India are eligible to issue CP.

Rating Requirement

All eligible participants shall obtain the credit rating for issuance of Commercial Paper from either the Credit Rating Information Services of India Ltd. (CRISIL) or the Investment Information and Credit Rating Agency of India Ltd. (ICRA) or the Credit Analysis and Research Ltd. (CARE) or the FITCH Ratings India Pvt. Ltd. or such other credit rating agency (CRA)

Maturity

CP can be issued for maturities between a minimum of 15 days and a maximum upto one year from the date of issue.

Denominations

CP can be issued in denominations of Rs.5 lakh or multiples thereof. Amount invested by single investor should not be less than Rs.5 lakh (face value).

Limits and the Amount of Issue of CP

- CP can be issued as a "stand alone" product. The aggregate amount of CP from an issuer shall be within the limit as approved by its Board of Directors.

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- An FI can issue CP within the overall umbrella limit fixed by the RBI
- The total amount of CP proposed to be issued should be raised within a period of two weeks from the date on which the issuer opens the issue for subscription.

Who can act as Issuing and Paying Agent (IPA)

Only a scheduled bank can act as an IPA for issuance of CP.

Investment in CP

CP may be issued to and held by individuals, banking companies, other corporate bodies registered or incorporated in India and unincorporated bodies, Non-Resident Indians (NRIs) and Foreign Institutional Investors (FIIs).

Mode of Issuance

CP can be issued either in the form of a promissory note (Schedule I) or in a dematerialized form through any of the depositories approved by and registered with SEBI.

Payment of CP

The initial investor in CP shall pay the discounted value of the CP by means of a crossed account payee cheque to the account of the issuer through IPA.

Stand-by Facility

In view of CP being a `stand alone' product, it would not be obligatory in any manner on the part of banks and FIs to provide stand-by facility to the issuers of CP.

Procedure for Issuance

Every issuer must appoint an IPA for issuance of CP. The issuer should disclose to the potential investors its financial position as per the standard market practice. After the exchange of deal confirmation between the investor and the issuer, issuing company shall issue physical certificates to the investor or

arrange for crediting the CP to the investor's account with a depository.

Role and Responsibilities

(a) Issuer

Issuers would now have more flexibility. Issuers would, however, have to ensure that the guidelines and procedures laid down for CP issuance are strictly adhered to.

(b) Issuing and Paying Agent (IPA)

- IPA would ensure that issuer has the minimum credit rating as stipulated by the RBI and amount mobilized through issuance of CP is within the quantum indicated by CRA for the specified rating.
- IPA has to verify all the documents submitted by the issuer.

(c) Credit Rating Agency (CRA)

The credit rating agency would have the discretion to determine the validity period of the rating depending upon its perception about the strength of the issuer. Accordingly, CRA shall at the time of rating, clearly indicate the date when the rating is due for review.

V. Certificate of Deposits Market

Introduction

Certificate of Deposit (CD) is a negotiable money market instrument and issued in dematerialized form against funds deposited at a bank or other eligible financial institution for a specified time period. Guidelines for issue of CDs are:

Eligibility

CDs can be issued by (i) scheduled commercial banks {excluding Regional Rural Banks and Local Area Banks}; and (ii) select All-India Financial Institutions (FIs) that have been permitted by RBI

to raise short-term resources within the umbrella limit fixed by RBI.

Aggregate Amount

- Banks have the freedom to issue CDs depending on their funding requirements.
- An FI can issue CD within the overall umbrella limit fixed by RBI

Minimum Size of Issue and Denominations

Rs.1 lakh and in multiples of Rs. 1 lakh thereafter.

Who can subscribe

CDs can be issued to individuals, corporations, companies (including banks and PDs), trusts, funds, associations, etc. Non-Resident Indians (NRIs) may also subscribe to CDs, but only on non-repatriable basis.

Maturity

a. Not less than 7 days and not more than one year from the date of issue.
b. The FIs can issue CDs for a period not less than 1 year and not exceeding 3 years from the date of issue.

Discount / Coupon Rate

It may be issued at a discount on face value. Banks / FIs are also allowed to issue CDs on floating rate basis provided the methodology of compiling the floating rate is objective, transparent and market-based.

Reserve Requirements

Banks have to maintain appropriate reserve requirements, i.e., cash reserve ratio (CRR) and statutory liquidity ratio (SLR), on the issue price of the CDs.

Transferability

CDs in physical form are freely transferable by endorsement and delivery. CDs in demat form can be transferred as per the

procedure applicable to other demat securities. There is no lock-in period for the CDs.

Loans / Buy-backs

Banks / FIs cannot grant loans against CDs.

Format of CDs

Banks / FIs should issue CDs only in dematerialized form. However, according to the Depositories Act, 1996, investors have the option to seek certificate in physical form.

Security Aspect

Since CDs in physical form are freely transferable by endorsement and delivery, they should be printed on good quality security paper and necessary precautions are to be taken to guard against tampering with the document. They should be signed by two or more authorized signatories.

Payment of Certificate

Since CDs are transferable, the physical certificates may be presented for payment by the last holder. The question of liability on account of any defect in the chain of endorsements may arise. It is, therefore, desirable that banks take necessary precautions and make payment only by a crossed cheque.

Issue of Duplicate Certificates

In case of loss of physical certificates, duplicate certificates can be issued after compliance with the following:

a. Notice is required to be given in at least one local newspaper

b. Lapse of a reasonable period (say 15 days) from the date of the notice in the newspaper

c. Execution of an indemnity bond by the investor to the satisfaction of the issuer of CDs.

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INSTITUTIONAL DEVELOPMENT

I. PRIMARY DEALERS

The system of Primary Dealers (PD's) was created in 1994 with the following objectives:

1. To strengthen infrastructure- make Government Securities Market (GSM) more liquid, vibrant and broad based.
2. To help reduce the pressure on RBI for operations in the market.
3. To improve secondary market- improve price discovery, liquidity, turnover etc.
4. To make it an effective conduit for OMO's (Open Market Operations)
5. To help placing G-secs in primary issues by participating in auctions
6. To provide signals to Central Bank (CB) for market interventions.

PD's are given the following rights:

- To maintain clearing balances with RBI
- To borrow bonds/funds from RBI
- To operate switches with RBI
- Permission to borrow and lend in the money market, and to obtain all money market instruments
- To participate in G-sec auctions
- To access Open Market Operations on exclusive basis
- Access to LAF (Liquidity Adjustment Facility) of RBI
- Access to current account facility and Subsidiary General Ledger (SGL) Account facility for G-sec

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To widen the scope of organized dealing and distribution arrangements in the GSM, Satellite dealers (SD's) were also introduced. The functions of SD's are same as those of PD's.

II. MONEY MARKET MUTUAL FUNDS (MMMF)

An MMMF is a conduit through which small investors can participate in the money market to earn the market-related yield. They are, however, a marginal player in the Indian money market.

CHAPTER – 2.8

FINANCIAL SECTOR REFORMS

Before 1990s – A classic example of "*financial repression*", with monetary policy subservient to the fiscal, extensive regulations such as administered interest rates, weak banking structure, lack of proper accounting and risk management systems, fixed exchange rate system and poor financial infrastructure - this can briefly describe the financial sector in India before the 1990s.

The economic reforms that took place in 1991 were amidst two major crises involving the financial sector (BOP crisis throwing India on the brink of the default and threat of insolvency in the banking system) and hence there was a *desperate* need to reform the financial sector. Starting with a dire situation, the transformation has taken place in a **gradual** fashion, with a well sequenced and coordinated policy measures which has improved the *stability* and the *resilience* of the financial sector.

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Financial sector reforms took place in a calibrated fashion after excessive consultations with the experts, committees and various market participants. Hence, there was not a *hasty* transition but a gradual one. The aim has been to achieve the best international practices. The reform measures were planned in such a way so as to reinforce each other. Attempts were made to strengthen market forces in a competitive environment. Proper incentives and operational flexibility were provided to achieve the desire goals through interplay of market forces. In short, the **objectives of financial sector reforms of 1991 were:**

- Autonomous, transparent, competitive, market oriented, world integrated financial system
- Cautious and appropriate sequencing of reform measures.
- Increase the allocative efficiency of available savings, and promoting accelerated growth of real sector.
- Introduction of norms that are mutually reinforcing.
- Introduction of complimentary reforms across monetary, external and fiscal sectors.
- Ensuring rationalization of interest rate structure occurs – flexible, market determined interest rates.
- Development of financial institutions and proper infrastructure.
- Promoting competition by creating a level-playing field and allowing free entry and exit for institutions.
- Increase rate of return on real investment
- Improve the effectiveness of directed credit programmes.
- Modernize the instruments of monetary control.

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- Development and integration of various financial markets.

Major steps that were taken and their impacts

(Please note: There were many reforms that were undertaken, but what we do here is mention important ones and more importantly, focus on the impacts)

» **BANKING REFORMS: A Quiet Revolution**: The reforms have focused on removing financial repression through reduction in statutory pre-emption while setting up prudential regulations at the same time. (The major reforms in the banking sector have been mentioned in the box below)

Two pronged approach:

1. To increase the level of competition (as economics say, it increases efficiency, regulations results in inefficiencies) with international best practices with prudential regulations (to avoid hasty transition and also to ensure it satisfies Indian *climate*)
2. Improve the institutional arrangements including the legal framework and technological system. (Innovation leads to efficiency)

Reforms	Impacts
FDI allowed, portfolio investment, product diversification (coming up with new products like IRS, Derivatives, FRAs, etc)	Enhanced the level of competition by increasing the efficiency of markets and risk management

Mergers and amalgamations of private sector banks encouraged Granting of operational autonomy to public sector banks, reduction of public ownership in public sector banks	
Increased internal control through strengthening of internal audit, establishment of board, strengthening of corporate governance	Increased financial supervision resulting in a stable financial system
Setting up of Lok Adalats, Clearing Corporation of India Limited (CCIL) , Credit Information Bureau of India Limited (CIBIL)	Resulted in quicker recovery, restructuring and information sharing on defaulters
Market determined pricing for government securities, disbanding of administered interest rates, introduction of interim LAF (Liquidity Adjustment facility) through reverse repo and repo rates, reduction in pre-emption through reserve requirement	It enhanced the role of the market forces and ensured transparency
Financial liberalization, application of marked to market principle for investment portfolio, best international practices, recognition of different components of risks (Prudential measures)	Ensured risk management and a **resilience** financial sector
Setting up of RTGS system (Real Time Gross Settlement)	Technological improvement

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» **EXTERNAL FINANCIAL MARKET REFORMS - Change in the exchange rate regime**: A gradual transition took place. A short period of official (40%) + market determined (60%) exchange rate after 1991, followed by a complete transition to fully market determined exchange rate. A movement from *regulation (FERA)* to *management (FEMA)*

Impacts:

1. In the **post reform period**, with managed flexible exchange rates, BOP crisis was avoided. The current account deficit narrowed because of increase in inflow of receipts and capital account improved because of FDI inflow.

2. The forex management has helped ensure stability but with interventions like sterilization operations of RBI. Moreover with managed flexible exchange rate and partial K controls, India enjoyed **substantial monetary independence** (related to the concept of impossible trinity)

» **MONETARY POLICY FRAMEWORK – SYSTEMIC POLICY REFORMS**: The basic emphasis of monetary policy since the initiation of reforms has been to reduce market segmentation in the financial sector through increased inter-linkages between various segments of the financial market including money, government security and forex market. The various reforms and their impacts are given below.

Reforms	Impacts
Shift from monetary targeting framework to a multiple indicator approach (Agreement between Government and RBI 1994)	Met the challenges thrown by financial liberalization and growing complexities of money management. Ensured **independent** monetary system
Use of broad money, introduction of LAF, move from direct to indirect instruments like open market instruments, MSS (Market Stabilization Scheme)	Maintaining price stability and availability of adequate credit to productive sectors to support growth
Development of government securities market (measures mentioned later), Creation of separate financial market department within RBI	Deepening of financial markets, providing strength to the foundation.

» **Functioning of the financial markets**:

MONEY MARKET REFORMS

- Development of a proper short term rupee yield curve
- Proper interest rate structure to ensure liquidity and risk management
- Introduction of financial instruments (financial innovations) like FRAs, IRS, IBPCs
- Introduction of LAF - Liquidity Adjustment Facility

- Shift from Uncollateralized to Collateralized Money market
- Increasing support of RBI and allowing PDs and SDs to operate
- Prudent limits beyond which banks should not rely on Call Money Market

Impacts

The success of a framework that relies on indirect instruments of monetary management such as interest rates, is contingent upon the extent and speed with which changes in the central bank's policy rate are transmitted to the spectrum of market interest rates and exchange rate in the economy and onward to the real sector. Money markets played a critical role in this transmission mechanism. This policy-induced shift resulted in financial stability and is yielding results.

GOVERNMENT SECURITIES MARKET REFORMS

- Administered interest rate was replaced by auctioning system (Led to better Price Discovery)
- PDs, MSS, LAF, 91 day T-Bill, Screen Based trading, RTGS systems, etc were introduced
- FIIs were allowed to invest in Government Securities Market
- Trading of government securities on stock exchange
- Transparency through DvP (Delivery versus Pay settlement system)

Impacts

Market based interest rated helped to raise substantial market loans since 1990s. It resulted in flexibility in

demand and supply of government securities. It has resulted in shifting down and flattening of yield curve resulting in a long, smooth, sovereign yield curve which can be used for benchmarking.

CAPITAL MARKET REFORMS

- Indian stock markets have moved from open outcry system to online screen based trading system
- Introduction of various instruments like American Depository Receipts(ADR), Global Depository Receipts (GDR), Foreign Currency Convertible Bonds)(FCCB), Settlement Guarantee Fund (SGF) and External Commercial Borrowings (ECBs)
- Shorter settlement cycles introduced. (T+2, T+3)
- FIIs were allowed to invest in Indian equities since 1992.

Impacts

It ensured best international practices. The Indian capital markets have widened and deepened with a larger investment base and the emergence of a wide range of innovative/hybrid instruments. This has provided the much needed stability and resilience.

Both exchange rate and interest rate are the key prices reflecting the cost of money, it is particularly important for the efficient functioning of the economy that they be market determined and be easily observed. The Reserve Bank has, therefore, put in place a liquidity management framework in the form of a **Liquidity Adjustment Facility** (LAF) for the facilitation of forex and money market transactions that result in better price

discovery. LAF helped to stabilize short term money market rates.

IMPACTS OF FINANCIAL SECTOR REFORMS

Financial Sector Reforms set in motion in 1991 have greatly changed the face of Indian Banking. The banking industry has moved gradually from a **regulated environment to a deregulated market economy**. The market developments kindled by **liberalization** and **globalization** have resulted in changes in the intermediation role of banks.

- Capital position and asset quality has improved
- Profitability of the banks have increased considerably
- The returns on equity and returns on assets (ROE, ROA) have shown significant improvement
- There has been a substantial progress in cleaning off NPAs (Non Performing Assets which are junk bonds and hence jeopardy of default)
- There has been financial deepening with the improvement of financial infrastructure
- There has been an increase in the share of non interest income of banks and diversification of bank's portfolio
- The banking sector has shown sustained improvement in regard to solvency and soundness as revealed from the capital adequacy requirement.(CRAR Capital to risk weighted assets ratio has improved)
- There has been an overall macroeconomic balance with integrated and developed financial markets
- Better credit delivery and enhanced competition and efficiency

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» Increase in the GDP growth, improvements in productivity and efficiency of banks

In a nutshell, the financial sector reforms led to resilience and stability of the Indian financial sector and it has been witnessed in the past through the ways in which the financial sector has dealt with the various crises at the international level.

