Department of Commerce

University of Calcutta

Study Material
Cum
Lecture Notes

Paper: CC 303

Subject: FINANCIAL MARKETS AND FINANCIAL ENGINEERING

Only for the Students of M.Com. (Semester III)-2020
University of Calcutta
(Internal Circulation)

Department of Commerce
University of Calcutta

STUDY MATERIAL FOR INTERNAL CIRCULATION OF M.COM STUDENTS

M.Com/ 3rd Semester

Subject: FINANCIAL MARKETS
Paper: CC 303 / Module I

Name of the Faculty: Professor (Dr.) S.S.Saha

[DAY AND EVENING SHIFT]

TOPICS

1. An Overview of Economy and the Financial System
2. Money Market Operations
3. Capital Markets
4. Primary Capital Market Operations
5. Secondary Capital Market Operations
6. Debt Market Operations

Material prepared from the following Reference Book:

Saha S.S., Indian Financial System: Financial Markets, Institutions and Services | Second Edition| 2020 | McGraw Hill Education (India) Private Limited | New Delhi

Suggested Readings

- Saha, S.S., Indian Financial System: Financial Markets, Institutions and Services, McGraw-Hill Education (India) Pvt. Ltd. ., 2nd Edtion, New Delhi.
- Saha, S.S., Merchant Banking and Financial Services, Scholar's Press, Germany.
- Saha, S.S., Capital Markets and Securities Laws, Taxmann Publications Pvt. Ltd., 2nd ed., New Delhi.
- Pathatak, B.V., Indian Financial System, Pearson Education, New Delhi.
- Bhole,L.M., Financial Markets and Institutions, New Delhi.
- Khan, M.Y., Indian Financial System, McGraw-Hill Education (India) Pvt. Ltd., New Delhi.

UNIT 1: AN OVERVIEW OF ECONOMY AND THE FINANCIAL SYSTEM

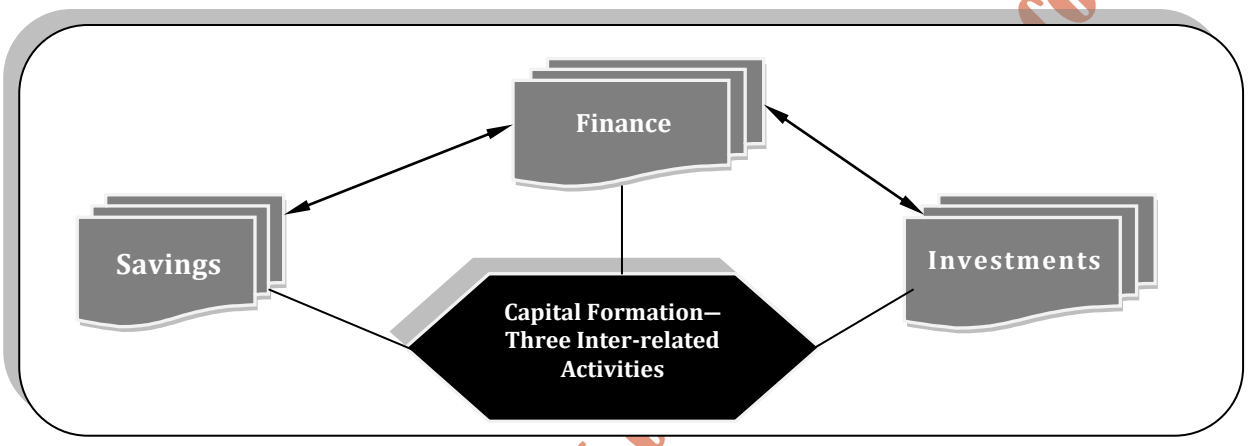
INTRODUCTION

The financial system, a set of composite and closely interconnected financial institutions/intermediaries, markets, services, assets and regulatory bodies, is the most significant institutional and functional medium for economic transformation. Financial systems are of essential significance to formation of capital in financing corporate. Savings, investments and finance are the three interrelated activities in the process of capital formation.

SAVINGS, INVESTMENTS AND FINANCE: INTER-RELATED ACTIVITIES

The financial system plays a vital role to economy for formation of capital. The formation of capital is made through financial system involving collection of savings and their distribution for investment in industry in order to accelerate the process of economic growth in the economy. Therefore, there are three inter-related activities in the process of formation of capital: (a) savings; (b) investments; and (c) finance.

Exhibit 1: ***Savings, Investments and Finance: Inter-Related Activities***



Truly speaking, savings and investments are considered to be significant macro-economic variables with micro-economic foundations for promoting sustainable economic growth in the economy. However, the quantum of capital generation in the economy depends upon potency and effectiveness of these three inter-related activities. Hence, the proficiency of savings mobilization, the competence of financial system and the channelization of these savings into attractive and productive forms of investment are all inter-linked for the economic development.

DIFFERENT FINANCIAL INNOVATIONS AND DEVELOPMENTS IN THE FINANCIAL SYSTEM

The functions of financial system are gone through various financial innovations and developments in the financial system of an economy, which truly refers to financial techniques. Here, we need to understand: (i) rudimentary finance; (ii) direct finance; and (iii) indirect finance.

Exhibit 2 : *Different financial innovations and developments in the financial system*

