KARNATAKA STATE OPEN UNIVERSITY

Mukthagangotri, Mysuru-570 006

MBA
(FOURTH SEMESTER)

ELECTIVE : A-FINANCE
International Financial Management

Department of Studies and Research in Management

Course : 23A   Module : 1 to 5

KARNATAKA STATE OPEN UNIVERSITY

MUKTHAGANGOTHRI, MYSURU- 570 006.

DEPARTMENT OF STUDIES AND RESEARCH IN MANAGEMENT

M.B.A IV Semester

ELECTIVE: A-FINANCE

COURSE - 23A

INTERNATIONAL FINANCIAL MANAGEMENT

MODULE - 1 : INTERNATIONAL FINANCIAL ENVIRONMENT

MODULE - 3: FOREIGN EXCHANGE EXPOSURE

MODULE - 4 : FOREIGN EXCHANGE RISK MANAGEMENT

MODULE - 5 : MANAGEMENT OF INTEREST RATE EXPOSURE

Further information may be obtained from the University's office at Mukthagangothri, Mysuru.-6.

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Dear Learner,

It gives me immense pleasure to welcome you to the Department of management to study MBA Second Year (Fourth Semester) in our esteemed university.

I am Extremely happy in placing this study material in your hand. The Department of Studies and Research in Management, Karnataka State Open University is providing you Self Learning Materials (SLM) for all the courses developed by the team of experts drawn from various conventional universities, Open Universities, B-Schools Management institutions and professionals.

This study material explains the most complicated topics in a very simple and user-friendly manner, it starts with the Objectives, explanation of concepts followed by Case study, Notes, Summary, Key Words, Self Assessment Questions and References. It provides more value added information on contemporary issues.

Department has focussed on conceptual learning and on avoiding bulky and prolonged description. Every concept has been explained in the simplest manner. Some complicated concepts have been simplified in the study material, so that the learner can learn easily.

The Department of Management, Karnataka State Open University is offering three electives or specialization. You have already chosen the stream in which you wish to specialize i.e. Finance, Marketing and People Management. Hope you will gain expertise in you field.

The specialization in an MBA is due to business complexities and diversities. The MBA is over 100 years old now. Leading management institutes are trying to come up with new and innovative ways to educate the next generations of business leaders. In an MBA, an elective facilitates learners to plank extra focus on one particular area of interest and tailor their MBA in a different way depending on their background and future goals.

a)   Finance – Finance is one of the most popular specializations of Master of Business Administration (MBA) program. MBA specialization in finance offers, benefits to working professionals in a variety of industries, including commercial and corporate banking, investment services and real estate. MBA in Finance gains you business and financial skills need to work in a number of enterprises. Finance Specialization balances mathematical rigor with management techniques. The finance papers offered by the department builds you as a stock market experts coupled with the knowledge of corporate finance and banking.

b)   Marketing – Marketing has become one of the most desired specialization both by students and employees in recent years. With the shift to digital and online marketing, most businesses now have their own, in-house marketing teams specialized in bringing customers to the company. Prospective students aspiring to demonstrate that they have the potential to become an excellent marketing manager require a broad skill set. Individuals with soft skills, such as communications, tend to grow well in marketing field. Other desired skills for marketing typically include analytical and leadership skills. The department has carefully chosen the papers to impart the above skills in you.

c)   People Management – The ever increasing importance of the individuals in the success of a business, makes an in depth study of human behaviour very crucial. Effective management requires insight over the aspects of human behaviour, which can only be gained through study of the related theories and principles of people management. The department has strived to provide you knowledge on training, change management, labour loss and so on to prepare you to face these soft challenges.

In addition to the study material provided to you, I advise you to go through the books which are suggested in the reference of every unit. Further, I also suggest you to make yourself acquainted by reading newspapers and journals.

Apparently, the curriculum designed by the board of studies helps you to prepare for UGC NET, various state commission examinations and UPSC examinations. With these words I welcome you for the wonderful learning experience of business education.

I wish all the best and good luck in your education and successful management career.

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INTRODUCTION

The financial markets of all the countries across the globe are interrelated and get influenced by each other trends. Hence, it is important to all the firms whether operating in domestic or international markets to understand the international financial environment and markets. An exporter and importer or a dealer with the knowledge of international financial markets, various financial products and strategies can mitigate risk of all the exposures and make profit. A financial manager should be aware of the fact that in addition to all other factors a firm's profitability and growth have also affected by international financial environment.

The entire course 23- A International Financial Management grouped into five modules each module consists of four units, every unit has been structured and described to enable the student to understand the contents easily. Each unit begins with learning objectives, so that learner knows as to what he/she is required to learn from the unit. The study material is mainly supported by good number of examples, charts, illustrations and figures wherever necessary with a view to assist the student to develop a clear understanding of the concept and each unit is concluded with summary followed by key words and self-assessment questions to help in framing a self-feedback on ascertaining the extent of learning. An extensive reference given at the end of the unit will be a good help to learner.

Module – I : INTERNATIONAL FINANCIAL ENVIRONMENT COMPRISES

(1 to 4). This module deals with the introduction to International Financial Management. At the outset, the unit one explains the basic functions of financial market, further the unit briefly explains the evolution of global financial markets and recent developments in global financial markets. The second unit focuses on the interest rates in the global money markets and Balance of payments and the implications of BOP to a firm. The third unit deals with the international monetary fund(IMF) its functions and funding methods, SDR and exchange rate regimes. The fourth unit sheds light on the foreign direct investment, foreign institutional investors and private equity.