QUESTIONS

1. "The more collateral there is backing a loan, the less the lender has to worry about adverse selection." Do you agree with this statement? Explain.
2. How does the free rider problem aggravate adverse selection and moral hazard problem in financial markets?
3. Would moral hazard and adverse selection still arise in financial markets if information were asymmetric? Explain.
4. Write a short note on Asset Securitization. In what way can asset securitization reduce the cost of funds for an issuer?
5. Explain the organization of the money market in terms of the main instruments/markets and the intermediaries.
6. What was the rationale behind the financial reforms introduced in 1991? Highlight some of the major reforms.
7. How are forwards different from options? What is the extent of gain/loss for the following:
   (a) Seller of a Put Option

(b) Buyer of a Call Option
(c) Taking a Long position on the futures contract
(d) Taking a fixed leg in an interest rate swap

8. Explain the role of clearing house and margin requirements in futures contract.
9. Banks that can issue car loans require a much larger down payment on a used car than on a new car. Furthermore, interest rates on used car loans are higher than rates on new cars. Why?
10. Explain how a financial intermediary reduces the cost of contracting and information processing.
11. "Derivative markets are nothing more than legalized gambling casinos and serve no economic function." Comment on this statement.
12. How can the existence of asymmetric information provide rationale for government regulation of financial markets?
13. Explain the following terms:
    (a) Government Securities
    (b) Primary Dealers
    (c) Institutionalization of capital markets
    (d) Short Put
14. What is an Interest Rate Swap? When will you want to be a floating rate payer? A fixed rate payer? Interpret a swap position as a package of forwards/futures contracts.
15. What is the principal Agent Problem in equity contracts? How can they be solved?
16. Discuss the role of margin requirements in futures contracts

17. Why are options and futures labelled derivative securities?
18. Does the presence of Deposit Insurance Corporation lead to both moral hazard and adverse selection problem?
19. Distinguish between symmetric imperfect information and asymmetric information. Why does adverse selection arise?
20. By investing in reputation for being tough to defaulters, a bank can reduce the negative impact of asymmetric information. Explain.
21. "If one person gains from a financial transaction, someone else loses. Thus, futures markets benefit either buyers or sellers, but not both." Agree/Disagree? Justify.

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TOPIC – 3

CHAPTER – 3.1

TIME VALUE OF MONEY

A **debt instrument** is a written promise by a borrower to pay to the owner of the instrument a specified amount in the future. These can be one time payments or stream of payments.
These debt instruments can be short term or long term.

The market for short term debt is called **money market**. Instruments like treasury bills, commercial paper and repurchase agreements are bought and sold here.

The market for long term debt is called **capital market**. Instruments like treasury bonds and corporate bonds are bought and sold here.

To determine the prices at which these instruments are valued it is important to know what they yield to the lender.

Instruments sold on discount basis – Some instruments like treasury bills, some corporate bonds do not pay interest directly

rather they are sold at prices less than their face value i.e. on a discount basis. At maturity the holder of the bond gets the face value.

Return to owner = Face value – Price

Yield of a discount bond is a measure of the percentage annual return earned by the owner of the instrument.

It can be measured in the following ways -

1. **Discount Yield (DY)**

   DY = (FV-P)/FV * 360/Days to Maturity

   DY*100 gives the percentage return.

   FV- Face value

   P- Price paid

   Although this measure is frequently used, but DY actually underestimates the actual yield because of the following reasons:

   (a) We multiply by 360 rather than a standard 365 day year. (360<365 thus DY<actual yield)

   (b) Actual return from discount bond would be calculated by the formula (FV-P)/P i.e. as proportion of the price that is paid. (P<FV because it's a discount bond thus DY<actual yield)

2. **Yield to Maturity (YTM)**

   YTM is the interest rate at which the amount used to purchase the Treasury bill (P) would have to be invested to grow to the face value paid at maturity.

   P = FV/ (1+YTM) or

   YTM = (FV/P) – 1

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Example - Consider a 1 year treasury bill with FV= $1000. Suppose the price paid for it is $900, then

DY = (1000-900)/1000 * 360/365 = 0.098

So the discount yield is 9.8%

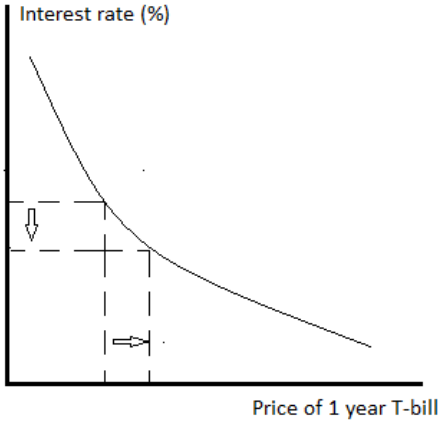
For YTM

900 = 1000/(1+YTM) => YTM= 0.111

So the yield to maturity is 11.1%

Valuing discounted debt instruments

The maximum price that a lender will be willing to pay for a discounted bond depends on what he could earn by lending the money he has in the market at the market interest rate 'i'. If i is high (he can earn high returns in the market) then he would be willing to pay less for the bond because he wants to get at least as much yield from the bond as i, and yield is inversely proportional to P. The limiting situation is **YTM=i**. Thus P_{max} is inversely proportional to **i** i.e. higher the 'i' lower the P_{max} and vice versa. If the borrower asks for a higher price for the bond the lender won't buy, price greater than P_{max} means the yield would be less than i and thus he has no incentive to buy it.



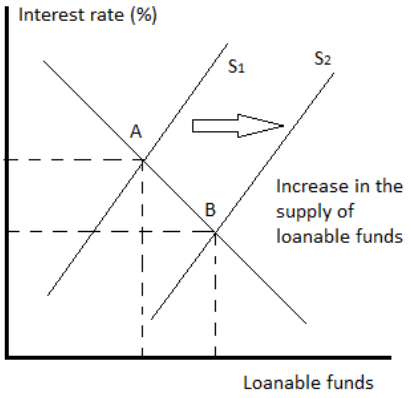
'i' is determined in the market for loanable funds by the interaction of demand and supply. The demanders of loanable funds are the borrowers and suppliers are lenders.

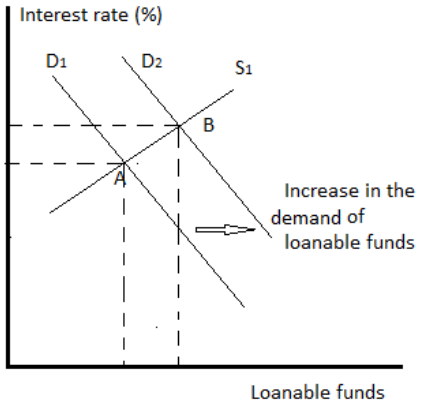
Variables that can lead to shift in demand and supply of loanable funds are:

An increase in	**Shift in Demand curve**	**Shift in Supply curve**	**Impact on i**
Inflationary expectations	Rightward (borrowers expect i to go up in the future so demand more today)	Leftward (lenders expect **i** to go up in the future so they reduce lending today)	Increases
Wealth	No effect	Rightward (as wealth goes up, people have more to lend)	Decreases
Tax rate on interest income	No effect	Leftward (as tax charged on interest income increases, lenders lend less)	Increases
Size of govt.	Rightward	No effect	Increases

budget deficit	(govt. borrows more)		
Tax deductibility of household interest payments	Rightward (as household interest payments are deducted while calculating taxable income thus they borrow more - tax benefits)	No effect	Increases

As the interest rate falls, the price of debt instruments sold on discount basis increases.





Interest bearing debt instruments

The debt instruments which provide a regular interest payment in addition to paying their face value on maturity are called interest bearing debt instruments such as coupon bonds. A coupon bond specifies two things (i) face value i.e. FV (ii) coupon rate i.e. CR (determines the % of the face value that would be paid as interest each year). The owner may or may not pay the face value of the bond as the price. It depends on the relationship between the coupon rate and the market interest rate whether P (> or = or <) FV.

The yield of such bonds can be calculated in the following ways-

1. **Current Yield (CY)**

   It is the ratio of the annual coupon payment to the price paid for the bond.

   CY = (CR * FV)/P

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If price paid for the bond is more than its face value then coupon rate will be more than the current yield (i.e. yield is less because price paid is high).

A problem with CY as a measure is that it doesn't take into account the fact that on maturity of the bond, the FV is also given back. So we use another measure yield to maturity.

2. Yield to Maturity (YTM)

YTM is the interest rate at which the price paid for the bond would have to be invested to return the stream of payments (note, here not only the face value in one go but interest payments for some years and then face value is being paid, it is a stream of payments) generated by the bond.

It takes into account both FV and coupon payments.

Example - Consider a 1 year bond with FV=1000, CR=10% and P=900

CY= .10*1000/900 = .1111

So the current yield is 11.11%

For YTM

900 = (100+1000)/(1+YTM)

YTM= .2222

So yield to maturity is 22.22%

If FV > P then YTM > CY > CR.

If FV < P then YTM < CY < CR.

Since YTM also takes into account the FV, so the impact (either negative or positive i.e. higher price or lower price) is more in case of YTM than CY.

EurekaWow

Valuing interest bearing debt instruments

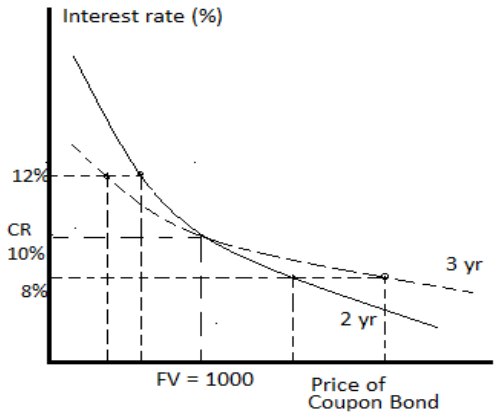
The price of the coupon bond reflects the present value of all future payments the bondholder will receive i.e. the present discounted value (PDV) of the stream of payments that the bond promises.

As explained earlier, value is determined by 'i' the market rate of interest, here it is used to discount the stream of payments.

$P = PMT/(1+i) + PMT/(1+i)^2 + PMT/(1+i)^3 + \ldots (PMT + FV)/(1+i)^T$

For a T year bond (PMT refers to the coupon payments)

It can be seen that if **CR > i** then the price people are willing to pay for the bond can be higher than the face value. The bond then becomes an attractive investment opportunity offering higher returns than the market i would.



As seen earlier, there exists an inverse relationship between the price and the market interest rate.

However one additional point to be noted here is that the relationship between P and i is dependent on the maturity period of the bond.

Comparing a 2 and a 3 year bond, we see that because of longer maturity, the effect of a change in interest rate on price is greater for a 3 year bond than a 2 year bond. (Can be verified from the formula too) Suppose **i** falls, so price of bonds increases. The increase in price of 3 year bond is more because the impact of lower **i** will be more (now the money is locked in for 3 years rather than 2)
So the **'i-P'** curve is flatter for a bond with longer maturity.

CHAPTER – 3.2

RISK AND UNCERTAINTY

Risk- Situation in which we cannot exactly predict the outcome, but know the probable outcomes and the probabilities of their occurrence.
Uncertainty- Situation in which individuals cannot form probabilities for outcomes either because they can't predict possible outcomes or they can't estimate the associated probabilities.

Risk Preference
Talking about preference of individuals over risk, we can divide them into three categories:

- **Risk Averse**: Given two options with the same expected payoffs, such individuals choose options with a lower variance. Alternatively, they prefer a sure thing to a risky option given the same expected payoff.

EurekaWow

- **Risk Neutral**: Such individuals are indifferent between options with same expected payoffs, irrespective of the variance/risk associated with each option. Alternatively, they differentiate between options only on the basis of expected payoffs.
- **Risk Loving**: Given two options with the same expected payoffs, such individuals choose options with a higher variance. Alternatively, they prefer a risky option to a sure thing given the same expected payoff.

Valuing risky financial assets

Individuals will pay less for risky assets because of the following two reasons:

1. Risk free asset will generally have a higher expected repayment than a risky asset (e.g. a good borrower's probability of repayment is higher than bad borrower's which means the expected repayment of less risky asset i.e. loan to good borrower is higher). So, a lower expected payment leads to lower price.
2. Even if the expected payoffs are the same, since mostly individuals are risk averse, they would be willing to pay less for a risky asset as compared to a risk free asset. A lower price means they demand a higher interest payment from risky assets.

The difference between the interest rate on a risky asset and that on a risk free asset is known as **risk premium**.

There are various **types of risks** associated with assets which create a gap between the interest rates of various assets i.e. risk premium.

1. **DEFAULT RISK**

   It is the risk that a borrower will fail to make the stipulated debt payments. When the issuer of a debt instrument fails to make required payments when due, the instrument is in default.

   This is associated with the **creditworthiness** of the issuer.

   The instruments issued by the US treasury are considered to be risk free (nearly; increasing federal debt may reduce credibility) because it is known to all that to repay its obligations, it can increase taxes or print more money and thus the chances of default are negligible. On the other hand, the debt issued by a small not so famous company is very risky, because there isn't any guarantee whether it would be able to earn enough profits to repay. Thus only a very high interest rate offered on it can attract individuals to buy it (risk premium).

   Firms in strong financial position will have lower default risk than firms in weaker position.

   Default risk premium is the premium a borrower must pay to compensate a lender for the risk of default.

   We can see the concept with the help of an example.

   Suppose there is a risk neutral individual (Z) operating in market with i = 5%who has two options:

   (a) 1 year Government bond, FV= 1000, CR= 5%

   So, the price that Z is willing to pay for this bond is

$$P = \frac{1000 + .05 * 1000}{1 + .05} = 1000$$

(b) 1 year corporate bond with rating B* - 90% chance that the debt would be repaid, 10% nothing is repaid
FV=1000, CR=5%

The price that Z is willing to pay for this bond depends on the expected stream of payments

$Exp\ value = .90 * 1050 + .10 * 0 = 945$

$$P = \frac{945}{1 + 0.05} = 900$$

So we can see from the above example that a default free bond sells for a higher price than another bond with same specifications otherwise but default risk.

Bond rating (lowest default risk to highest)
Aaa
Aa
A
Baa
Ba (and so on)

Another way to look at default risk premium is by calculating YTM of each bond (under the assumption that both had actually met their obligations in the end).

For the government bond $1000 = \frac{1050}{1+YTM(g)}$

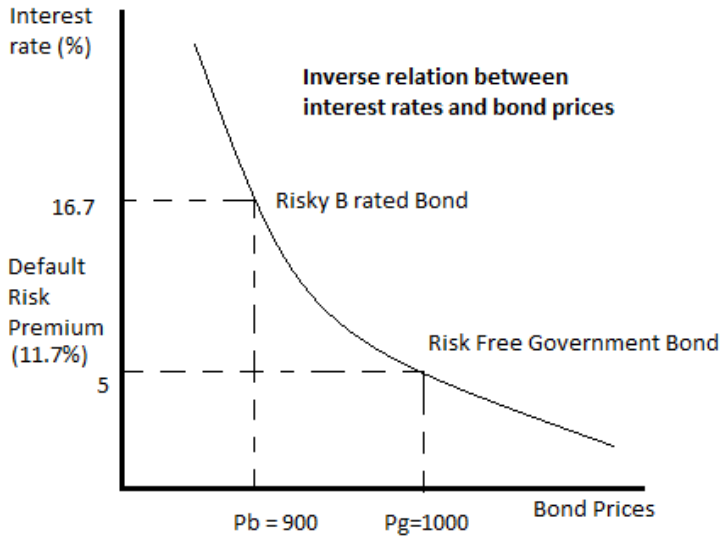
This gives us YTM (g)= 5%

Similarly for the corporate bond $900 = \frac{1050}{1+YTM(c)}$

This gives us YTM (b)= 16.7%

This shows that the rate at which price paid for the risk free bond should grow is lower than for risky bond to be able to repay the same amount.

Default risk premium= 16.7% - 5% = 11.7%



The default risk premium decreases as credit worthiness increases i.e. now if a bond was offered with probability of repayment being 99% then it's price would be less than option (b) and higher than option (a).