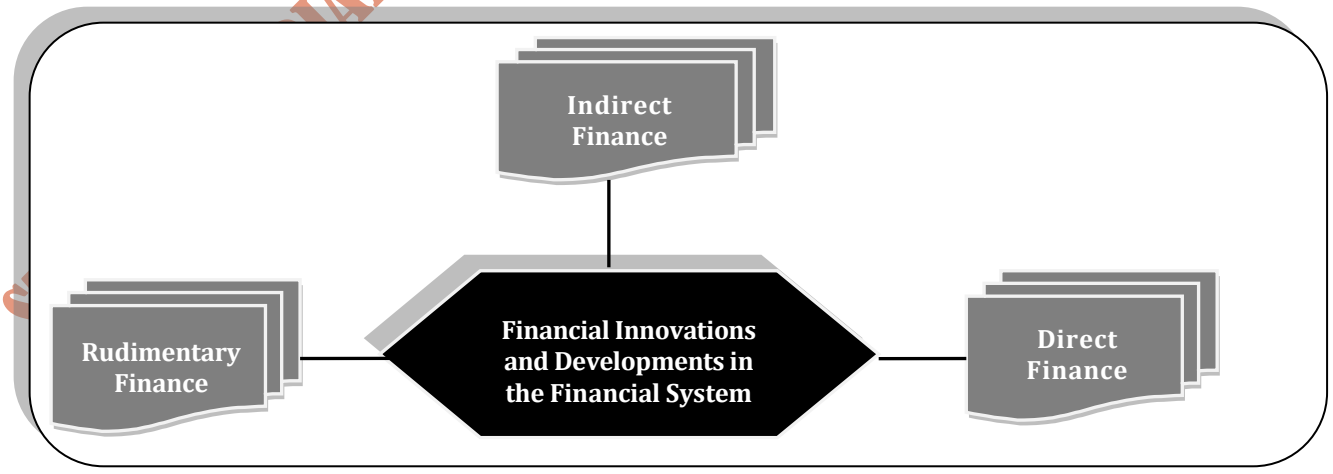


Exhibit 3: *Direct Finance without Intermediation*

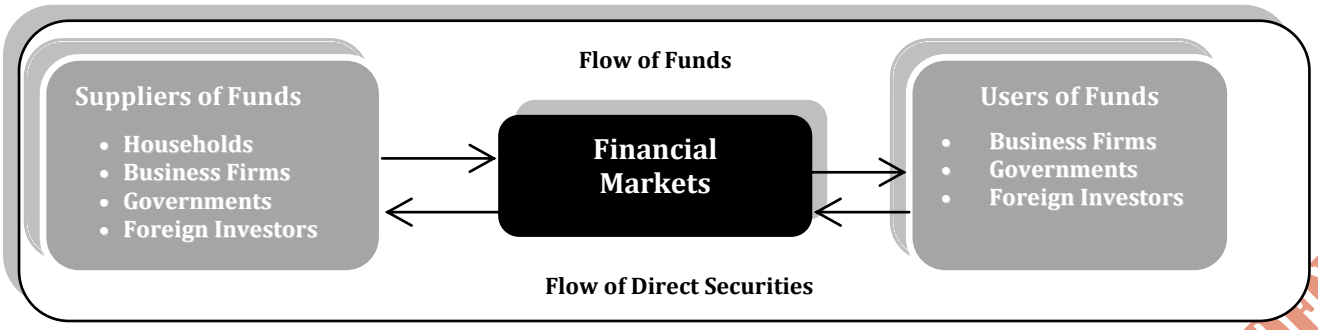
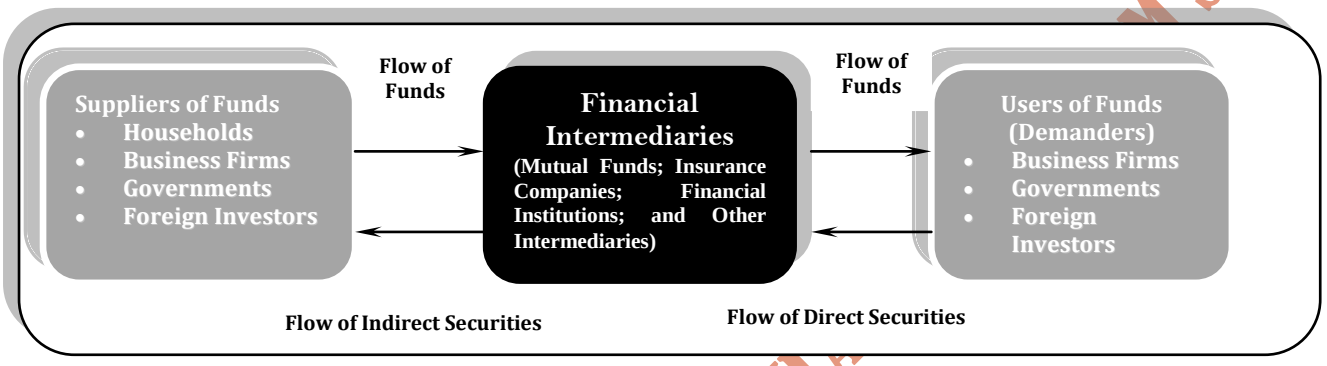


Exhibit 4: *Indirect Finance Process with Intermediation*



FINANCIAL SYSTEM IN INDIA

Financial system assists to channelize funds from surplus to deficit units. Deficit units are those where current expenditure exceeds current income; surplus units are those where current income exceeds current expenditure. An efficient financial system efficiently mobilizes savings (i.e. money resources) into different investment avenues and helps in accelerating the rate of economic development. It also plays a crucial role in allocating scarce capital resources to productive use. It provides a link between savings and investments for the creation of new wealth and allows portfolio adjustment in the composition of the existing wealth. Indian financial system consists of regulatory bodies, financial institutions/intermediaries, financial markets, financial instruments, and financial services.

STRUCTURE OF INDIAN FINANCIAL SYSTEM

The financial system in India comprises financial regulators; financial institutions/intermediaries; financial markets; financial services and financial instruments. Financial regulators in India mainly include: (i) the Department of Economic Affairs (DEA); (ii) the Department of Company Affairs (DCA); (iii) SEBI; (iv) Stock Exchanges; (v) RBI; and (vi) IRDA. Financial institutions mainly consist of: (i) commercial and co-operative banks; (ii) Regional Rural Banks (RRBs); (iii) Non-banking Financial Companies (NBFCs); and (iv) development financial institutions including: all-India financial institutions, state-level financial institutions and other financial institutions like: public sector mutual funds, private sector mutual funds, life insurance and general insurance companies. The financial market, in India, comprises: (i) the money market; (ii) the Government securities market; (iii) the foreign exchange market; (iv) the capital market; and (v) the derivatives market. There are diverse financial services operating in India. These are: (i) fee-based services; (ii) fund-based services; and (iii) insurance services. Financial instruments comprise: direct/primary instruments; indirect instruments; and derivatives instruments. Exhibit 1.5 depicts the structure of the financial system in India. Let us have a brief idea of the structure of the Indian financial system.

Financial Markets

A Financial Market can be defined as one in which financial assets are created or transferred. While a real transaction involves exchange of money for real goods or services; a financial transaction involves the creation or transfer of a financial asset. Financial Assets, or Financial Instruments, represent a claim to the payment of a sum of money, sometime in the future, and/or periodic payment in the form of interest or dividend. The salient features of financial markets are stated below:

(a) Financial market is a market where lenders of funds and the borrowers of funds come together for mobilization of funds;
(b) Corporate sectors raise short-term as well as long-term funds from financial markets (i.e. money market as well as primary capital market)
(c) Financial instruments/products are exchanged or traded from one investors to another;
(d) Institutions that facilitate the trade in financial instruments /products are stock exchanges (BSE, NSE, and others);
(e) It deals with the multicurrency requirements, which are met by the exchange of currencies called foreign exchange market. The transfer of funds takes place in this market depending upon the exchange rate.

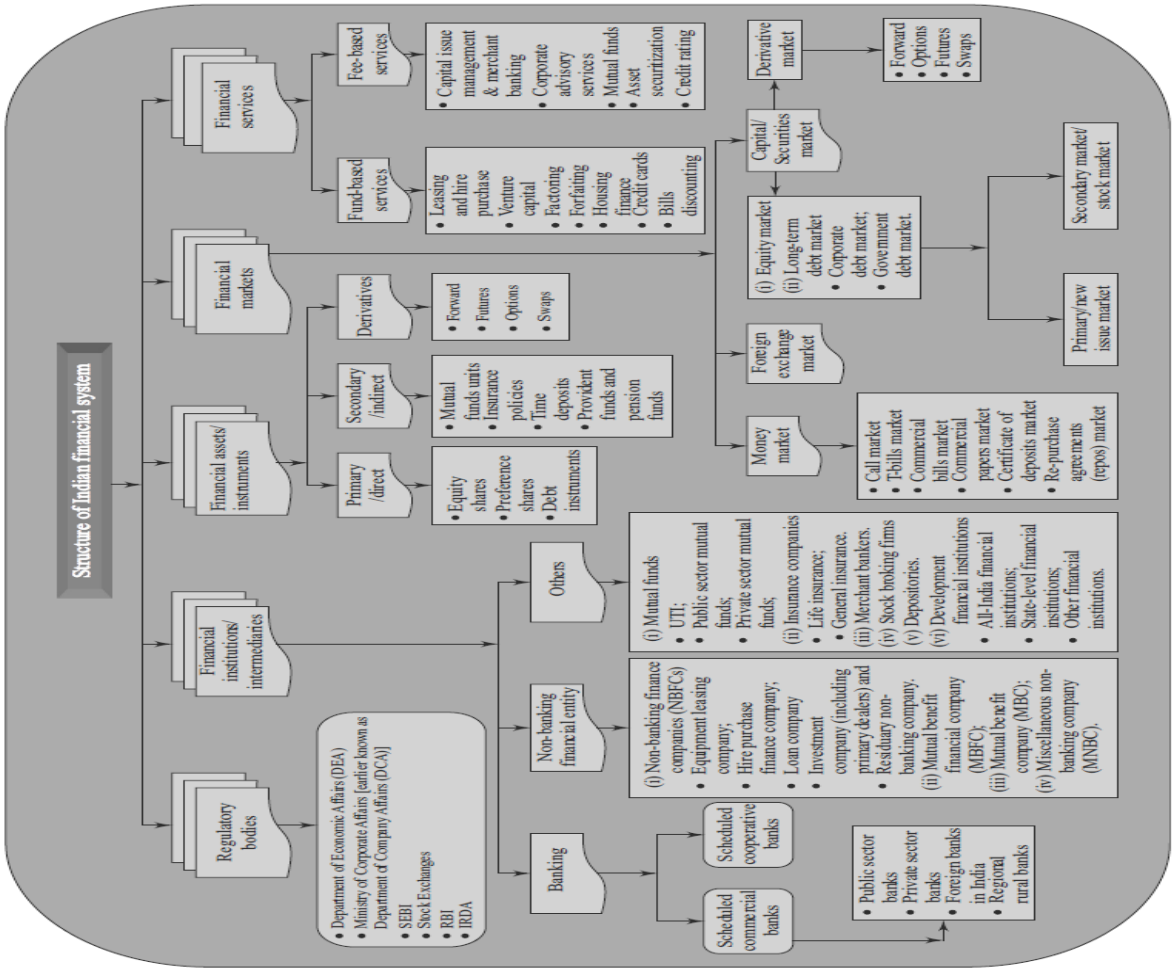
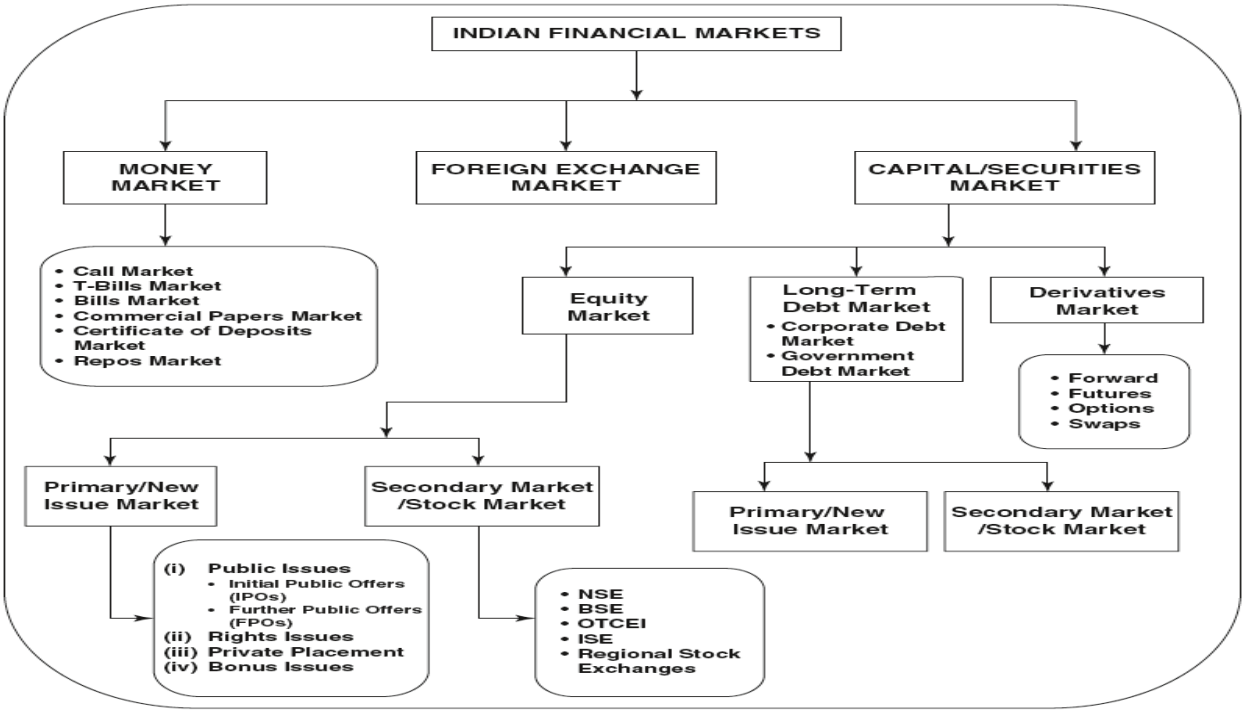