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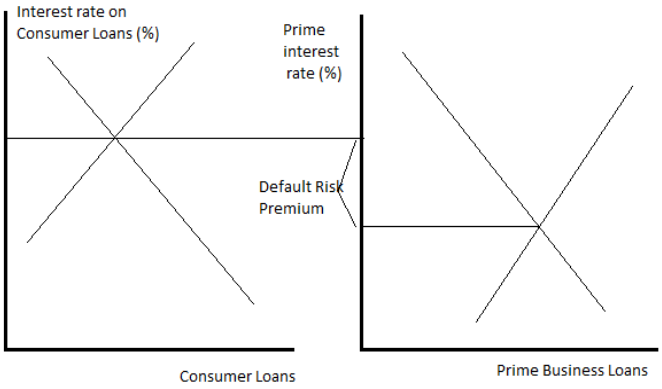


Till now we assumed the individual to be risk neutral so what mattered to him was only expected payoff. Dropping this assumption if we now consider a risk averse individual, it should be noted that he would demand even higher interest rate in case of risky asset because now he has two considerations bothering him, one being the lower expected payoff, the other being higher risk and he should be compensated for both.

Thus the default premiums in markets dominated by risk averse individuals is even higher than in case of risk neutral investors.

2. LIQUIDITY RISK

Liquidity risk is the risk concerning the price an investor will receive if a debt instrument is liquidated prior to maturity.

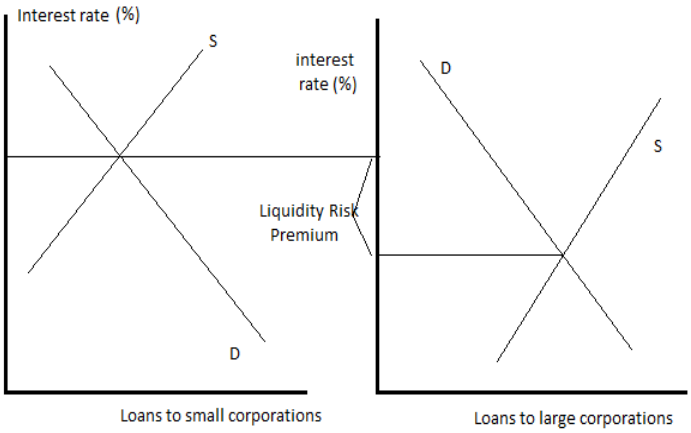
Liquidity is the ease with which the owner of any debt instrument can sell it without loss to obtain money. This depends on the existence of a secondary market for that

particular instrument. If the market is thin, it is difficult to sell it to obtain money prior to maturity.

Liquidity risk is related to the creditworthiness of the issuer. If the issuer of a debt instrument is widely known to be creditworthy then people would be willing to buy these instruments in the secondary market and thus reducing the liquidity risk. It is difficult to find buyers for the instruments issued by small corporations as many don't know about their repaying capability.

Thus even in the absence of any default risk, there might exist a gap in the interest rate of instruments due to difference in liquidity.

Liquidity premium is the additional interest rate that lenders must receive as compensation for liquidity risk. Existence of this premium can be seen from the demand-supply interaction in the market for loanable funds.



Given certain demand for loanable funds by say the government on one hand and a non-listed corporation on the other. Since there isn't much creditworthiness attached to the non-listed corp. thus secondary market is thin and liquidity risk is higher. This higher risk implies that the supply of loanable funds for these corps. would be less as compared to that for the government bonds/ bonds issued by listed corp. Thus lower supply means higher interest rate for non-listed corp. as compared to the other case of listed corp. /government. This difference constitutes liquidity premium.

Since **i and P are inversely related**, thus the price of the bond of non-listed corporation is lower than the government/ listed corporation's bond. From here we can see that if the liquidity of bonds decreases, the value of portfolio of an investor will fall.

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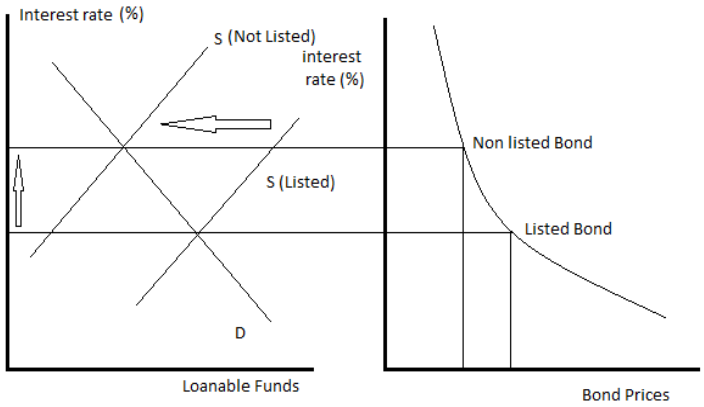

3. INTEREST RATE RISK and CALL RISK

Interest rate risk is the risk of a change in the overall level of interest rates. (This risk also gives rise to liquidity risk)

Due to existence of interest rate risk, there is an additional risk known as call risk (with callable bonds) - the risk that the issuer of a callable bond will call the bond i.e. pay the bond's face value prior to maturity.

Suppose a bond is issued with a certain coupon rate (given market interest rate), if the interest rate in the market declines, the issuer has an incentive to call back the old loan paying back the face value and issuing new loans with lower coupon rates. The lender thus loses the coupon payment if the bond is called back.

Example – There is a 1 year bond with CR=8%, FV=1000 (no default risk, non-callable bond)

If the market **i** = 8% and the price of the bond = 1000, YTM=8%

Now we consider two cases

Case I - After purchase of the bond, **interest rate falls**: i' = 4%

In case of a non-callable bond, no change occurs with the payments, though present value changes

$$P = \frac{1000 + .08 * 1000}{1 + .04} = 1038.46$$

This means that today the same bond that you bought for 1000 would be sold for 1038.46 in the market. Thus your yield is still 8% even when the interest rate has fallen.

Note: This change in price would have been higher if the maturity of the bond was longer because then the higher interest rate (8%) is locked in for more years.

The issuer of a callable bond in such a situation will have an incentive to call back his loan, pay 1000 to the lender and issue new bonds with CR=4%

This will have a negative impact on the lender as now he would not be able to buy a bond with 1000, he needs additional 38.46, and even if he spends this additional amount he would get a yield of only 4%. As a result they demand a higher interest rate on bonds which are callable to compensate for the additional risk.

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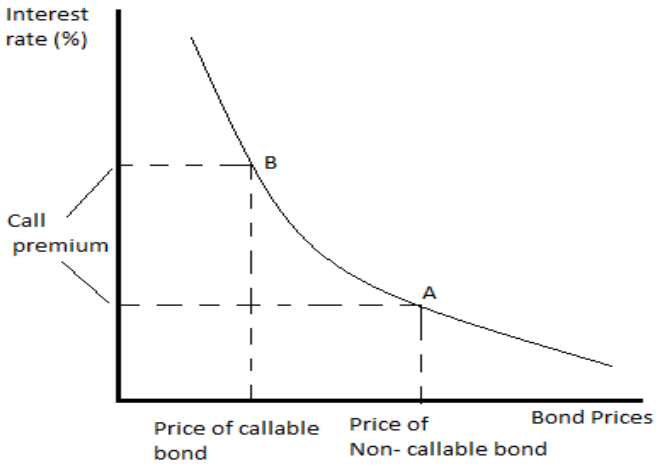


<u>Case II</u> - **Interest rate rises**: i' = 12%

$$P = \frac{1000 + .08 * 1000}{1 + .12} = 964.29$$

As the interest rate rises, the bond with coupon rate 8% falls in value. On fresh issues, a higher interest rate would be paid and thus the old bond will have to be sold on discount so that returns are same.

If this bond is sold right after purchasing when the interest is higher, there is a loss of 35.71.
However if the issuer call backs this bond now, he would pay 1000 and this can be then used to purchase new bond paying 12% returns.

The above analysis shows that a lender can both gain or lose by purchasing this callable bond, lose if interest falls and bond is called back and gain if interest rises and the bond is called back.

However interestingly a lender actually only loses by purchasing this bond. This is because the borrower will only

call back the bond when interest rate falls; when it rises he has no incentive to call back- thus we can rule out the only situation when the lender could gain from the calling back of the loan. What is left is only a loss when interest falls and no gain when it rises.

As a result investors pay a lower price for callable bonds than for non-callable bonds which imply a higher rate of interest on callable bonds and a lower on non-callable bonds. The additional yield purchasers of callable bonds must receive to be willing to expose themselves to call risk is **call premium**.

Capital Gains and interest income on a bond:
The owner of a bond receives income from two sources
(i) Interest income on the bond at the time of purchase
(ii) Capital gain (change in price relative to purchase price)

From the above example we can see that when interest rate fell to 4% price increased to 1038.46
This means a gain of 38.46 (38.46/1000*100 = 3.8%) – Capital gain
Total return = 8% + 3.8% = 11.8%

4. INFLATION RISK

In case of a loan agreement, the lender provides current funds to a borrower who promises to pay back in the future. But the future purchasing power/value of money may not be the same; it might erode with inflation. The same amount paid would be worth less if inflation is higher. Thus investors want a compensation for the lost purchasing power, a

premium to cover their expectation of inflation (such that the real interest rate received is the same).

Fisher's equation: $\mathbf{i = r + \pi^e}$

The lender receives the nominal interest rate, and π^e here represents the **inflation premium** that compensates the lender so that he receives the same real payments.

This however is only one part of the inflation story where the lender demands interest depending on his expectations about the future inflation which may or may not be equal to the actual inflation in the future. This leads to an additional risk, the **inflation risk**- that the actual inflation would differ from the expected inflation. This gives rise to the **inflation risk premium**.

Example - Suppose you are a lender and expect inflation π^e = 2%. The nominal interest rate i = 7%, this means that you expect to receive a real rate r = 5% (7%-2%)

We can consider <u>two situations</u> now

(a) If actual inflation π = 6% then it means that you get r = 1% instead of the 5% that you were expecting. Thus you (lender) are worse off whereas the borrower now pays only 1% real rate instead of 5% thus he is better off.

(b) If actual inflation π = 0% then it means that you get r = 7% instead of the 5% that you were expecting. Thus you (lender) are better off whereas the borrower now pays 7% real rate instead of 5% thus he is worse off.

Inflation risk is faced by both the lender and the borrower- a higher than expected inflation benefits borrowers (by reducing the real value of their obligations) and hurt lenders whereas a lower than expected inflation benefits lenders and hurt borrowers.

5. TAX RISK

It is the risk of changes in the tax treatment of interest income.

Interest income from various bonds like corporate bonds etc are subject to taxes. On the other hand some bonds like the municipal/federal bonds are tax free. The issuers of such tax free bonds are capable of selling bonds with lower interest rates which provide returns at par with other bonds' after tax returns.

Example – Suppose there are two bonds identical in all respects except their tax treatment- a municipal bond (tax free) with YTM 6% and a corporate bond with YTM 9%. The tax rate applicable is 38%.

$$\text{After tax YTM of the corporate bond} = .09 - .38 * .09 = (1 - .38) * .09 = .09 * .62 = 0.0558$$

Thus the effective YTM of the corporate bond is 5.58%.

The municipal bond pays 6% before and after tax and thus the comparison should be between the 5.58% and the 6% yields rather than 9%.

Changes in tax rates on interest income affect the after tax return from investments, thus the risk of future changes in tax policy indirectly leads to interest rate risk. This risk lowers

the price of bonds the income from which is taxable. In periods of tax policy uncertainty, the price of tax free municipal bonds increases.

Having discussed about the various types of risks that exist, we now move on to the ways to mitigate some of them. In particular we see three ways:

1. **Diversification**

It means you don't put all your eggs in the same basket i.e. you spread across various assets the money you want to invest. The portfolio has a mix of different assets which helps reduce risk if instruments are carefully chosen.

Suppose you have Rs. 1000 to invest and two options

(a) Ice cream parlor (works only when it's hot)

(b) Tea stall (works only when it is cold)

The probability that it would be hot is 1/2 and it would be cold is 1/2

During hot days the ice cream parlor gives a return of Rs. 100 but only Rs. 20 when it is cold.

Similarly on cold days the tea stall gives a return of Rs. 100 but only Rs. 20 when it is hot.

If you invest all your money in the ice cream parlor

$$Expected\ return = .5 * 100 + .5 * 20 = 60$$

$$Variance = .5 * (100 - 60)^2 + .5 * (20 - 60)^2 = 1600$$

If you invest everything in the teas stall

$$Expected\ return = .5 * 100 + .5 * 20 = 60$$

$$Variance = .5 * (100 - 60)^2 + .5 * (20 - 60)^2 = 1600$$

We can see that both investments have the same expected payoff as well as the variance i.e. risk associated. However one major difference is in the fact that ice cream parlor earns more when it is hot and tea-stall when it is cold. So if you could diversify your investment you can reduce the risk associated.

If you put Rs. 500 in the ice cream parlor and Rs. 500 in the tea-stall
During hot days you get Rs. 10 from the tea stall + Rs. 50 from the ice cream parlor = Rs. 60
During cold days you get Rs. 50 from tea stall + Rs. 10 from the ice cream parlor = Rs. 60
Which means the

$$Expected\ return = .5 * 60 + .5 * 60 = 60$$
$$Variance = .5 * (60 - 60)^2 + .5 * (60 - 60)^2 = 0$$

Thus diversification helped us reduce the risk associated with individual projects.

Diversification can help reduce risk only when securities bought move in opposite direction in response to a risky event (they should be negatively correlated).

2. **Futures Contract** (Topic 2)
3. **Options Contract** (Topic 2)

CHAPTER – 3.3

TERM STRUCTURE OF INTEREST RATES

Yield curves – A curve that summarizes the yields one can earn from otherwise identical debt instruments of varying maturities. Along a yield curve we keep constant- the date at which yields are relevant and default risk.

Term structure of interest rates- It is the relationship between term to maturity and yields.
Yield curves are generally upward sloping with a few episodes of flat or downward sloping yield curves also witnessed.

To explain the shape of yield curves we have various theories:

I. The Expectation Hypothesis

Principle: longer term interest rates are an average of the shorter term interest rates expected to prevail during the life of the longer term asset.

Assumptions:

(a) Short term and long term bonds are perfect substitutes
(b) Investors are risk neutral and thus are not willing to pay premium to lock money for more years
(c) Transactions costs (of converting bonds and buying new bonds etc.) are zero.

Implications:

Given the assumptions the only way borrower can attract long term funds is to offer a long term interest rate that gives

investors the same expected return they could earn on a sequence of short term investments.

Suppose X has 10000 to invest for two years. Current one year interest rate on CD is 4% and next year it would pay i%. Thus if a CD is purchased today and then from the money received next year another one year CD is purchased then $V = 10000(1 + 0.04)(1 + i)$

This **i** can't be judged with certainty and thus $\mathbf{E_1 i}$ i.e. expected **i** is used instead.
The higher the expectation of **i**, higher is the value **V**.

Suppose bank wants people to buy CD's with longer term maturity also, for that it would have to give them the same expected payoff (investors risk averse) $V' = 10000(1 + i')^2$

- If V>V' investors would buy only short term bonds
- If V<V' they would buy only long term bonds
- Only when V=V' would they be indifferent, some would buy long term and some short term bonds.

Thus $10000(1 + 0.04)(1 + E_1\mathrm{i}) = 10000(1 + i')^2$
Thus $1 + i' = \sqrt{(1 + 0.04)(1 + E_1 i)} = 1.05$
Thus i'=0.05 and only this rate would induce investors to buy long term bonds.