Exhibit 5: *Structure of Indian Financial System*

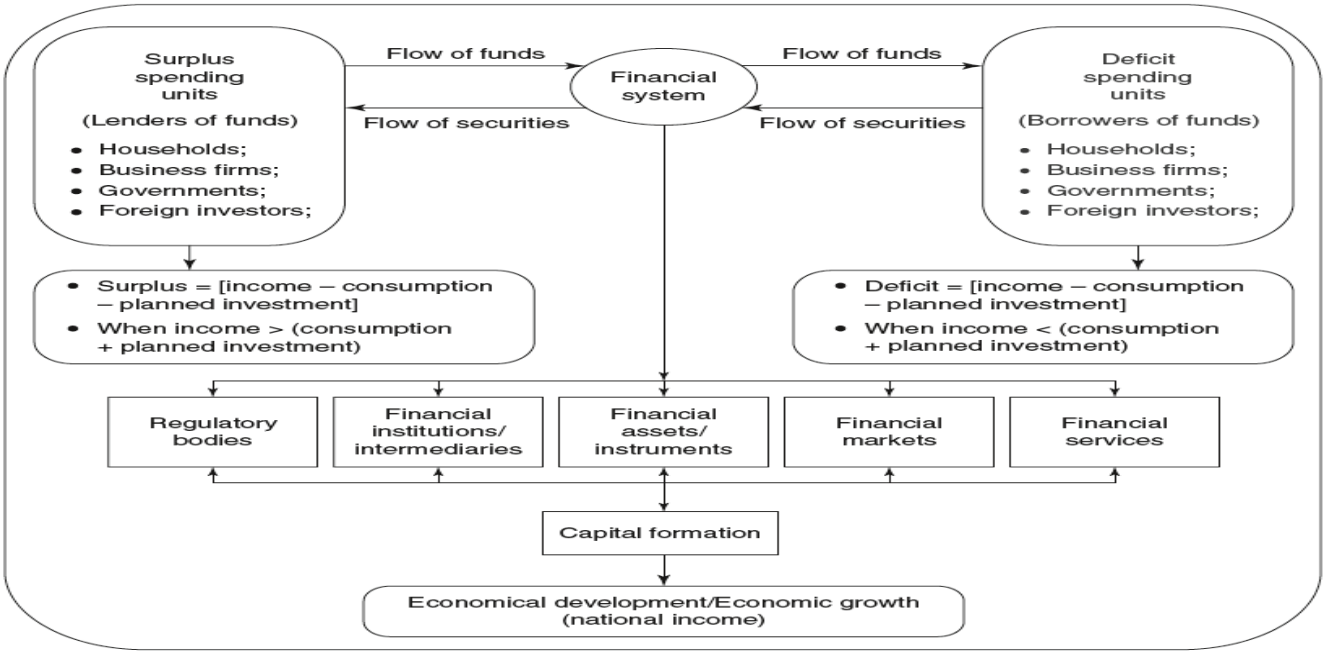
Exhibit 6: *Financial Markets in India*



However, the economic development of any country can be viewed on the basis of growth in the national and per capita income. An increase in the national income indicates the economic growth of a country.

The sum total of gross value added at factor cost for all the sectors (i.e. agriculture and allied activities, industry and services sectors) represents the Gross Domestic Product (GDP) at factor cost. The Gross National Product (GNP) is obtained by adding net property (factor) income from abroad to the GDP at factor cost. The Net National Product (NNP) is calculated by deducting depreciation of the capital stock from GNP at factor cost. This Net National Product is known as the National Income.

Exhibit 7: *Financial System and Economic Development*



Components of GDP by expenditure approach: GDP (Y) is the sum of Personal Consumptions (C), Business Investments (I), Government Spending (G) and X (net exports of goods and services, or imports minus exports). To calculate the components of GNP, GNP = C + I + G + X + Z. Z stands for (net income earned by domestic residents from overseas investments — net income earned by foreign residents from domestic investments.). NNP =GNP— Deprecation on capital stock. Per capita income=NNP (i.e. NI) ÷ Population of the nation.

It is needless to mention that the National Income is measured on the basis of the Gross Domestic Product (GDP) of a country. Therefore, GDP is the yardstick of measuring the growth performance of an economy. However, the impact of economic reforms, which is reflected in the GDP, ultimately indicates the economic growth and development of a country. On the other hand, the growth of the GDP, in any economy, depends upon the increase in the proportion of savings and investment to the GDP of a nation.

Securities markets/ financial markets as a part of financial system contribute a significant role to continual economic growth. It is evident that movement of funds always flows from surplus sectors to deficit sectors. In other words, those having surplus of funds lend it to those requiring funds to meet their requirement. Broadly speaking, in corporate sectors the surplus funds is mobilized from the investors or lenders to the corporate sectors for the purpose of production or sale of goods and services. This is done with the help of financial markets where there are mainly two different groups, one investing or lending funds and the others, who borrow or use the funds. These two groups meet and transact with each other through a mechanism called financial markets. So, the financial markets operate as a link between lenders of funds and the borrowers or users of funds. It basically plays an intermediary role between the borrowers and lenders of funds.

FINANCIAL MARKETS IN GLOBALISED FINANCIAL SYSTEM

Globalization involves creation of networks and activities in excelling economic, social and geographical boundaries, which brings out integration of the economy of the country with the world economy. It is an outcome of the set of various policies aimed at transforming the globe towards greater interdependence and integration. In 1991, a crisis in the balance of payments in India led to the introduction of economic reforms in the country. India became part of the globalization process and entered into the liberalized economy in 1991 as

a part of economic reforms. Since the early 1990s, the introduction of financial sector reforms in India provided a strong impetus to the development of financial markets.

THE COMMITTEE ON THE GLOBAL FINANCIAL SYSTEM (CGFS)

The Euro-Currency Standing Committee (ECSC) was established to monitor international banking markets in 1971. Primary focus of ECSC was on the monetary policy implications of the rapid growth of off-shore deposit and lending markets. However, the ECSC was renamed as the Committee on the Global Financial System (CGFS) by the G10 Governors on 8th February 1999. With the passage of time, the CGFS shifted its concentration gradually more to financial stability questions and to structural change in the financial system. Members of CGFS comprise deputy governors, other senior officials of central banks, and the Economic Adviser of the Bank for International Settlements (BIS). The member institutions are: (a) Reserve Bank of Australia; (b) Bank of Korea; (c) National Bank of Belgium; (d) Central Bank of Luxembourg; (e) Central Bank of Brazil ; (f) Bank of Mexico; (g) Bank of Canada; (h) Netherlands Bank; (i) People's Bank of China; (j) Monetary Authority of Singapore; (k) European Central Bank; (l) Bank of Spain; (m) Bank of France; (n) Sveriges Riks bank; (o) Deutsche Bundesbank; (p) Swiss National Bank; (q) Hong Kong Monetary Authority; (r) Bank of England; (s) Reserve Bank of India; (t) Board of Governors of the Federal Reserve System; (u) Bank of Italy; (v) Federal Reserve Bank of New York; and (w) Bank of Japan. The main functions of the CGFS are as follows:

(i) monitoring developments in global financial markets for central bank Governors;
(ii) identifying and assessing potential sources of stress in global financial markets;
(iii) promoting the understanding of the structural underpinnings of financial markets;
(iv) encouraging improvements to the functioning and stability of these markets;
(v) promoting the development of well-functioning and stable financial markets and systems through an examination of alternative policy responses and the elaboration of corresponding policy recommendations;
(vi) paying attention to the nexus between monetary and financial stability, to the linkages between institutions, infrastructures and markets, to the actual and potential changes in financial intermediation.

FEATURES OF DEVELOPED CAPITAL MARKET: THE INTERNATIONAL ORGANIZATION OF SECURITIES COMMISSIONS (IOSCO)

In 1998, a comprehensive set of Objectives and Principles of Securities Regulation (IOSCO Principles) was adopted by the IOSCO. IOSCO Principles was recognized as the international regulatory benchmarks for all securities markets. In 2003, the organization endorsed a comprehensive methodology (IOSCO Principles Assessment Methodology). In 2002, a multilateral memorandum of understanding (IOSCO MMoU) was adopted by the IOSCO in order to facilitate cross-border enforcement and exchange of information among international securities regulators. In 2005, the IOSCO endorsed the IOSCO MMoU as the benchmark for international cooperation among securities regulators. The SEBI is also one of the signatory to IOSCO MMoU. The MMoU sets an international benchmark for cross-border co-operation critical to combating violations of securities and derivatives laws. It represents a common understanding amongst its signatories about how they will consult, cooperate, and exchange information for securities regulatory enforcement purposes.

IOSCO Objectives

(i) To cooperate in developing, implementing and promoting adherence to internationally recognized and consistent standards of regulation, oversight and enforcement in order to protect investors, maintain fair, efficient and transparent markets, and seek to address systemic risks;
(ii) To enhance investor protection and promote investor confidence in the integrity of securities markets, through strengthen information exchange and cooperation in enforcement against misconduct and in supervision of markets and market intermediaries; and
(iii) To exchange information at both global and regional levels on their respective experiences in order to assist the development of markets, strengthen market infrastructure and implement appropriate regulation.

The Financial System in the United States (U.S.)

The United States, a federal republic and a representative democracy, is oldest surviving federation in the world. It is a federal republic and a representative democracy. The U.S. is a founding member of the United Nations, World Bank, International Monetary Fund, Organization of American States (OAS), and other international organizations. The financial system in U.S. is the most widespread and composite in the globe. The U.S., a capitalist mixed economy, is a highly developed country, with the world's largest economy by nominal GDP accounting for approximately a quarter of global GDP. Services and knowledge-based activities are the main features of the U.S. economy, while it has an important manufacturing base representing the second-largest in the world. It holds the largest share of global wealth with 31% of the total wealth in the world, while its population is only 4.3% of the total population in the world. Though it shows a wide income and wealth disparities, it continues to rank very high in terms of socioeconomic performance, comprising average wage, human development, per capita GDP, and worker productivity.

All the financial sector institutions in the U.S. are grouped into four categories: (a) Depository Institutions; (b) Insurance Companies and Pension Funds; (c) Government and Government- Sponsored Agencies, including the Federal Reserve; and (d) Non-Bank Intermediaries, i.e. the institutions that correspond to the shadow banking system. The details are as follows:

Sl.No.	Categories	Financial Sector Institutions
1	Depository Institutions and Affiliates	• U.S. Chartered Depository Institutions • Foreign Banking Offices in U.S. • Credit Unions • Banks in U.S. Affiliated Areas
2	Insurance Companies and Pension Funds	• Life Insurance • Private Pension Funds

		• State and Local Govt. Retirement Funds • Federal Govt. Retirement Funds • Property-Casualty Insurance
3	Government and Government-Sponsored Agencies	• Government-Sponsored Enterprises(GSE) • Federal Reserve • Agency and GSE-Backed Mortgage Pools
4	Non-Bank Intermediaries	• Mutual Funds • Holding Companies • Money Market Mutual Funds • Funding Companies • Brokers and Dealers • Asset-Backed Securities Issuers • Finance Companies • Exchange-Traded Funds • Real Estate Investment Trusts • Closed-End Funds

The Financial System in China

The socialist market economy of the People's Republic of China is the second largest economy in the world based on nominal GDP. As a largest manufacturing economy and exporter of goods, it has fastest-growing consumer market and second-largest importer of goods in the world. Most of financial institutions in China are owned and governed by the government. The Central Bank of China was replaced by the People's Bank of China (PBC) in 1950 and it gradually took over private banks. With a view to fulfilling many of the functions of other central and commercial banks, the PBC issues the currency, controls circulation, and plays a significant role in disbursing budgetary expenditures. Moreover, international trade and other overseas transactions are also made by the PBC. On the other hand, the Bank of China (BOC) manages remittances by overseas Chinese. However, the chief instruments of financial and fiscal control are the People's Bank of China (PBC) and the Ministry of Finance and both are under the authority of the State Council. There are other financial institutions comprising (a) the China Development Bank (CDB); (b) the Agricultural Bank of China (ABC); (c) the China Construction Bank (CCB); and (d) the Industrial and Commercial Bank of China (ICBC).

The Financial System in Germany

The economy of Germany, a highly developed social market economy, has the fourth-largest economy by nominal GDP in the world. Germany is a founding member of the European Union and the Eurozone. There are two key features of the development of the German financial system. The first one is that Germany is a prime example of a bank based financial system. The second key feature is that the publicly owned savings banks and the cooperative banks that are not primarily motivated by making a profit are integral part of German financial system. Both of which have their origin in the pattern of industrialization in the second half of the nineteenth century.

As far as Securities markets are concerned, the big banks were keen to develop new business opportunities pertaining to investment banking. In the mid-1980s, an initiative was taken by a group of big banks to persuade the development of securities markets in Germany and to promote Frankfurt as a financial centre. Though there are also five smaller exchanges in other cities, the main securities market in Germany is in Frankfurt. The Frankfurt Stock Exchange originated in the 16th century, continued until 1991 by the Frankfurt Chamber of Commerce. In 1990, the Frankfurter Wertpapier AG was founded as a new company, which was renamed the Deutsche Börse (German stock exchange) AG in 1992. In 1988, the big banks took initiative to establish the Deutsche Terminbörse (German Derivatives Exchange, DTB) as a screen based futures and options exchange, its trading started in 1990. However, the DTB and the Swiss Options and Financial Futures Exchange were merged to form Eurex in 1998. In 2007, Eurex took over the International Securities Exchange in Chicago.

The Financial System in United Kingdom

The economy of the United Kingdom, highly developed and market-oriented, is the fifth-largest national economy in the world based on nominal gross domestic product (GDP). In the 18th century, the UK became the first country to industrialize and it had a leading role in the global economy during the 19th century. The pound sterling, the world's fourth largest reserve currency, is the currency of the UK followed by the United States Dollar, the Euro and the Japanese Yen. Its currency is one of the 10 most-valued currencies in the globe as well. The UK has become a member of the Commonwealth, the European Union, the G7, the G20, the International Monetary Fund, the Organization for Security and Co-operation in Europe, the World Bank, the World Trade Organization, Asian Infrastructure Investment Bank and the United Nations.

The central part of the financial system in U.K. is the essential intermediation between households and non-financial corporate. A significant user of the financial system is also the government not only for the financing of government debt, but also for savings. Moreover, the household's sector services are of short and long term finance. Short term finance comprises basic retail banking services including current accounts, short term deposit accounts and payments system, whereas long term services consist of the provision of long term savings and borrowing mechanisms. Long terms savings comprise pensions, mutual funds, long term deposits and insurance, including life and housing insurance.

The Italian Financial System

The Italian economy, the third largest national economy in the eurozone has become the ninth largest by nominal GDP in the world. Significant variety of products including machinery, vehicles, pharmaceuticals, furniture, food, clothing, and robots are largely

manufactured and those are exported in the foreign market. There are three main phases of Italian economic history comprising (a) an initial period of struggle after the unification of the country in 1861; (b) a central period of robust catch-up from the 1890s to the 1980s; and (c) a final period of sluggish growth. An initial period of struggle after the unification of the country was represented by high emigration and stagnant growth, while central period of economic scenario was interrupted by the Great Depression of the 1930s and the two world wars. However, final period of economic scenario witnessed a slow growth due to a double-dip recession following the 2008 global financial crisis. Since then the country is slowly recovering only in recent years. In 2017, Italian economic growth came to enhance considerably, while economic expansion became more balanced across demand components and economic sectors.