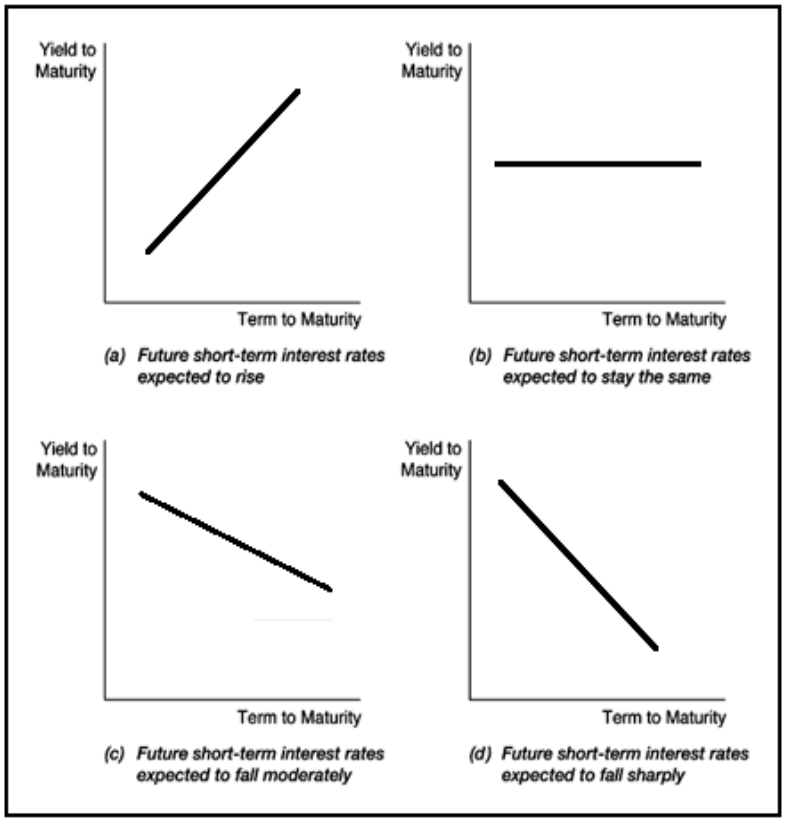
Generalizing the above argument we get:

$$i^n = \sqrt[n]{(1 + i)(1 + E_1 i)(1 + E_2 i)(1 + E_3 i) \dots (1 + E_{n-1} i)} - 1$$

This is equivalent to,

$$i^n = \frac{i + E_1 i + E_2 i + E_3 i \ldots E_{n-1} i}{n}$$

EXPECTATIONS HYPOTHESIS



It can be seen by plugging in values of $E_1 i$ that if

- $E_1 i > i$ then $i' > i$ thus yield curve upward sloping
- $E_1 i < i$ then $i' < i$ thus yield curve downward sloping
- $E_1 i = i$ then $i' = i$ thus yield curve flat

Drawback: Here the varying shape of the yield curves is due to different expectations of future one year rates.

Expectation hypothesis implies that investors almost always expect future rates to be higher than current rates.

II. The Segmented Market Hypothesis

Principle: Investors have a preference for financial instruments with varying maturities which they are not willing to change.

Assumptions:

(a) There exists transaction cost, effort, time values for conversion of bonds thus they buy according to specific maturity preferable to them.
(b) Bonds with different maturities are not substitutable, markets are separated.
(c) There exist interest rate risks.

Implications:

Bonds with different maturities are not substitutable for one another, their yields are determined independently of one another. It believes that the markets for bonds with varying maturities are separate and yield is determined by intersection of demand and supply in each market. The yields are solely determined by preferences over long and short term instruments.

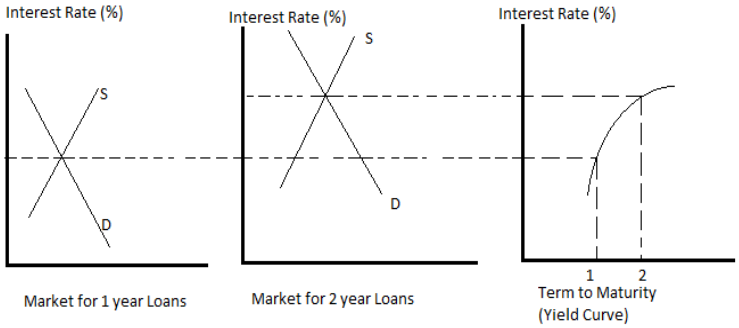
For a given demand for loanable funds when the supply of short term loanable funds is greater than the supply of long term loanable funds, short term rates will be lower than long term rates. Thus we can say that according to this hypothesis

the shape of yield curves is determined from the separate markets (demand-supply intersections)

Drawbacks:

- Not very useful to predict changes in pattern of yields, only states that a change in preference for loans with different maturities would change the shape of yield curve.
- It implies that short term and long term rates are completely unrelated, however this is not the case.

Segmented Market Hypothesis and Upward Sloping Yield Curve



III. The Preferred-Habitat Hypothesis

Principle: It is a combination of the above two hypothesis. It says that though investors have preferences for loanable funds of a given term, they are willing to substitute away from their preferred terms if they are compensated for doing so. This compensation required to induce investors to buy an asset with a different term to maturity than the preferred terms is known as **term premium**.

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Implication:

Investors will choose bonds on the basis of both

- the expected return of the bond and
- the investor's preference for bonds with a particular maturity

Term premium is the additional yield required to induce the investor to purchase a bond with a term that is not exactly in line with the investor's preference.

Thus the equation we saw above for expectation hypothesis changes to

$$i^n = a_n + \frac{i + E_1 i + E_2 i + E_3 i \ldots E_{n-1} i}{n}$$

Where $\mathbf{a_n}$ is the term premium.

This term premium can be justified- transactions cost, brokers fees, cost of time and effort that exist have to be borne by the investors if he tries to liquidate his longer term bonds before maturity. Thus if someone prefer short term bonds he'll have to be given term premium to buy long term bonds.

I and II are the extreme versions of this hypothesis

- $a_n = 0$ in case of expectation hypothesis, no premium required as they are perfect substitutes
- $a_n = \infty$ in case of segmented market hypothesis, no premium can induce investors to change their preferences.

To determine the shape of yield curves:

Suppose $a_n = 0.01$

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i = 0.06

Then

$$i^2 = 0.01 + \frac{0.06 + E_1 i}{2}$$

Case 1 - If E_1i=0.20 then i_2 = 0.14 i.e. investors expect interest rates to increase next year thus i_2 is higher

Yield curve is upward sloping when investors expect interest rates to go up.

Case 2 - If E_1i=0.04 then i_2 = 0.06 i.e. investors expect interest rates to increase next year thus i_2 is higher because of term premium. An upward sloping yield curve is compatible with lower interest expectations.

Case 3 - If E_1i=0.01 then i_2 = 0.045 i.e. investors expect interest rates to decrease drastically next year thus i_2 is lower. Yield curve is downward sloping when investors expect sharp decline in interest rates.

Thus we can see that preferred habitat hypothesis is capable of explaining the various shapes yield curves take. It shows that even if interest expectations fall slightly or are constant, yield curves will be upward sloping because of term premium. They would slope downwards only when there is sharp decline in expected interest rates.

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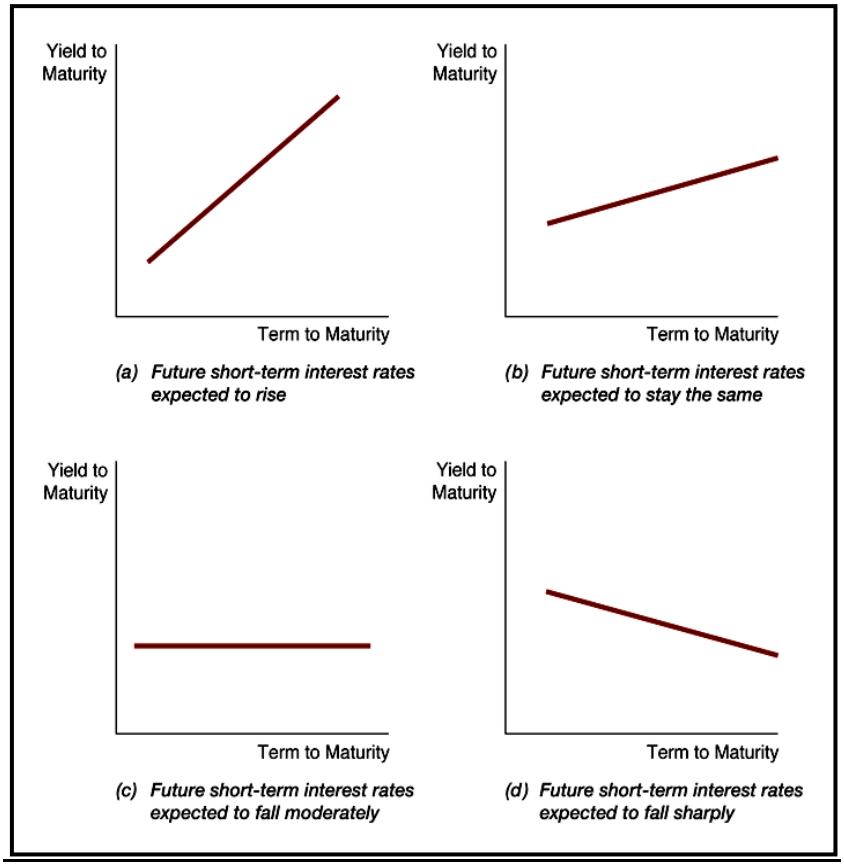
PREFERRED HABITAT HYPOTHESIS



Information content of a yield curve

Yield spread- It is the difference between yields on two debt securities of different maturities.

Hypothesis 1: Reflects stance of the monetary policy

Low yield spread → tight monetary policy

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The CB influences short term interest rates through monetary policy, this gradually gets transmitted to longer term securities. For example when monetary policy is tightened long term interest rates rise but less than short term interest rates giving rise to a flatter yield curve or even negatively sloped curve.

Hypothesis 2: Contains information on future interest rate movements

Yield curve possess significant forecasting ability for future short term interest rates. A significant positive correlation has been witnessed between yield spread and future short term interest rate changes.

Hypothesis 3: Reflects direction of future inflation changes

Low yield spread → credibility of monetary authority in curbing inflation

If investors expect a rise in future inflation, they demand higher interest rates on long term bonds steepening the yield curve. However higher credibility of the monetary authority reduces inflation risk premium and investors demand lesser nominal yield thus flattening the yield curve.

Hypothesis 4: Contains information on credit market conditions and growth

High yield spread → stronger recovery from recession

Yields on long term bonds is countercyclical, as people turn risk averse during recessions' price of long term bonds decreases as demand decreases (higher risk) and thus yield increases. Yields on short term bonds are pro-cyclical, as people expect accommodative monetary policy. Thus short term rates stay low

whereas long term rates increase leading to steeper yield curves during recessions.

If recovery is expected then borrowers float long term bonds for investment purposes, more supply would reduce the price and increase the yield. Higher the long term yield means more is the supply of such long term bonds thus people are mobilizing resources to invest. This implies a steeper yield curve indicates recovery. With the same argument we can say that a flatter curve would mean stagnant economy and downward sloping implies absence of investment opportunities and thus recession.

A sovereign yield curve is important as seen above. But in case of emerging economies such a curve is either absent or is not as informative because of:

1. Financial repression- rigidities, lack of infrastructure, technology, institutions required for market forces to operate as well as lack of a liquid and deep market for domestic sovereign bonds.
2. Fiscal deficit- very high fiscal deficits in EME's and underdeveloped corporate bond markets
3. Co-existence of securities issued by CB as well as government which leads to market fragmentation
4. Securities with same maturity have different yields because of difference in sizes, discounts etc. thus making it difficult to build one yield curve

EME's have a flatter yield curve because:

- These countries experience large foreign capital inflows which lead to excess liquidity in the economy thus long term yields fall and yield curves are flatter.
- The investors in EME's are generally hold to maturity kind of investors and they do not shuffle their portfolios now and then (dominance of institutional investors, regulatory guidelines etc.). They are immune to the market risks and thus they have less incentive to keep short term bonds, the demand for long term bonds if higher thus they have flatter yield curves.
- The increased credibility of monetary policy lowers inflation expectations thus long term yields.
- High savings rate is another contributor to flatter yield curve.

QUESTIONS

1. Discuss the preferred habitat hypothesis to explain shape of yield curve.
2. Determine the prices and yields of the following 1-year debt instrument when market rate of interest is 9% (a) Rs 10000 T-bills. (b) Rs. 1000 corporate bond with coupon rate of 10%
3. What is held constant along yield curve? What is allowed to vary?
4. Explain the rationale for the expectations hypothesis. When would the yield curve slope upward according to this hypothesis? When will it slope downward?
5. Explain how the expectations and the market segmented hypothesis are the extreme versions of the preferred habitat hypothesis. Illustrate.

6. The interest rate on a 1 year government bond is 4%. The rate on 2 and 3 year government bonds are 7% and 9% respectively.
   (a) Describe the shape of yield curve
   (b) Use the expectations hypothesis to determine the market's forecast of the one year rate next year.
   (c) What is the market's forecast of the one year rate in two years?
7. Suppose investors prefer 1 year bonds to 3 year bonds and will purchase a 3 year bond only if they expect to receive additional 2 % over the return from holding 1 year bonds. Currently 1 year bonds yield 3% but investors expect it to rise to 4% next year and 6% the year after. (a) Which of the three models of term structure is relevant? (b) What is the shape of yield curve? (c) What is the yield on a 3 year bond? *(Refer to Baye and Jansen, Chapter 10 for solution)*
8. Use supply and demand graphs to illustrate the impact of the following changes on the interest rate a firm pays for loanable funds.
   (a) An increase in the firm's default risk
   (b) Decrease in the liquidity risk of firm's bonds
   (c) Increase in inflationary expectations
   (d) Increased uncertainty about future tax treatment of interest income
9. Explain why an investor who purchases a callable bond requires a call premium.
10. Provide two reasons why risky bonds sell at lower prices (and higher yields) than default free bonds.

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11. Moody's recently downgraded XYZ's bonds from Aaa to C. What impact would you expect this to have on (a) the price of XYZ's bonds. (b) the interest rate XYZ must pay for additional loanable funds (c) the default premium paid by XYZ?

TOPIC – 4

CHAPTER – 4.1

BASEL –III – SPEECH BY D. SUBBARAO

Subbarao tries to answer some of the conceptual and implementational issues underlying Basel III.

What is Basel III?

Basel III released in December, 2010 is the third in the series of Basel Accords which deal with risk management aspects of the banking sector. Basel I and II are the earlier versions of the same, and are less stringent.

1st Question: There is a view that it was actually the risk sensitive framework of Basel II that caused the crisis. Is that view valid?

Answer:

The paradigm shift from Basel I to Basel II – Basel I had a "one size fits all" approach, Basel II introduced risk sensitive capital regulation. Charges against Basel II –

(a) The risk sensitivity of Basel II made it procyclical - In good times, when market is willing to invest capital, Basel II does not impose significant additional capital requirement on banks and in stressed times, when banks require additional capital and markets are wary of supplying that capital, Basel II requires banks to bring in more of it.

(b) Basel II did not bring in corresponding changes in the definition and composition of regulatory capital to reflect the changing market dynamics – The market risk models failed, to factor in the risk from the complex derivative products that were coming on to the market at large. So, it failed to promote modeling frameworks for accurate measurement of risks.

(c) Concerning leverage - Basel II assumed that its risk based capital requirement would automatically mitigate the risk of excessive leverage which was flawed as excessive leverage of banks was one of the prime causes of the crisis. Basel II did not explicitly cover liquidity risks.

(d) Ignorance of systemic risks – Basel II focused exclusively on individual financial institutions, ignoring the systemic risks arising from the interconnectedness across

institutions which spread the crisis across financial markets.

However to conclude that Basel II caused the crisis would be extreme. The view is partly valid as Basel II came in 2006 and was in progress when the crisis occurred.

2nd Question: How is Basel III an improvement over Basel II?

Answer: The enhancement of Basel III over Basel II is seen in four areas:

- Augmentation in the level and quality of capital
- Introduction of liquidity standards
- Modifications in provisioning norms
- Better and more comprehensive disclosures

1. Better Capital Quality: One of the key elements of Basel III is the introduction of much stricter definition of capital. Better quality capital means the higher loss-absorbing capacity. This in turn will mean that banks will be stronger, allowing them to better withstand periods of stress.

2. Capital Conservation Buffer: Another key feature of Basel III is that now banks will be required to hold a capital conservation buffer of 2.5%. The aim of asking to build conservation buffer is to ensure that banks maintain a cushion of capital that can be used to absorb losses during periods of financial and economic stress.

3. Countercyclical Buffer: The countercyclical buffer has been introduced with the objective to increase capital requirements in good times and decrease the same in bad times. The buffer will slow banking activity when it overheats and will encourage

lending in bad times. The buffer will range from 0% to 2.5%, consisting of common equity or other fully loss-absorbing capital.

4. Minimum Common Equity and Tier 1 Capital Requirements:
The minimum requirement for common equity, the highest form of loss-absorbing capital, has been raised under Basel III from 2% to 4.5% of total risk-weighted assets. The overall Tier 1 capital requirement, consisting of not only common equity but also other qualifying financial instruments, will also increase from the current minimum of 4% to 6%. Although the minimum total capital requirement will remain at the current 8% level, yet the required total capital will increase to 10.5% when combined with the conservation buffer.

5. Leverage Ratio: A review of the financial crisis of 2008 has indicated that the value of many assets fell quicker than assumed from historical experience. Thus, now Basel III rules include a leverage ratio to serve as a safety net. A leverage ratio is the relative amount of capital to total assets (not risk-weighted). This aims to put a cap on swelling of leverage in the banking sector on a global basis. 3% leverage ratio of Tier 1 will be tested before a mandatory leverage ratio is introduced in January 2018.

6. Liquidity Ratios: Under Basel III, a framework for liquidity risk management will be created. A new Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) are to be introduced in 2015 and 2018, respectively.

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7. Provisioning Norms: Adoption of an **expected loss** based measure of provisioning which captures actual losses more transparently and is also less procyclical than the current **incurred loss** approach is being supported by the Basel Committee. This approach will make financial reporting more useful for all stakeholders, including regulators and supervisors.

8. Disclosure Requirements: One of the lessons of the crisis is that the disclosures made by banks on their risky exposures and on regulatory capital were neither appropriate nor sufficiently transparent to afford any comparative analysis. To remedy this, Basel III requires banks to disclose all relevant details, including any regulatory adjustments, as regards the composition of the regulatory capital of the bank.

3rd Question: What is the additional capital that Indian banks have to mobilize to conform to Basel III? What are the options for, and challenges in, raising this size of capital?

Answer: Keeping two facts into consideration,

- Risk weighted assets of individual banks will increase by 20 per cent per annum
- Internal accruals will be of the order of 1 per cent of risk weighted assets

The Reserve Bank estimated an additional capital requirement of 5 trillion, of which non-equity capital will be of the order of 3.25 trillion while equity capital will be of the order of 1.75 trillion.

Question 1: Can the market provide capital of this size?

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→ The amount that the market will have to provide will be in the range of 700 billion to 1 trillion depending on how much the Government will provide. Raising this over the next five years from the market should not be a problem as there is sufficient time for banks to plan the time-table of their capital rising over this period.

Question 2: What will be the burden on the Government in capitalizing public sector banks (PSBs) and what are its options?

→ If the Government opts to maintain its shareholding at the current level, the burden of recapitalization will be around 900 billion and if it decides to reduce its shareholding in every bank to a minimum of 51%, the burden reduces to under 700 billion. It poses a challenge for the government given fiscal constraints. Government can issue recapitalization bonds against common equity infusion but this will be against fiscal transparency.

4th Question: Will Basel III hurt growth?

Answer: In India credit demand will expand rapidly than the GDP because:

- India will shift from services to manufactures, and the credit intensity of manufacturing is higher per unit of GDP than that for services.
- We need to double our investment in infrastructure which will place enormous demands on credit.
- Financial inclusion will bring millions of low income households into the formal financial system with almost all of them needing credit.

This means imposing higher capital requirements on banks at a time when credit demand is going to expand rapidly. Thus it depends on how much growth are we willing to sacrifice to

buy insurance against financial instability? Hence it's a tradeoff between short-term compulsions and long term growth prospects.

5th Question: How will Basel II affect the profitability of banks? Will it alter their incentive structure?

Answer: Implementation of Basel III is expected to result in a decline in Indian banks' **RoE** (Return on equity) in the short-term which has been approx 15% for the last 3 years. The expected benefits arising out of a more stable and stronger banking system will offset the negative impact of a lower **RoE** in the medium to long term.

Question 1: Will the banks bear the increased cost of capital themselves or pass it to their depositors and borrowers? The relatively higher level of net interest margins (NIMs) of Indian banks(approx 3%) suggests that there is scope for banks to improve their efficiency, bring down the cost of intermediation and ensure that returns are not overly compromised even as the cost of capital may increase.

Question 2: Will the mandate to maintain a higher quantum of liquid assets encourage banks to resort to lend to the Government, thereby crowding out credit to the private sector? This will resolve as the savings rate of the economy improves and the fiscal deficit comes down.

Given the competitive dimensions of our banking sector, the banks should be able to deliver efficient financial intermediation without compromising the interests of depositors and borrowers.

6th Question: Does India really need Basel III? Don't the costs outweigh the benefits?

Answer: According to Reserve Bank, India should transit to Basel III because of the following reasons:

1. As India integrates with the rest of the world and Indian banks go abroad and foreign banks come on to our shores, we cannot afford to have a regulatory deviation from global standards as it will hurt.
2. The deviation will hurt us in **perception** and **practice**
   Perception: The 'perception' of a lower standard regulatory regime will put Indian banks at a disadvantage in global competition because the implementation of Basel III is subject to a 'peer group' review.
   Practice: Basel III provides for improved risk management systems in banks to withstand shocks from external systems, especially as they deepen their links with the global financial system going forward.

The net additional burden of Basel III is lower than expected.

7th Question: The Reserve Bank has already rolled out the implementation of Basel III even as many countries are yet to do so. Why did you have to front run and why are some of your regulations more onerous than required under Basel III?

Answer:

- ✓ Start date – Not advanced (Agreed date Jan 1, 2013)
- ✓ End date – Advanced (from Dec 31, 2018 to March 31, 2018) - This if to align with Indian fiscal year. It was not extended to March 31, 2019 because of possibility of adverse notice.

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- ✓ Indian banks, unlike major global banks, do not engage in Basel Committee's consultative process.

Q: Why high capital is prescribed by Reserve Bank?

A: This is to address judgmental errors in capital adequacy like wrong application, misclassification of asset quality, etc. Basically, it is to address undercapitalization of risky exposures.

Q: Why high leverage ratio is prescribed by Reserve Bank (4.5% as against Basel III norm of 3%)?

A: This is a matter of supervisory comfort which the Reserve Bank does not want to dilute. However, the final leverage ratio requirement will be decided after final proposal of Basel Committee.

8th Question: What are the potential challenges in implementing the Countercyclical Capital Buffer?

Answer:

1. Identification of the inflexion point in an economic cycle will trigger the release of the buffer. Tightening too early or too late can be costly in macroeconomic terms. The identification of the inflexion point therefore needs to be based on objective and observable criteria.
2. Economic sectors such as real estate, housing, micro finance and consumer credits are relatively new in India, and banks have only recently begun financing them. The risk build up in such sectors cannot accurately be captured by the aggregate credit to GDP ratio.

9th Question: What are D-SIBs? Will any Indian Bank be

classified as a D-SIB?

Answer:

G-SIBs - Basel III seeks to mitigate the moral hazard relating to too-big-to-fail institutions by identifying global systemically important banks (G-SIBs) and mandating them to maintain a higher level of capital dependent on their level of systemic importance. Currently, no Indian bank appears in the list of G–SIBs.

D-SIBs - The Basel Committee is working on establishing a minimum set of principles for domestic systemically important banks (D-SIBs), and also on the norms for prescribing higher loss absorbency (HLA) capital standards for them.

10th Question: What sort of Capacity Building is required in the Implementation of Basel II, especially in the area of Risk management? What should banks do and what should Reserve Banks do in this regard?

Answer: There should be a radical change in banks' approach to risk management from Standardized Approaches of Basel II to the Advanced Approaches which will enable banks to manage their capital more efficiently and improve their profitability.

This requires three things:

1. Change in perception from looking upon the capital framework as a compliance function to seeing it as a necessary pre-requisite for keeping the bank sound, stable, and therefore profitable.
2. Deeper and broader based capacity in risk management.
3. Adequate and good quality data.

CONCLUSION

Effective implementation of **Basel III** is going to make Indian banks more strong, stable and sound so that they can deliver value to the real sectors of the economy.

CHAPTER – 4.2

FINANCIAL MANAGEMENT – PRUDENTIAL NORMS

The focus of the management of bank funds has shifted to **internal financial management** in the recent years. One element of this framework is the prudential accounting norms relating to investment portfolios.

Elements of prudential norms for investment portfolios of banks			
Investment policy	***Classification of investments***	***Valuation***	***Income recognition***
A suitable investment policy is needed to ensure that operations in securities are conducted in accordance with sound and acceptable	The entire investment portfolio should be classified under 3 categories: 1) Held to Maturity (HTM) 2) Available for sale (AFS) 3) Held for	Valuation should be done according to the three fold classification. **HTM** – Valued at the acquisition cost **AFS** – Marked to market **HFT** – Marked to market	Should be based on the record of the recovery and banks should not account for any income/interest on an NPA. The NPAs should be classified on the basis of the period for which they have remained NPAs.

business practices.	trading (HFT)	(MTM) but the book value doesn't change after MTM.	

The following are just *some of the many steps* that have been taken as prudential measures for better risk management:

- The credit exposure limit of capital funds of a bank to individual and group borrowers are 15 and 40 % respectively which should be raised by additional 5 and 10 percent.
- The foreign currency exposures of corporate sectors should be hedged.
- Comprehensive prudential norms relating to ceiling on total amount of real estate loans, etc should be framed by Board of Directors of banks.
- RBI has fixed limits on the exposure of banks to specific industry/sectors.
- Banks should formulate a transparent policy and procedure for investment and build adequate expertise in equity research.
- Equity shares in the portfolio of banks should be marked to market preferably on a daily basis, but at least once a week.
- Investment in the following instruments should not exceed by 10% of the capital funds of the investee bank – Equity shares, Subordinated debt instruments, Hybrid debt capital instruments, and any other instruments in the nature of the capital.
- Loans against shares, CBs, debentures, etc. to individuals

from the banking system should not exceed Rs 20 lakhs.

- The aggregate exposure to capital markets in all forms should not exceed 40% net worth of the bank including 20% as direct investment.
- A uniform margin of 50% should be applied on all advances on behalf of brokers and market makers. Within the 50% margin, a minimum cash margin of 25% should be maintained in respect of guarantees for capital market operation.

CHAPTER – 4.3

FINANCIAL MANAGEMENT – CAPITAL ADEQUACY NORMS

Capital adequacy norms -

1. Takes into account the element of risk in various types of assets in the balance sheet as well as the off-balance sheet business
2. Strengthens the capital base of the banks.

According to Basel II framework, revised capital adequacy norms were applicable to banks at both solo and consolidated levels.
The three mutually reinforcing pillars are -

A. Minimum Regulatory Capital Requirements based on Risk Weighted Assets (RWAs): Maintaining capital calculated through credit, market and operational risk areas.
B. Supervisory Review Process: Regulating tools and frameworks for dealing with peripheral risks that banks face.
C. Market Discipline: Increasing the disclosures that banks must provide to increase the transparency of banks

The main elements of the new capital adequacy framework are:

1) **Capital funds:** Capital funds are broadly classified as Tier 1 and Tier 2 capital. The elements of Tier 1 capital are paid up capital, statutory reserves and other disclosed free resources. The elements of Tier 2 capital are revaluation reserves, hybrid debt capital instruments, general provision and loan loss reserves, subordinated debt and innovative perpetual debt instruments.
2) **Capital charge for credit risks:** The main elements are securitization process, claims on domestic and foreign sovereigns, NPAs, claims on banks, PDs, corporate, off balance sheet items, claims secured by residential property and by commercial real estate, etc.
3) **External credit assessments:** The main elements are eligible CRAs (Credit Rating Agencies), scope of application of external ratings, mapping process, long term rating, short term ratings, use of multiple rating assessments, etc.
4) **Credit risk mitigation:** The important components of RBI guidelines are legal certainty, collateralized transactions, maturity mismatch, on balance sheet netting, etc
5) **Capital charge for market risk:** Market risk is the risk arising in on and off balance sheet positions because of changes in market prices. The main elements are interest rate risk in trading book, equities in the trading book, foreign exchange risks, and aggregation of capital charge for market risks.
6) **Market discipline:** The major elements are appropriate disclosures, accounting disclosures, frequency of

disclosures, proprietary and confidential information, risk exposure and assessment.

QUESTIONS

1. Explain the elements of prudential and the capital adequacy norms of financial management framework.
2. What are the three mutual reinforcing pillars of Basel norms? How is Basel III an improvement over Basel II?
3. How does D. Subbarao answer the major concerns of Basel III norms with respect to growth, profitability of banks, complying with new liquidity standards and raising additional capital? Do the costs outweigh the benefits?
4. Is the view that the risk sensitive framework of Basel II caused the crisis valid? Is Basel III really required?

TOPIC – 5

CHAPTER – 5.1

RBI's BALANCE SHEET

Features of RBI's Balance Sheet

- ✓ The Reserve Bank of India Act, 1934 (RBI Act) provides that the Bank shall prepare separately a weekly account of the **Issue Department** and of the **Banking Department** in the forms prescribed by the Central Government.

- ✓ While Balance Sheets for the Issue and Banking Departments have been kept separate, only one Profit and Loss Account is prepared for the entire bank.

- ✓ As per the RBI Act, the only liability of the Issue Department is 'Notes in Circulation'. The assets of the Issue Department comprise broadly, gold coins and bullion, rupee coins, rupee securities and foreign securities.

Liability	Asset
1	2
Notes held in the Banking Department	Gold Coin and Bullion (a) Held in India (b) Held outside India
Notes in circulation	Foreign Securities Rupee Coin Government of India Rupee Securities Internal Bills of Exchange and other Commercial Paper
Total Liabilities (= Total Notes issued)	Total Assets

ISSUE DEPARTMENT of RBI's BALANCE SHEET

- ✓ The Banking Department balance sheet is made up of assets and liabilities arising from the banking business of the RBI. The first liability is the Paid up Capital followed by Reserve Fund. National Industrial Credit and National Housing Credit Funds are also included. Deposits come to the RBI from three broad sources - Government, banks and others. Bills payable are transitory operational liabilities in respect of outstanding drafts, pay order, etc. Other liability is a residual head. However, it contains the Balance Sheet's most important items - the reserves and provisions. The three reserves included are Contingency Reserve (CR), Exchange Fluctuation Reserve (EFR) and Exchange Equalization Account (EEA).