UNIT 2: Money Market Operations

INTRODUCTION

The money market is an integral part of the financial markets in India. It provides an opportunity for making a balance between the surplus funds of lenders and the requirements of borrowers for short periods. Truly speaking, the money market provides a focal point for central bank's [Reserve Bank of India (RBI)] intervention for influencing the liquidity in the financial system. As we know that the main role of RBI in the money market is to maintain the liquidity and short-term interest rates at levels consistent with the monetary policy of the nation.

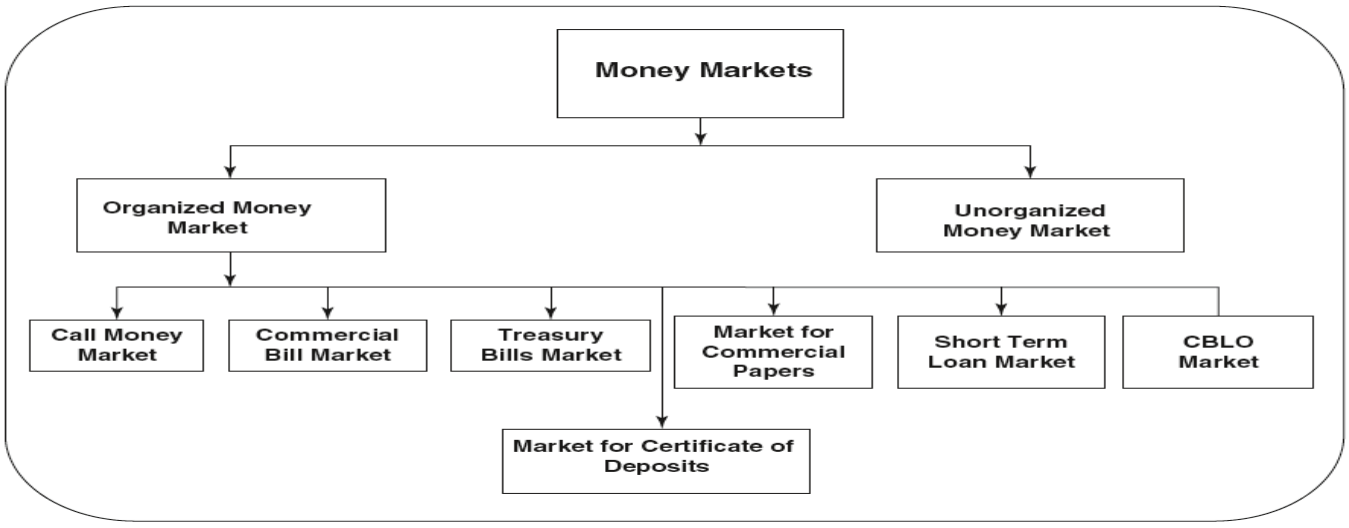
MONEY MARKET

(i) It is market merely for short-term funds or financial assets called near substitutes for money;
(ii) It deals with monetary assets whose period of maturity is less than or up to one year;
(iii) It deals with financial assets which can be promptly converted into money without loss and with minimum transaction cost;
(iv) Normally, transactions in money market take place through phone(i.e., oral communication) or mail;
(v) Relevant documents and written communications for generating fund are exchanged subsequently in this market;
(vi) There is no formal place of market like stock exchange where stock market transaction takes place;
(vii) Transactions are made without the help of brokers;
(viii) The main intermediaries of a money market are the Central Bank (RBI), Commercial Banks, Non-banking financial companies, discount houses, etc.

STRUCTURE OF MONEY MARKETS IN INDIA

The money market in India can be divided into two components. These are (a) the organized money market and (b) the unorganized money market or unauthorized money market. Both of these components consist of several constituents. As far as organized money market is concerned, there is a reasonable real interest rate.

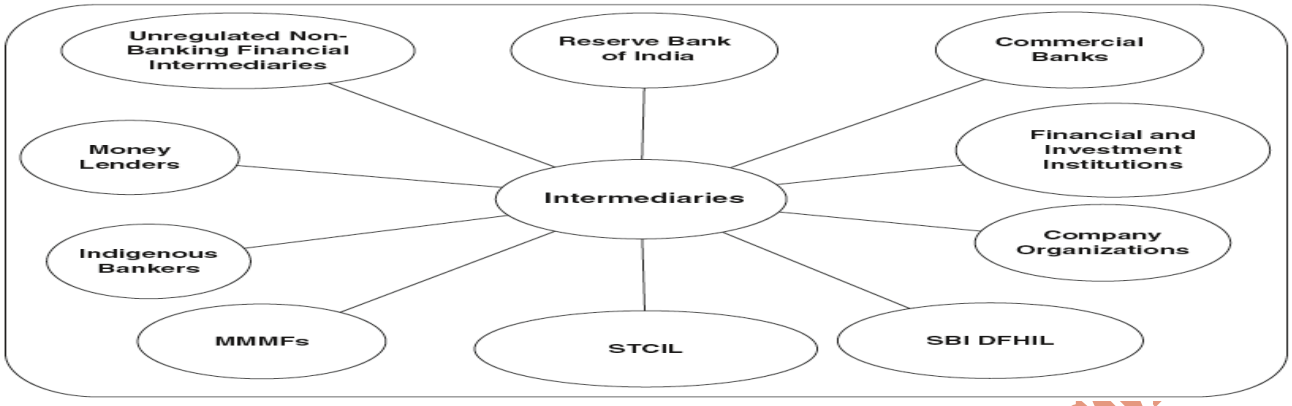
Exhibit 1: *Money Markets Structure*



INTERMEDIARIES / PARTICIPANTS OF MONEY MARKETS

A brief design about major participants or intermediaries in the organized as well as unorganized money market is as follows:

Exhibit 2: *Intermediaries of Money Markets*

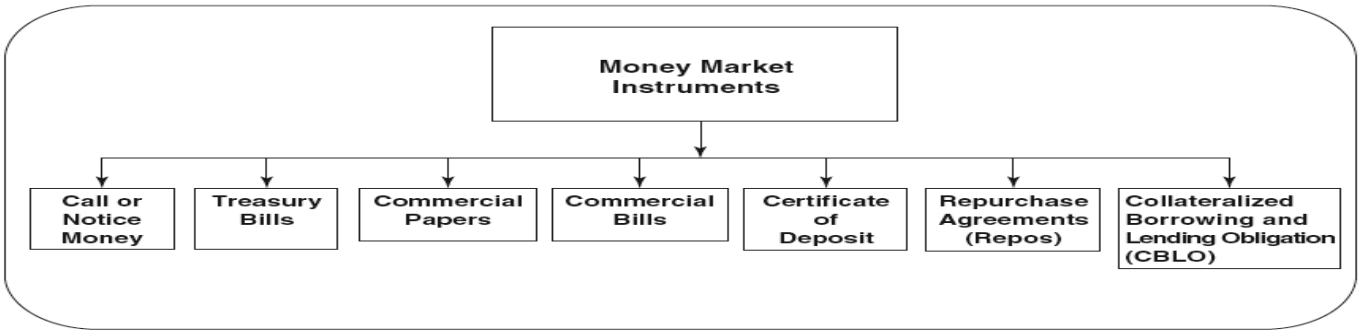


MONEY MARKET INSTRUMENTS IN INDIA

The money market consists of a number of instruments which collectively constitute the money market. Some of the important money market instruments are as below (Exhibt-3.3):