Liability	Asset
1	2
Capital paid-up	Notes
	Rupee Coin
Reserve Fund	Small Coin
	Bills Purchased and Discounted:
	(a) Internal
	(b) External
	(c) Government Treasury Bills
National Industrial Credit (Long Term Operations) Fund	Balances Held Abroad
National Housing Credit (Long Term Operations) Fund	Investments
Deposits	Loans and Advances to:
(a) Government	(i) Central Government
(i) Central Government	(ii) State Governments
(ii) State Governments	Loans and Advances to:
(b) Banks	(i) Scheduled Commercial Banks
(i) Scheduled Commercial Banks	(ii) Scheduled State Co-operative Banks
(ii) Scheduled State Co-operative Banks	(iii) Other Scheduled Co-operative Banks
(iii) Other Scheduled Co-operative Banks	(iv) Non-Scheduled State Co-operative Banks
(iv) Non-scheduled State Co-operative Banks	(vi) Others
(v) Other Banks	Loans, Advances and Investments from National Industrial Credit (Long Term Operations) Fund
(c) Others	(a) Loans and Advances to:
Bills Payable	(i) Industrial Development Bank of India
Other Liabilities	(ii) Export Import Bank of India
	(iii) Industrial Investment Bank of India Ltd.
	(iv) Others
	(b) Investments in bonds/debentures issued by
	(i) Industrial Development Bank of India
	(ii) Export Import Bank of India
	(iii) Industrial Investment Bank of India Ltd.
	(iv) Others
	Loans, Advances and Investments from National Housing Credit (Long Term Operations) Fund
	(a) Loans and Advances to National Housing Bank
	(b) Investments in bonds/debentures issued by National Housing Bank
	Other Assets
Total Liabilities	Total Assets

BANKING DEPARTMENT of RBI's BALANCE SHEET

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- ✓ The assets of the Banking Department appear in an ascending order of liquidity. The first three assets viz., notes, rupee coin and small coin are cash balances held in the Banking Department. Bills purchased and discounted can be Government Treasury Bills and commercial trade bills, both domestic and external, purchased or discounted from commercial banks and State Governments. Balances Held Abroad are foreign currency balances maintained with foreign central banks and international financial entities. Investments include investments in Government of India securities, foreign securities, shares in subsidiaries and associate institutions. The next category of assets consists of loans and advances. Other asset is the residual group.
- ✓ Income is shown as a single entry on the income side of the Profit and Loss Account. The main sources of income are interest on domestic foreign securities and foreign deposits; discount and rediscount charges; and commission on management of public debt. The largest proportion of expenditure is by way of interest payment, mainly on account of interest on Cash Reserve Ratio (CRR).

Analytical Approaches to Analyzing the Reserve Bank Balance Sheet

The Reserve Bank traditionally followed the **balance sheet approach** (also known as the structural or credit counterparts approach) of examining the variations in money stock. A focused analysis of the Reserve Bank Balance Sheet began with the Reserve Bank's first Working Group on Money Supply (1961)

which introduced a parallel construct of the monetary base, called 'government money' for forecasting money supply.

The **monetary and targeting framework**, recommended by the Committee to Review the Working of the monetary system transformed monetary analysis at the Reserve Bank by embracing the very same **money multiplier approach**, given the reasonable degree of association between reserve money and money supply.

A third paradigm of monetary policy links the movements in the central bank balance sheet to the determination of interest rates through bank reserves.

RBI satisfies the Code on Transparency of Monetary and Financial Policies framed by the International Monetary Fund (IMF), in terms of the following three criteria

A. Releasing data in consonance with the IMF's SDDS standards,
B. Disclosing balance sheet on a pre-announced schedule
C. After a pre-determined interval, disseminating selected information on its aggregate market transactions.

CHAPTER – 5.2

FUNCTIONS AND ROLE OF RBI

Money Market – Definition

Money market is a market for overnight to short term funds (i.e. up to 1 year) and for short term money and financial assets that are close substitutes for money, that is, financial assets that can

be quickly converted into cash (money) with minimum transaction cost and without loss in value.

Functions of Money Market

- Equilibrating mechanism for evening out short term surpluses and deficiencies in the financial system.
- Focal point of Central bank's intervention for influencing liquidity in the economy.
- A reasonable access to the users of short term funds to meet their requirements at realistic prices.

Operational features of the money market (in contrast to capital market)

- Short duration
- Institutional sources of working capital financing
- Large number of participants
- Wholesale market
- Same day settlement of transactions
- Scope for innovative dealings
- Large number of inter-related sub markets

RESERVE BANK OF INDIA	
FUNCTIONS	**ROLES**
1. Maintain monetary stability	1. Authority to issue Notes
2. Maintain financial stability and ensure sound financial institutions	2. Banker to the Government
3. Maintain stable payments system so that financial transactions can be safely	3. Bankers' Bank

executed	
4. Promote the development of the financial infrastructure, playing a leading role in developing sound financial system	4. Exchange Control Authority
5. Ensure that credit allocation by the financial system broadly reflects national economic priorities and societal concerns	5. Supervisory Authority/Regulator and Supervisor
6. Regulate the overall volume of money and credit in the economy, ensuring price stability	6. Promotional Role
	7. Regulator of Money and Credit/Monetary Authority

Roles of RBI

1. Authority to issue Notes – RBI has the sole right to issue bank notes of all denominations. The distribution of one rupee notes and coins and small coins all over the country is undertaken by RBI as agent of the Government. RBI has a separate Issue Department which is entrusted with the issue of currency notes.

2. Banker to the Government – RBI has the obligation to transact Government business to keep the cash balances as deposits free of interest, to receive and to make payments on behalf of the Government and to carry out

their exchange remittances and other banking operations. RBI helps the Government to float new loans and to manage public debt. It makes ways and means advances (WAMA) to the Governments for 90 days. It makes loans and advances to the States and local authorities. It acts as adviser to the Government on all monetary and banking matters.

3. Bankers' Bank – The scheduled banks can borrow from RBI on the basis of eligible securities or get financial accommodation in times of need or stringency. Since commercial banks can always expect RBI to come to their help in times of crisis, the Reserve Bank becomes not only the banker's bank but also the **lender of the last resort**.

4. Exchange Control Authority - RBI manages to reach the goals of the Foreign Exchange Management Act (FEMA), 1999. The objective is to facilitate external trade and payment and promote orderly development and maintenance of foreign exchange market in India.

5. Supervisory Authority/Regulator and Supervisor – RBI has non-monetary functions of the nature of supervision of banks and promotion of sound banking in India. RBI has wide powers of supervision and control over commercial and co-operative banks, relating to licensing and establishments, branch expansion, liquidity of their assets, management and methods of working,

amalgamation, reconstruction, and liquidation. It can carry out periodical inspections of the banks.

6. Promotional Role – RBI performs a variety of developmental and promotional functions like promoting banking habit, extending banking facilities to rural and semi-urban areas, and establishing and promoting new specialized financing agencies. Institutions like IFCI, SFC, IDBI, SIICs, IIBI, NABARD, UTI, etc have been set up for the same.

7. Regulator of Money and Credit/Monetary Authority – RBI uses the following techniques to maintain price stability and ensure adequate flow of credit.

(a) Open Market Operations (OMOs)

It refers to sale and purchase of securities.

Objectives of OMOs are:

- Control the amount of and changes in bank credit and money supply
- Make the bank rate policy more effective
- Maintain stability in the government securities market
- Support the government's borrowing programme
- Smoothen the seasonal flow of funds in the bank credit market

No restriction on quantity/maturity of government securities which RBI can buy/sell.

OMOs have indirectly helped in the regulation of the supply of bank credit in 2 ways:

- When conducted for switching operations, they lengthen the maturity structure of government securities which has a favourable impact on monetary policy
- Net sales of government securities have increased over the years, which have helped in regulating the flow of bank credit to private sector.

(b) Bank Rate (B/R)

It is the standard rate at which RBI buys/rediscounts bills of exchange/CPs.

It is also the rate that the RBI charges on advances on specified collaterals to banks.

Increase in Bank rate → Decrease in Volume of Credit

Decrease in Bank rate → Increase in Volume of Credit

(c) Refinance

This is used by RBI to relieve liquidity shortages in the system, control monetary and credit conditions and direct credit to selective sectors.

Refinance rate is now linked to the bank rate and there are two refinance schemes available – export credit refinance and general refinance.

(d) Cash Reserve Ratio (CRR)

RBI prescribes the CRR without any floor/ceiling rate as a percentage of demand/time liabilities. This is the percentage of demand/time liabilities that the

commercial banks have to keep with RBI as reserves. RBI doesn't pay any interest on CRR balances.

(e) Statutory Liquidity Ratio (SLR)

SLR is the ratio of cash in hand, balances in current account, gold and other approved securities to the total demand and time liabilities of the banks.

It allows RBI to impose secondary and supplementary reserve requirements on the banking system. Objectives are:

- Restrict the expansion of bank credit
- Augment a bank's investment in Government securities
- Ensure solvency of banks

Increase in SLR → Restrict the private sector expenditure, increase the public sector expenditure

Decrease in SLR → Restrict the public sector expenditure, increase the private sector expenditure

(f) Liquidity Adjustment Facility (LAF)

LAF is used to aid banks in adjusting the day to day mismatches in liquidity.LAF consists of repo and reverse repo operations. Repo or repurchase option is a collateralized lending i.e. banks borrow money from Reserve bank of India to meet short term needs by selling securities to RBI with an agreement to repurchase the same at predetermined rate and date.

In April 1999, an interim LAF was introduced to provide a ceiling and the fixed rate repos were continued to

provide a floor for money market rates. As per the policy measures announced in 2000, the Liquidity Adjustment Facility was introduced with the first stage starting from June 2000 onwards. Subsequent revisions were made in 2001 and 2004.

Merits of LAF –

- It is a flexible instrument with RBI to modulate, even out and manage short term market liquidity fluctuations on a daily basis
- They help the banking system also by providing it with an outlet for short term liquidity and optimize return on short term surplus funds
- It provides liquidity and breadth to the treasury securities market
- It helps to transmit short term interest rate signals to other money markets, financial markets and long end of the yield curve.

(g) Repos/Reverse Repos

A repo is a transaction in which the two parties agree to sell and repurchase the same security. The seller sells with an agreement to repurchase later. The same transaction is repo from the viewpoint of seller and is reverse repo from the viewpoint of buyer.

These are used to:

- Meet a shortfall in cash position
- Increase returns on funds held
- Borrow securities to meet regulatory (SLR) requirements

- Adjust liquidity in the financial system under the LAF

There are 2 types of repo auctions – discretionary price repo auctions and fixed rate repo/uniform price auctions. In the former, cut off repo rates are announced after the submission of bids, while in the later, repo rates are pre-announced.

There are 2 types of repos in India – Inter-Bank Repos and RBI Repos.

- RBI undertakes repo/reverse repo with banks and PDs as part of its OMOs to absorb/inject liquidity.
- RBI conducts repo auctions to provide banks with an outlet for managing short –term liquidity.

First leg of Repo: Borrower sells the security to the lender

Total consideration = Deal rate * Face Value + Accrued Interest

Second leg of Repo: Borrower repurchases the security from the lender

Reversal price = Deal rate * Face Value + (Interest for holding period – Interest paid at repo rate)/Face Value

Total consideration = Reversal Price * Face Value + Accrued Interest

(h) Market Stabilization Scheme (MSS)

RBI initiated the issuance of dated government securities with less than two years maturity and T-bills under MSS in 2004. The main purpose was –

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- To absorb surplus liquidity of a more enduring nature
- To reduce the burden of stabilization on the LAF window.

The interest payment is the liability of the government. MSS helps in

- Maintaining stability in forex market
- Improving liquidity management
- Conducting monetary policy in accordance with LAF/OMOs
- Stabilization of short term money market rates
- Enabling affecting demand for funds and modulate their supply on a daily basis to meet day to day mismatches.

CHAPTER – 5.3

IMPOSSIBLE TRINITY

The various reforms in early 1990s which have provided greater flexibility in the conduct and operations of monetary policy are:

- Fiscal dominance has given way to monetary-fiscal coordination
- Statutory pre-emptions have seen significant reduction
- Interest rates have been deregulated, although still not fully
- Financial markets have seen progressive deepening
- Tightly controlled and regulated economy to one benefitting from a growing degree of deregulation and liberalization, both domestic and external.

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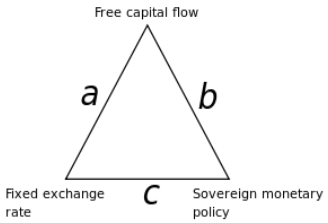
- The external sector has witnessed significant liberalization
- The current account became convertible in 1994 and the exchange rate has been largely market-determined since March 1993.
- The capital account has been progressively liberalized in terms of inflows as well as outflows.
- Monetary policy signals are now largely transmitted through changes in policy rates.

With this come new challenges of volatile capital flows. Large capital inflows are associated with credit and investment booms, inflation, overheating, real exchange rate misalignments, current account imbalances and financial sector weaknesses culminating in financial crisis.

Reversals of capital flows to the EMEs are quick, necessitating a painful adjustment in bank credit, collapse of asset prices, compression of domestic demand and output losses. Thus, the boom and bust pattern of capital inflows can result in large employment and output losses, and macroeconomic and financial instability. However India has managed the capital flows quite well and ensured high growth and financial stability.



Impossible Trinity

One of the most important results in macroeconomics, by Mundell and Fleming, is that a country cannot simultaneously have all three:

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1) Open financial markets (Free Capital Mobility)
2) Fixed exchange rates (Peg)
3) Effective monetary policy (Monetary Autonomy)

Any country can choose two of these three. ***The Impossible Trinity*** is also sometimes called the "*Trilemma*" since it is a choice among three favourable options, only two of which are possible at the same time.

A country can fix its exchange rate without weakening its central bank, but only by maintaining controls on capital flows (like China today); it can leave capital movement free but retain monetary autonomy, but only by letting the exchange rate fluctuate (like Britain or Canada); or it can choose to leave capital free and stabilize the currency, but only by abandoning any ability to adjust interest rates to fight inflation or recession (like the currency board regimes in Hong Kong today)

What have most EMEs done?
They have adopted middle solutions rather than hard corners, for example – There can be managed capital account and managed but flexible exchange rate with sovereign monetary policy.

Why do EMEs suffer?
EMEs have strong fundamentals but still they suffer. This is because surges in capital flows are the result of monetary policy stance in advanced economies and low interest rates in advanced economies encourage outflows from these economies into EMEs in search of yields. Thus, interest rate cycles can

generate cycles in capital flows to the EMEs which needs to be managed for ensuring financial stability.

Capital inflows and outflows have greater impact on daily exchange rate movements and expectations relative to net flows. Large volatility in capital flows has an impact on domestic monetary and liquidity conditions in the EMEs.

Exchange Rate Volatility

Impact on exchange rate is one way in which capital flows can affect adversely. Exchange rate volatility has significant employment, output and distributional consequences. For the advanced countries, specializing in technology intensive products, the degree of exchange rate pass through is low. On the other hand, the developing countries and EMEs specializing in labour-intensive products are vulnerable to pricing power by large retail chains.

Given this, how should central banks/ monetary policy react to exchange rates?

Conventional view - Respond to inflation and real GDP and not to exchange rate movements.

This is based on assumption of perfect capital mobility between countries, interdependence of foreign exchange markets, price links between different countries, as well as export and import flows and the current account. For EMEs, conventional view is not appropriate.

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Trade deficits should lead to currency depreciation?

A simple analysis of current account balance and exchange rates for a sample of 36 countries indicates that current account deficits are associated with both nominal and real appreciation. With open capital accounts and rapid movement of capital flows it is these flows that dominate the effect of current account deficits and drive exchange rate dynamics. Lags lead to crisis.

To ensure real exchange rate misalignments do not persist for long periods, there should be active capital account management, intervention and sterilization, along with continuous strengthening of financial sector.

Since capital flows are much more volatile than current account developments, subject to herd behaviour leading to excess flows and sudden stops, EMEs have had to resort to some degree of capital account management and associated forex interventions influencing movements in the exchange rate.

India has also avoided corner solutions in exchange rate and capital account management while practicing an independent monetary policy.

CHAPTER – 5.4

MONETARY POLICY – TARGETS AND INSTRUMENTS

Monetary policy actions are the actions to change the money supply.

Operating Procedure - A combination of intermediate targets and procedures for using policy instruments to achieve targets.

Sometimes there is an additional link- operating procedure that lies between instruments and intermediate target. It makes achieving intermediate target easier. E.g. short run interest rates, borrowed/ non-borrowed reserves.

Monetary Policy (FINAL) GOALS/ TARGETS

Goals can be for the economy as whole, known as macroeconomic goals as well as for the financial sector which are microeconomic in nature.

There are 4 categories of macroeconomic goals:

1. **Economic growth**- It can be measured as the real GDP growth rate, real personal income etc. Since the Federal Reserve System as well as the government benefits from a growing economy they want to stimulate growth.
2. **Price stability**- It can be measured by the stability of inflation rate and by amount by which it exceeds target level. Price stability refers to both
   - Low inflation rate
   - Stable inflation rate

3. **Stabilization of business cycle (Countercyclical policy)-** The FED wants to counteract the effects of the business cycle specially the rise in unemployment and fall in output during recessions for which it uses countercyclical policy.
4. **All other goals**- e.g. interest rate stability (desirable for financial sector stability) or exchange rate stability (desirable to stabilize trade balances, also financial market stability).

Monetary Policy INSTRUMENTS

These are the tools the central bank can use to achieve its targets, and it depends on its institutional setup.

There are majorly four instruments:

1. **Open market operations (OMO's)** - OMO's are the sale and purchase of government securities by the Fed. An open market purchase is when the Fed buys government securities from the people thus increasing the monetary base (currency held by public + bank reserves). A sale is the opposite and leads to monetary base contraction. This is the instrument most often used by the Fed to exert close control the monetary base.
2. **The discount rate** - It is the interest rate the Fed charges commercial banks and other depository institutions to allow them to borrow directly from the Fed. Fed regulates both the quantity that can be borrowed and the interest rate. A higher discount rate => reduced discount borrowings, the more expensive it is to borrow reserves, higher the excess reserves banks will keep, lowering the money multiplier and thus money supply.
   It is an ancillary tool, i.e. added but not essential.

3. **The required reserve ratio (rrr)** - It is the proportion of the deposits which banks have to keep as reserves. Higher rrr => lower monetary base and vice versa. Rrr is a very powerful tool but imprecise because small changes in it can lead to very large changes in the multiplier and money supply and also on the profitability and stability of financial sector. Thus they are rarely used.
4. **Selective credit controls** - This can take the form of price floors/ ceilings on interest rates in selected financial sectors or quantity restrictions in selected markets. E.g. regulation Q (ceiling on interest paid on deposits), usury laws (ceiling on the interest paid on loans), margin requirements (quantity restrictions).

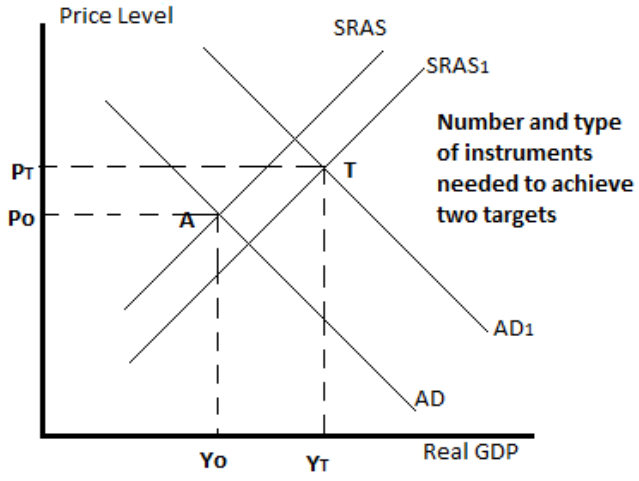
   This instrument is also rarely used though it has potential to have large short term impacts.

The number of independent instruments and targets

Jan Tinbergen "*to achieve certain number of targets requires at least the same number of instruments as targets*". If the targets are distinct the instruments must exert distinct influences on them.

To see this, consider the usual SRAS (short run AS)-AD analysis. The AD and SRAS curves intersect at A, giving price level P_0 and output level Y_0. Suppose the government targets a price level of P_T and output level of Y_T as shown in the diagram. To reach to this point we need to shift both AS as well as AD curve rightward. The new intersection is at T corresponding to P_T and Y_T. However for this Fed should be able to control both the AS and the AD curve i.e. if it needs to achieve two targets it needs two

instruments, one that effects AS and the other that effects AD. However in reality although it has more than two instruments at its disposal but all of them effect only AD. It has no instrument that can alter AS.



As a result it can be seen that the Fed cannot achieve both the targets, no shift in AD curve alone can move the economy from A to point T. If AD is shifted to AD_3, P_T is achieved and if it is shifted to AD_2 Y_T is achieved. By choosing something like AD_2, the Fed moves closer to target T though doesn't achieve any.

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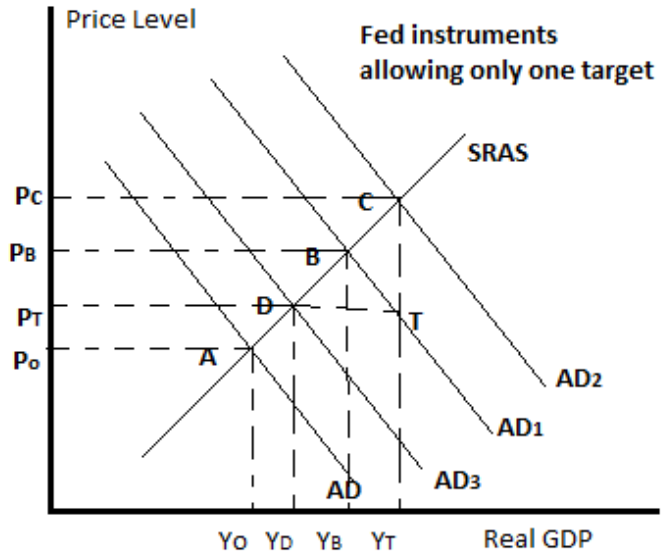

It is the inability of the Fed to change SRAS that it has to choose between the targets.

The above example shows that why not only number of instruments but the number of instruments exerting independent effects on the target variables is important.

Link between MONEY and POLICY targets

Effects of changing money supply in

I. **The LONG RUN** (vertical AS curve)

An increase in the money supply shifts the AD curve to the right and reduction to the left. Given a vertical AS we can see that the output level is fixed at Y_0, it can change until AS shifts and as seen earlier Fed has no control over AS. Thus

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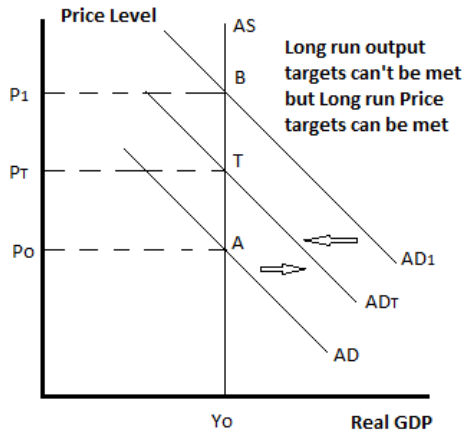
output targets cannot be achieved in the long run, such a target is quixotic (impractical)



As far as price targets are concerned, they can be achieved by desirable shifting of the AD curve by changing money supply. A higher target level can be achieved by increasing money supply thus rightward shift of the AD curve and vice versa for lower price target level. **Price level stability is the overriding long run goal** of monetary policy.

II. **The SHORT RUN** (upward sloping AS curve)

This analysis is similar to what we described in the previous section where we studied that equal number of independent instruments are needed to achieve targets. We saw above that there is a trade-off between achieving price targets and output targets the **Fed can achieve either of the two**.

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An important point to be taken care of is that the **AS cannot be considered fixed here**. The position of SRAS is influenced by the fact that input prices are held constant and these prices are largely determined by expectations. Suppose the workers expect the Fed to raise price level to achieve higher output level i.e. increase in money supply is expected, then they know this would reduce their real wages, thus they demand higher nominal wages today. This would lead to a leftward shift of AS countering some or all of the impact of monetary policy. Thus Fed must be concerned about the shifts in AS even in the short run.

Monetary policy INTERMEDIATE TARGETS

These are the targets that the Fed tries to achieve because doing so would help it achieve the final targets.

The reasons why Fed adopts intermediate targets are:

(a) To make **discussions of monetary policy less of political and ideological contests**. It is easier and less controversial to talk about what should be the money supply growth rate (which is an intermediate target) compared to what should be the unemployment rate or output growth rate etc.

(b) There is **timely information available for intermediate targets** which help judge Fed's success or failure in achieving the targets. Intermediate targets are observed frequently like interest rates, money supply compared to GDP growth rates, CPI etc.

Properties a **good intermediate target** should possess

(a) Consistent with the final goal/ target of the monetary policy

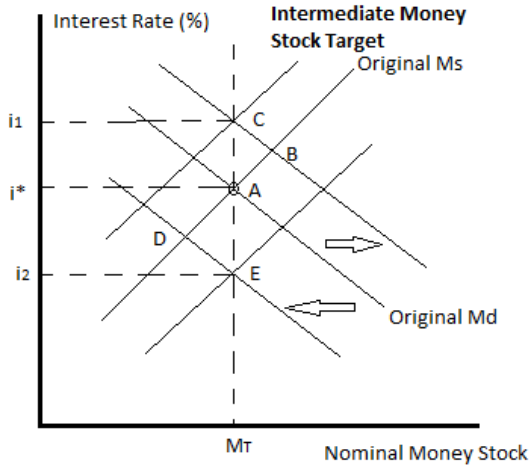
(b) Accurately measurable on a timely basis

(c) Controllable so that the Fed can hope to achieve it

Different intermediate targets:

I. Money Aggregate

To target something like inflation rate or even GDP growth rate, Fed can use money aggregate as an intermediate target (via the quantity theory of money equation). It manipulates its instruments to keep money supply (MS) at the target level. If money demand rises, it leads to an increase in the equilibrium MS level then Fed reduces money supply such that the new equilibrium level is achieved at the MS target level. Although it achieves the target MS level but by doing so it leads to an increase in interest rate.



If Fed chooses an intermediate money target, there will be greater interest rate variability.

Case for	Case against
It allows interest rates to rise in response to shifts in investment demand/consumption demand (C) not caused by interest rate movements, thus reducing fluctuations in AD from those causes. Suppose C decreases due to increased thriftiness, then AD shifts to the left reducing P and Y. Y reduces money demand. Money supply is reduced to achieve target level MS thus i reduces. A reduction in i ensures an increase in I & C thus countering the initial decrease in C. The more volatile the components of AD are, stronger is the case for money target.	By trying to achieve money target, interest rate stability has to be given up. Interest rate variability affects investment and consumption.
It is less likely to become a topic of political conflict or controversy.	There is considerable debate as to which out of M1, M2, M3 should be used as the target.
It can be achieved even in the long run.	

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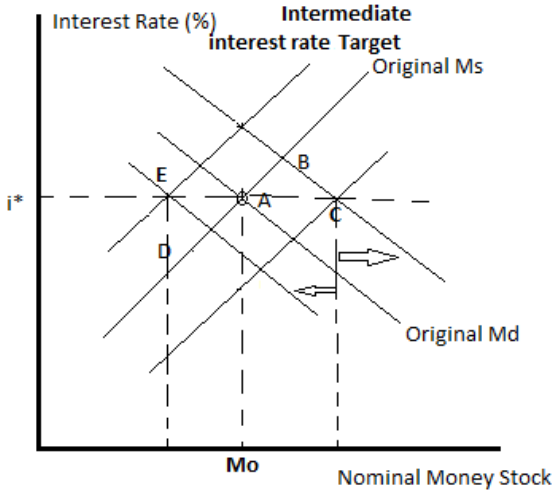
II. Interest Rate

Here the Fed manipulates its instruments to achieve a targeted level of interest rate. If money demand increases, Fed increases the money supply so that interest rates do not change.

Thus



intermediate interest rate target is maintained at the cost of an increase in money supply. Money supply control is lost in the short run, however in the long run **i** can be adjusted to achieve expected money stock level of Mo level.

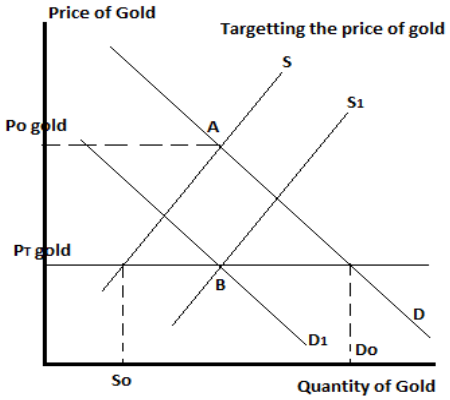
Case for	**Case against**
Stability in the interest rate ensures stability of AD components like investment and consumption demand.	Interest rate targets become final targets because they directly affect voters. Such targets are highly controversial.
It also reduces the impact of	If C and I change due to

money demand changes on P and Y because as money demand changes, i would change so AD would shift but now **i** doesn't change and is maintained at the targeted level. The more volatile the money demand, stronger is the case for interest rate target.	reasons other than i changes then interest rate target exacerbates the effect. Suppose C reduces due to thriftiness, then Y reduces so money demand reduces as a result interest should fall but since it is targeted, money supply would be reduced so that **i** increase to the targeted level. An increase in **i** would further reduce C and I. (pro-cyclical)
	These targets cannot be maintained indefinitely because real interest rates are determined by real factors in the long run (Fisher's Equation).

III. Commodity Price Target

The underlying idea is that by targeting a price index (either one commodity or group of commodities) the Fed will better maintain a low and stable inflation rate. The Fed would use the instruments in its control to adjust the money supply to offset deviations of the commodity price from target. Suppose Fed targets price of gold, then if the price is above target price, there is excess demand at target price so Fed ends up selling gold to public.

In doing so it accumulates domestic currency, reducing currency in circulation thus reducing money supply. This leads to a decline in overall price level.



This decline in price level shifts the demand curve of gold to the left and the supply of gold to the right i.e. demanders demand less and suppliers supply more at any given price level. This eventually reduces the amount of gold public buys from the Fed to zero.

Case for	**Case against**
Larger group of commodities can be used to form an index that can then be targeted. In this case, money supply would not have to respond to shocks in any single commodity.	Any change in the demand or supply of the commodity would change its price thus change money supply and general price level.
	The link between the commodity price targeted and final targets, price level or GDP is poorly understood.

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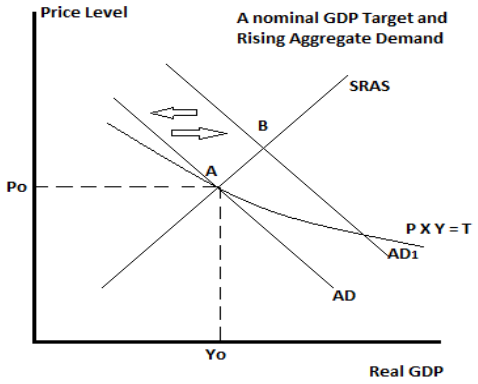
IV. Nominal GDP target

The underlying idea here is that Fed should maintain money supply level to keep nominal GDP at a targeted level provided velocity is constant- it is based on the equation MV=PY.