(i) *Call or Notice Money*
(ii) *Treasury Bills*
(iii) *Commercial Papers*
(iv) ***Commercial Bills***
(v) *Certificate of Deposits*
(vi) *Repurchase Agreements (Repos)*

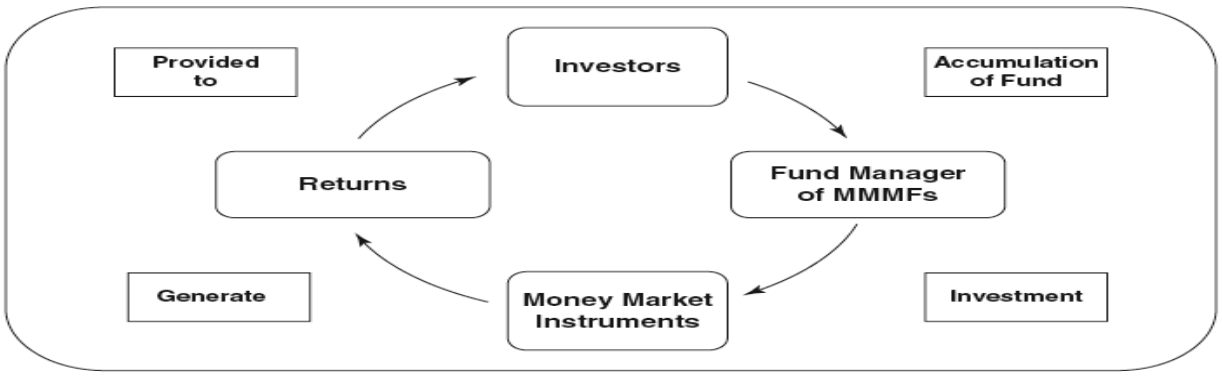
Exhibit 3: *Money Market Instruments*



MONEY MARKET MUTUAL FUNDS (MMMFs)

The RBI constituted a task force to inspect the broad framework of money market outlined in April 1991. In April 1992, the RBI announced a detailed scheme of MMMFs after having the recommendations of the task force. MMMFs are the medium, which bridge the gap between small individual investors and the money market.

Exhibit 4: *Working of a MMMFs*



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M.Com. Sem-III: Financial Engineering (Mod-II)
Prepared by Prof. Ashish Kumar Sana

Paper CC.303: Financial Markets and Financial Engineering

Module-II: Financial Engineering

7. **Introduction:** Contributing Factors- the Scope of Financial Engineering; Tools of Financial Engineering-Financial Engineering vs. Financial Analysis; Nature and Types of Derivative Securities-Basic Characteristics of Derivative Securities. Indian Derivatives Market-An Overview

- **(Ref:** Cuthbertson Keith and Nitzsche Dirk, *Financial Engineering: Derivatives and Risk Management,* Jossey Bass, 1st Chapter and Das Sundaram, Derivatives Principles and Practice, McGrawhill, 2nd Edition, 1st Chapter)

  [No of Lectures: 2]

8. **Forward Contracts:** Forward Contracts on Currencies -Valuing Forward Contracts-Forward Prices for a Security under Different Situations, Forward Rate Agreement (FRA). (Ref: Hull J C and Srivastava Rajib, Respective Chapters)

   [No of Lectures: 4]

9. **Futures Contracts:** The Nature and Uses of Future Contracts- Mechanics of Buying and Selling, Valuation of Future Contracts-Financial Futures-Stock Index Futures-Foreign Currency Futures-Options on Futures.

   (Ref: Hull J C and Srivastava Rajib, Respective Chapters)

   [No of Lectures: 6]

10. **Option Contracts:** Types of Option Contracts- Trading, Strategies, Option Valuation Single-period Options vs. Multi-Period Options-Option Pricing-Option Pricing Models-Binomial Model-Black-Scholes Model- Option– Path- Dependent Options - Exotic option Contracts.

    (Ref: Hull J C and Srivastava Rajib, Respective Chapters)

    [No of Lectures: 6]

11. **Swap Contracts:** Origin of Swap Contracts- Forms of Swap Contracts-Interest Rate Swaps - Pricing of Interest Rate Swaps-Asset Swaps Forward Swaps- Swaptions-Currency swaps-Commodity swaps Over-the-counter Interest Rate Derivatives.
    (Ref: Hull J C and Srivastava Rajib, Respective Chapters)
    [No of Lectures: 4]
12. **Commodity Derivatives**: Trading Strategies in Commodity Futures Markets; International Commodity Market; Regulatory Framework
    (Ref: Hull J C and Srivastava Rajib, Respective Chapters)
    [No of Lectures: 2]

References

- Cuthbertson Keith and Nitzsche Dirk , *Financial Engineering: Derivatives and Risk Management,* Jossey Bass
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[Distribution of classes is based on normal class room teaching-learning under physical mode. For online / electronic mode of classes under the present situation, teachers concerned may adjust the same.]

FINANCIAL ENGINEERING

Unit 7: Introduction

Financial engineering involves the design, the development and the implementation of innovative financial instruments and processes and the formulation of creative solutions to problems in finance.

i) Financial engineering is the use of mathematical techniques to solve financial problems.

ii) Financial engineering uses tools and knowledge from the fields of computer science, statistics, economics, and applied mathematics to address current financial issues as well as to devise new and innovative financial products.

iii) Financial engineering led to an explosion in derivatives trading and speculation in the financial markets.

iv) Financial engineers test and issue new investment tools and methods of analysis. They work with insurance companies, asset management firms, hedge funds, and banks.

Important areas of Financial Engineering

1. **Corporate Finance:** Mergers & Acquisitions, Takeovers, Leveraged Buyouts (LBO) etc.
2. **Trading:** Securities and derivative products trading.
3. **Investment in Money Management:** High yield mutual funds, money market funds and Repo funds
4. **Risk Management:**

Tools of Financial Engineering

(A) Conceptual Tools (Ideas and concepts), Valuation Theory, Portfolio Theory and Hedging Theory

(B) Physical Tools (i) Fixed income securities, (ii) equities (iii) Options (iv) Swaps

Factors Contributing to the Growth of Financial Engineering

(A) Environmental Factors: (i) Price Volatility; (ii) Globalisation of Markets; (iii) Tax Asymmetries; (iv) Technological Advances; (v) Advances in Financial Theory (vi) Regulatory Change and increased Competition (vii) Cost of information and Cost of Transaction

(B) Intra-firm Factors: (i) Liquidity Needs; (ii) Risk Aversion; (iii) Agency Costs (iv) Quantitative Sophistication and Management Training; (v) Accounting Benefits

(Ref: Cuthbertson Keith and Nitzsche Dirk, *Financial Engineering: Derivatives and Risk Management,* Jossey Bass, 1st Chapter)

Derivatives/ Derivative Securities

A derivative can be defined as a financial instrument whose value depends on (or derives from) the values of other, more basic, underlying variables.