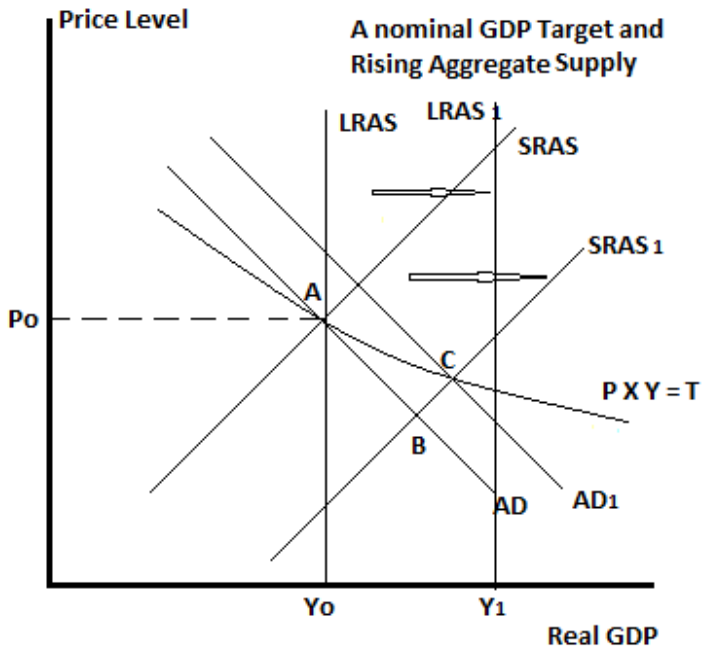
Case for	Case against
Implicitly promote price stability. g(nominal GDP)=g(real GDP)+ inflation Given g(real GDP) indirectly by targeting g(nominal GDP) inflation is stabilized.	It is difficult to control nominal GDP; changes in money supply do not immediately show up as changes in nominal GDP.
Provides built in stabilization against changes in AS.	Timely information not available.
Encourages quicker short run adjustments towards long run level of real output.	

Built in stabilization

The nominal GDP target is the curve **P*Y = T** i.e. Fed targets to keep the economy somewhere on this curve. Suppose initially



equilibrium is at A, intersection of SRAS and AD and this lies on curve T. Now if AD increases to AD_1 equilibrium shifts to B. To reach the target level T Fed reduces money supply so that AD shifts back. Now if SRAS shifts to the right equilibrium shifts to B, lower P and higher Y. Now Fed increase money supply to reach point C. Thus it achieves a higher Y and a lower fall in price than would have been if AD didn't shift. This also moves the economy closer to the long run equilibrium which will be at a higher Y level.



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Problems in Monetary Policymaking

1. **LAGS** - There exist lags between the occurrence of an event that brings forth a policy response and the eventual response of the economy. These can be of two types:

(a) **Implementation lags**- The lag between the time a policy action is needed and the time the action occurs.
These can further be subdivided:
   (i) Information lags - Lags in availability of information that helps to determine the state of the economy.
   To be able to take appropriate policy action, information about the economy should be available. Lack of awareness lead to implementation lags. Data regarding prices, unemployment, real GDP are not regularly available; these are either monthly or quarterly data so information is not available on a daily basis.
   (ii) Recognition lags - Lags in the recognition that a policy action is needed based on information available. Since all data is not available at the same time it leads to recognition lags. Sometimes data gives conflicting messages about the state of the economy – unemployment constant but industrial production decreased- thus output situation is uncertain.
   (iii) Legislative lags - Lags in the enactment of the appropriate legislation needed for a policy. However this is not a major issue with monetary policy, it mostly important in case of fiscal policy.

(b) Effectiveness lags- The lag between when a policy action is taken and when the action results in changes in the

economy. More often than not, monetary policy actions do not show results immediately, rather they take some time and these make up the effectiveness lags.

One solution to this problem of effectiveness lags can be forecasting where the economy would be one year from now so that actions can be taken today which will deliver results one year from now when they are actually needed. It should be noted however that these forecasts are not very accurate.

2. **INSTRUMENT INSTABILITY** - It can arise when a change in the instrument affects the targeted variable over a number of future periods. Suppose money supply increase prices but not immediately. If Fed undertakes an open market purchase today it will have full impact on prices say in 12 months. The Fed wants a certain level of price level 3 months from now and changes money supply accordingly. Price target is achieved but the money supply change will keep on having an impact on the prices and thus take it away from the target. To counter this effect Fed will have to undertake a counter action. This means Fed will have to tolerate ever larger changes in the instrument to hold the target.

   There are two solutions for this: The Fed should aim to control the intermediate target over a longer period of time or/ and try to target a forecasted level (difficult as forecasts are generally not accurate).

3. **INACCURATE MACROECONOMIC MODEL** - The macroeconomic models that policy makers work with are

imperfect and thus the policy action that might look good with respect to one model may not be a good option according to another. Thus policy makers move gradually checking the impact of their actions.

4. **CONFLICTIONG GOALS** - As we have studied earlier in the chapter there exists trade-offs, between higher output and lower price, stable interest rates or money supply etc. Thus we can see goals can be confliction. Also as administrations change goals also change.

5. **CONFLICT AMONG POLICYMAKERS** - There can exist conflicts among policymakers- fiscal or monetary- they can choose conflicting goals. The monetary authority may have a price target and fiscal authority an output target. Thus in case of increasing AS both will want opposite effects on AD.

Reference - N.Jadhav

Money Targeting - When the demand for money is entirely driven by transactions demand then interest rate sensitivity is negligible and velocity of money is stable, thus money target which is consistent with output can be targeted. The equation used is: $\frac{\partial M}{M} = \frac{\partial Y}{Y} + \frac{\partial P}{P}$

History: In the 1970's countries adopted money targeting but with financial innovation the stability of money demand began to get affected- a given stock of money was capable of serving larger volume of transactions. This was a problem faced by

developed nations some of which shifted to interest rate targeting.

In the emerging markets however, money was still targeted because of lack of developed markets which was a pre-requisite of interest targeting. But gradually with instability of money demand some of them shifted to inflation targeting.

Credit Targeting - Credit was targeted to analyze the impact of monetary policy on aggregate demand. It was seen that credit volumes could differ at same interest rates because of changing macroeconomic circumstances, banks might ration credit among borrowers at a block price because they cannot evaluate each project individually.

Exchange Rates - Simplest example of this is the fixed exchange rate regime, however as seen in the light of the impossible trinity this hasn't worked well. Thus Central banks now keep an informal band compatible with their macroeconomic overview.

Also as an experiment (not successful though) monetary conditions indices = weighted average of interest rates and exchange rate (weights being a measure of the openness of economy) have also been targeted.

Inflation Targeting - The primary advantage here is the transparency (explicit inflation targeting). This is based on 5 pillars:

- Institutional commitment to price stability
- Absence of other nominal anchors

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- Absence of fiscal dominance
- Policy instrument independence
- Policy credibility and transparency

Most economies targeting inflation follow flexible rather than strict inflation targeting taking into account deviations of output from potential.

In the emerging economies the record of inflation targeting is weaker partly because of low credibility of monetary authority and partly because of sharper trade-offs.

Multiple Indicator Approach

In the absence of a clear correlation of intermediate targets with the final objectives, RBI has turned to multiple indicator approach or the check list approach. Though a single intermediate target is theoretically more appealing and operationally easier, but to find that one variable which would encapsulate the larger number of factors which need to go into monetary policy is a difficult task. With financial liberalization, channels of monetary policy shift course thus RBI has to operate through all the paths that transmit its policy impulses to the real economy.

However even this list (indicators) isn't comprehensive because of lack of data- wages, employment and more importantly the definition of employment for such a populous country. The only directly visible variable in the list from AS side is input cost. Thus it is broadly driven by estimates about AD without enough information about AS.

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Operating Procedures

With liberalization RBI had to shift from direct instruments of control to indirect instruments due to which operating procedures changed drastically. RBI now uses a mix of policy instruments including changes in reserve requirements, standing facilities, open market operations and changes in policy rates.

Challenges of financial liberalization

1. 1990's we faced BOP crisis, which necessitated swift monetary policy action in terms of import compression and demand containment.
2. Capital began to flow in with liberalization – RBI had to absorb foreign currency to maintain competitiveness of the economy and also had to sterilize the surplus liquidity to rein inflation. This was the time when OMO's were introduced.
3. To contain monetary expansion, reserve requirements had to be raised.

Gradually as the markets became more stable, inflation was controlled the policies were eased and RBI was able to influence short term interest rates.

Challenges of transition

1. RBI's ability to target growth of monetary base in line with monetary projections was restricted by the liquidity impact on the interest rates. This was because of the simultaneous operation of multiple channels of monetary policy transmission both quantum as well as rate.
2. RBI's scope for defending a certain level of interest rates is also curtailed by the monetary impact of its operations in the money and government securities market.

In the Indian context the otherwise difficult management of diverse channels of monetary policy transmission has been reasonably easy because:

1. Strong capital flows at the time of weak credit demand enabled RBI to trade surplus on external account with the government deficit thus easing interest rates without enlarging money supply.
2. Reductions in interest rates have tended to respond to the easing of structural constraints such as cuts in reserve requirements etc.

The Fiscal Constraint

Dilemmas in monetary policy exist due to conflicts between monetary management and the internal debt management functions of the RBI. In the recent years the fiscal constraint on monetary policy has eased. The ad hocs were abolished in 1997 thus doing away with automatic monetization of government debt under the Fiscal Responsibility and Budget management Act which gave greater autonomy to RBI.

Efficacy of Instruments

A major challenge faced by RBI is the relative effectiveness of the various policy instruments at the disposal of RBI.

Issues here are:

(a) Optimal level of CRR and the appropriateness of CRR as a monetary policy instrument- this is like a tax on banks and thus acts as a disincentive leads to dead weight loss. RBI is thus looking ahead to keep it as low as possible. Reserve requirement ratios lead to drastic changes and

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thus lead to highly volatile results. It is a blunt instrument but very useful.

(b) OMO's are emerging as the primary operating instrument of monetary policy in the Indian economy. Not only the outright transactions but RBI has been able to inject liquidity via repos under Liquidity adjustment facility.

Benefits of LAF-

- Helps stabilize liquidity cycles
- Helps stabilize seasonal liquidity
- Helps stabilize sudden liquidity shocks
- Helps stabilize markets in face of sudden capital outflow
- Helps neutralize the impact of market volatility on the cost of public debt
- Helps stabilize markets in face of sustained capital flows

Challenges of Liquidity Management

The assessment of market liquidity for conduct of monetary policy is essential and this is another critical issue. The issues with estimation of market liquidity are:

1. The regime followed is that of average reserve requirement with stipulated minimum which itself makes computation of excess reserves problematic. These are computed over a fortnight then how can they be efficiently used in day to day liquidity management?
2. The demand for settlement balances are equally hard to estimate because the process of market development makes inter-temporal comparisons difficult.

3. Large capital inflows also pose challenge to liquidity management.

Management of Capital Flows

This refers to absorbing the foreign exchange in the Reserve Bank's balance sheet to stabilize exchange market and then sterilizing the monetary impact off domestic assets. With large capital inflows RBI began to run out of government securities making sterilization difficult. The excess liquidity was mopped out via primary auctions. **Market Stabilization Scheme** (2004) under which RBI could issue government papers to absorb liquidity.

Other issue was regarding the precise role of policy rates. RBI used fixed price auctions to transmit signal about the interest rate whereas the interest rates under LAF was market determined.

CHAPTER – 5.5

ANNUAL REPORT OF RBI

Monetary Policy Stance

- Till **December 2011** – Containing inflation and anchoring inflation expectations
- When growth decelerated, there was a need of balance between low and stable inflation and growth stabilization.
- **November 2011 – March 2012** – Liquidity conditions remained tight
- Reserve Bank responded by CRR cuts and large scale OMOs to offset the autonomous drain in liquidity

EurekaWow

- Liquidity deficit condition moved back to the comfort zone in 2nd Quarter of 2012-13

Monetary Policy Operations – Context and Rationale

Challenges

Challenges of high and persistent inflation at the beginning of 2011-12 WPI inflation – 9.7%, non-food manufacturing inflation 7.7% (compared to 4% in the last year)

Response

In response, RBI raised repo rates five times (cumulative = 175 basis points, i.e., 1.75%)

Result

Softening of inflation pressure by December 2011, growth decelerated

2011-12

In 4th quarter, signs of inflation again, risks to growth further increases (growth projection down from 7.6 % to 7%, liquidity deficit remained beyond the comfort zone

Response

RBI reduced CRR by a total of 125 basis points (bp) in January 28, 2012 and March 10, 2012. Repo rates reduced by 50 bp to 8% on April 17, 2012

Concerns thereafter

Market deterioration in global and financial conditions plus moderation in domestic growth resulted in inflation levels inconsistent with sustainable growth

Response

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Fearing exacerbation of inflationary pressures, no change in CRR or repo rates till June 2012, but to make situation better, RBI reduced SLR of Scheduled Commercial Banks (SCBs) from 24% to 23% on August 11, 2012.

New Operating Procedure of Monetary Policy

What did RBI do?

Introduced a new operating procedure of monetary policy in May 2011 to have an explicit operating target, a single policy rate and a formal corridor system within a 100 bps spread on either side of the policy rate to replace the earlier system of repo and reverse repo as policy rates without having an explicit target and a fixed width formal corridor.

Result

Call rate stabilized, led to greater integration of financial markets, increased alignment between rates on debt market instruments and call rate.

Performance of the Base Rate System

Introduced when? July 2010

Why? To address concerns posted by BPLR system (Benchmark Prime Lending Rate)

Contribution? Improvement in the pricing of loans, increased transparency in lending rates and improvement in assessment of the transmission of monetary policy and deregulation of interest rates on lending by commercial banks

Deregulation of the Savings Bank Deposit Rate

PROS

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a) Made the rate flexible along with other interest rates depending on the market conditions.

b) It not only reduced its relative attractiveness but adversely affected the transmission of monetary policy.

c) Owing to regulation of interest rate, there was hardly any competition which inhibited product innovations.

CONS

a) Source of cheap funds for banks. In addition, banks treat a large portion of savings deposits as 'core' deposits, which are used to finance long-term assets. This raised the concern that deregulation might lead to an unhealthy competition.

b) Banks might be discouraged from maintaining savings deposits with small amounts due to the associated high transaction costs.

c) In the event, if savings deposit interest rates decline markedly, income flow to small savers/pensioners may get affected adversely.

d) Following deregulation, some banks may introduce some complex products, which may not be so easily understood by savers. These strategies may result in increase in the mis-selling of savings bank products.

Impact of deregulation of rupee interest rates on October 25, 2011

- So far no unhealthy competition seen.
- The 15 SCBs which raised saving deposit rate have seen above average growth.
- A survey shows non-interest charges of banks haven't increased in post-deregulation period.

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Bank Rate Alignment

Bank Rate has been aligned with the MSF rate through one time technical adjustment.

When? February 13, 2012

Liquidity Management

What did RBI do?

- April 2011 – Extended additional liquidity support to SCBs under LAF
- Repo auction under LAF was in the morning slot and Reverse repo under LAF was now conducted in the afternoon time to encourage market participants to trade amongst themselves and park any surplus with RBI
- November 2011 – Conducted OMO purchase auctions of government securities
- December 2011 – Additional repo operation under LAF to provide flexibility to the SCBs; also permitted banks to avail funds on overnight basis under the MSF against their excess SLR holdings.
- January 2012 - Reduced CRR of scheduled banks by 50 bps when liquidity stress persisted
- March 2012 – Liquidity further tightened – RBI reduced CRR by 75 bps; also conducted additional LAF Repo to provide flexibility to SCBs
- April 2012 – Borrowing limit of SCBs under the MSF was raised from 1% to 2%
- August 2012 – SLR was reduced from 24 to 23%

Result

Liquidity stress eased in 2nd Quarter of 2012-13 so far and the extent of deficit has remained close to RBI's comfort level of 1%.

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QUESTIONS

1. What are the problems in monetary policy making faced by monetary authorities? (Hint: Lags, etc.)
2. Examine the case for price stability as a monetary policy objective with particular reference to EMEs like India.
3. What is Impossible Trinity? How have EMEs managed their way out of this Impossible Trinity?
4. What are the steps that a Central Bank can take to improve liquidity conditions in the economy? Answer with reference to the steps taken by the Reserve Bank over the last 2-3 years to ease liquidity conditions.
5. Analyze the various intermediate targets giving pros and cons of each.
6. Analyze the balance sheet of RBI. Explain clearly the liabilities and the assets of RBI.
7. Describe the functions and the roles of RBI with special emphasis on the role played in easing liquidity conditions.