A derivative security is a financial security whose payoff depends on (or derives from) other, more fundamental, variables such as stock price, an exchange rate, a commodity price, an interest rate or even the price of another derivative security. The underlying driving variable is commonly referred to as simply the underlying. (Ref. Das Sundaram, Derivatives Principles and Practice, McGrawhill, 2nd Edition, p2).

The underlying assets could be equities (shares), debt (bonds, T-bills, and notes), currencies, and even indices of these various assets, such as the Nifty 50 Index.

Common underlying assets for derivatives are:

- Equity Shares
- Equity Indices
- Debt Market Securities
- Interest Rates
- Foreign Exchange
- Commodities (Wheat, Jute, Gold, Silver, Crude Oil, Plum Oil etc.)
- Derivatives themselves

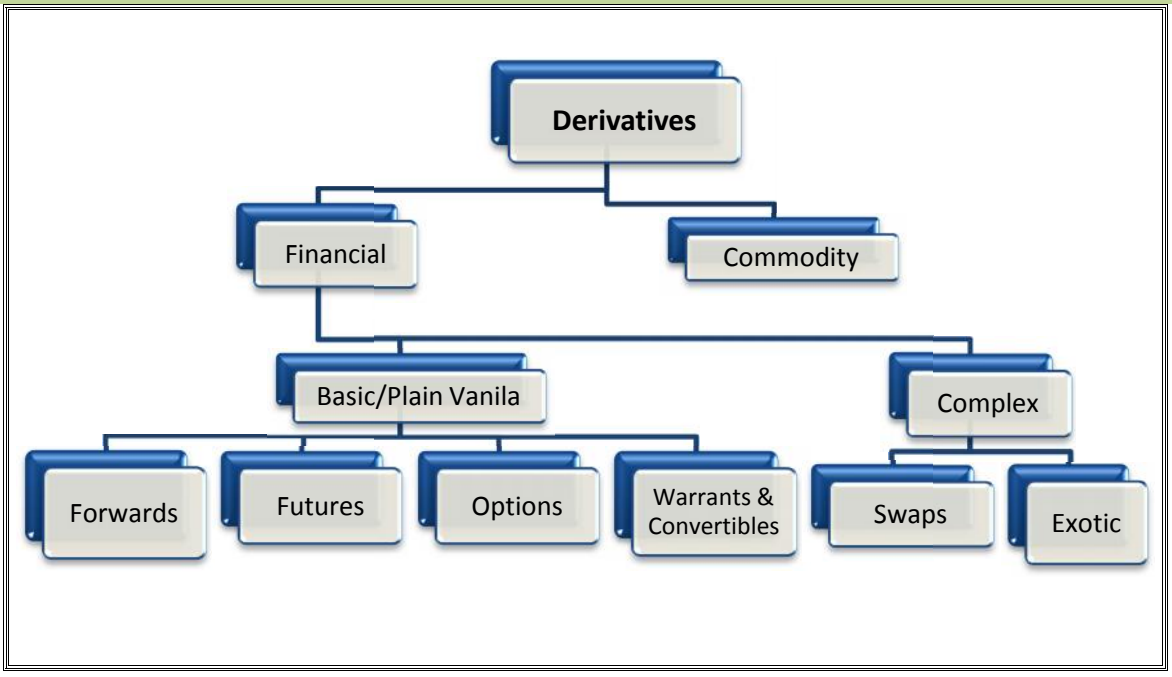
Objectives of Derivatives

i) The basic objectives or purpose of derivatives is to transfer the price risk (inherent in fluctuations of the asset prices) from one party to another
ii) It facilitates to allocate risk to those who are willing to take it.
iii) Derivatives help to mitigate the risk arising from the future uncertainty of prices.

Features of Derivatives

Important features of derivatives are:
i) Derivative is a future contract between two parties
ii) The derivative instruments have the value which is derived from the values of other underlying assets.
iii) The counter parties have specified obligation under the derivative contract.
iv) The derivatives contracts can be undertaken directly between the two parties or through the particular exchange like financial futures contracts.
v) The size of the derivative contract depends upon its notional amount.

Types of Derivatives



Financial Derivatives

In a financial derivative, the underlying instrument may be stocks, treasury bills, bonds, foreign exchange, stock index, gilt-edged securities, etc.

Factors driving the growth of Financial Derivatives

Some of the factors driving *the* growth of financial derivatives are:

i) Increased volatility in asset prices in financial markets.
ii) Increased integration of national financial markets with the international markets.
iii) Marked improvement in communication facilities and sharp decline in their costs.
iv) Development of more sophisticated risk management tools.
v) Innovations in the derivatives markets, which optimally combine the risks and returns over a large number of financial assets leading to higher returns, reduced risk as well as transactions costs as compared to individual financial assets.

Commodity Derivatives

In a commodity derivative, the underlying instrument/asset is a commodity which may be wheat, cotton, pepper, sugar, jute, turmeric, corn, soyabeans, crude oil, natural gas, gold, silver, copper and so on.

Types of Derivative Securities

The most common types of derivatives are forwards, futures, swaps and options.

Forward/Forward Contract

A forward contract is an agreement between two parties to trade in a specified quantity of a specified good or underlying asset at a specified price on a specified date in the future.

- The buyer in the forward contract is said to have a **long position** in the contract; the seller is said to have a **short position**.
- The good specified in the contract is called the **underlying asset** or simply, the underlying.
- The date specified in the contract on which the trade will take place is called the **maturity date** of the contract.
- The price specified in the contract for the trade is called the **delivery price** in the contract. (Ref. Das Sundaram, Derivatives Principles and Practice, McGrawhill, 2nd Edition, p5).

Futures/Futures Contract

Like a forward contract, a futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future for a certain price. Unlike forward contracts, futures contracts are normally traded on an **exchange**. To make trading possible, the exchange specifies **certain standardized features** of the contract. As the two parties to the contract do not necessarily know each other, the exchange also provides a mechanism that gives the two parties a guarantee that the contract will be honoured. (Ref: Hull J.C, *Options, Futures and Other Derivatives,* Pearson Education, p7, 8th Edition)

Buyers and sellers deal through the futures exchange, not directly. Buyers submit buy orders to the exchange, sellers submit sell orders and these are matched via exchange.

Options/Options Contract

An option is a financial security that gives the buyer the right (but not the obligation) to buy or sell a specified asset at a specified price on or before a specified date.

Options are traded both on exchanges and in the over-the-counter market. There are two types of option. A call option gives the holder the right to buy the underlying asset by a certain date for a certain price. A put option gives the holder the right to sell the underlying asset by a certain date for a certain price.

Swap/Swap Contract

A swap is a bilateral contract between two counterparties that calls for periodic exchanges of cash flows on specified dates and calculated using specified rules. The swap contract specifies (a) the dates on which cash flows will be exchanged and (b) the rules according to which the cash flows due from each counterparty on these dates are calculated. . (Ref. Das Sundaram, Derivatives Principles and Practice, McGrawhill, 2nd Edition, p2).

Warrants

It is longer-dated options are called warrants and are generally traded over-the-counter.

lEAPS

The acronym LEAPS means long-term equity anticipation securities. These are options having a maturity of upto three years.

Baskets

Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options.

Swaptions

Swaptions are options to buy or sell a swap that will become operative at the expiry of the options.