Module – II:FOREIGN EXCHANGE MARKET COMPRISES (5 to 8). This module deals with international financial market. In the unit fifth we explained functions and types of foreign exchange transactions wherein we have shed light on the important types foreign exchange transactions, purchase and sale transactions, spot market, forward market, futures market, options market. We then introduced foreign exchange quotations and explained various methods of quotations and forex market. In the unit seven discussed forex market in India, its evolution, currencies traded, physical market, settlement of transactions. In the

unit eight we have explained spot and forward rates, types of settlement under spot transaction, arbitrage, spot quotations, forward transaction, and futures contract.

Module-III : FOREIGN EXCHANGE EXPOSURE CONSIST OF CONSIST (9to 12). This module deals with nature and measurement of foreign exchange exposure and risk. In the unit nine we have explained three types of exposures that is, transaction, translation and economic exposure. The tenth unit defines exchange rate and explains its types and determination of exchange rate, measuring exchange rate movements and theories of exchange rate. In the eleventh unit, we introduced interest parity theory and purchasing power parity theory. In the twelfth unit, we explained the factors influencing exchange rate, exchange rate forecasting.

Module-IV : FOREIGN EXCHANGE RISK MANAGEMENT (13 to 16). Broadly this module deals with managing risk in the international transactions. The unit thirteen explains how to manage all the types of exposures. The unit fourteen deals with hedging strategies for currency risk wherein we explained both the contractual and non- contractual hedges. In the unit fifteen we have introduced various derivative products to manage the risk. They are forwards, futures, swaps and money market operations. The unit sixteen deals with multinational cost of capital and capital structure.

Module-V : MANAGEMENT OF INTEREST RATE EXPOSURE (17 to 20). The module deals with management of interest rate exposures, the unit seventeen deals with international capital budgeting, the unit eighteen focuses on interest rate caps, floors and financial swaps. The unit nineteen explains short- term financial management, centralized and decentralized cash management. The unit twenty deals with transfer pricing and netting, Global Depository Receipts.

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MODULE - I
INTERNATIONAL FINANCIAL ENVIRONMENT

UNIT- 1: GLOBAL FINANCIAL MARKETS AND RECENT DEVELOPMENTS

Structure :

1.0 OBJECTIVES

After studying this unit, you should be able to;

- Understand the basic functions of financial markets

- Know about the of Global Financial Markets

- Be aware about the recent developments in global financial markets

1.1 INTRODUCTION

As a business grow their interest in foreign market may also grow, initially, they may merely attempt to export a product to a particular country or import supplier from a foreign manufacturer. An understanding of International Financial Management is crucial to not only the large MNCs with numerous foreign subsidiaries, but also to the small business engaged in Exporting or Importing. International business is even important to companies that have no intention of engaging in International Business. Which companies must have recognized how their foreign competition will affected by movements in Exchange Rates, Foreign Interest rates, Labour Costs, and Inflation. Such economic characteristics can affect to foreign competitors cost of production and pricing policy. MNCs have significant foreign operation driving a high percentage of their sales overseas financial manages of MNCs must understanding the complexities of International finance so that they can make sound financial and Investment decisionAs you studied in the previous semester the financial markets are those where trading of securities including equities, debentures or bonds, currencies and derivatives occurs. Let us study the basic functions of financial markets.

1.2 BASIC FUNCTIONS OF FINANCIAL MARKETS

1.2.1 Price Setting

The value of an ounce of gold or a share of stock is no more, and no less, then what someone is willing to pay to own it. Markets provide price discovery, a way to determine the relative values of different items, based upon the prices at which individuals are willing to buy and sell them.

1.2.2 Asset salvation

Market prices offer the best way to determine the value of a firm or of the firm's assets or property. This is important not only to those buying and selling businesses, but also to regulators. An insurer, for example, may appear strong if it values the securities

it owns at the prices it paid for them years ago, but the relevant question for judging its solvency is what prices those securities could be sold for if it needed cash to pay claims today.

1.2.3 Arbitrage

In countries with poorly developed financial markets, commodities and currencies may trade at very different prices in different locations. As traders in financial markets attempts to profit from these price differences, hence prices move towards a uniform level, making the entire economy more efficient.

1.2.4 Raising Capital

Firms often require funds for various purposes such as to buy assets, expand its operations, replace machinery. These firms can rise funds by issuing Shares, bonds and other types of financial instruments.

1.2.5 Commercial Transactions

As well as long term capital, the financial markets provide the grease that makes many commercial transactions possible. This includes such things as arranging payment for the sale of a product abroad, and providing working capital so that a firm can pay employees if payments from customers run late.

1.2.6 Investing

The stock, bond and money markets provide an opportunity to earn a return on funds that are not needed immediately, and to accumulate assets that will provide and income in future.

1.2.7 Risk Management

Futures, options and other derivatives contracts can provide protection against many types of risk, such as the possibility that a foreign currency will lose value against the domestic currency before and export payment is received. They also enable the markets to attach a price to risk, allowing firms and individuals to trade risk until they hold only those that they wish to retain.

1.3 INTERNATIONAL FINANCIAL MANAGEMENT

International Financial Management (IFM) deals with financial decisions taken in the area of international business. International business is not new, nor is the study of IFM. But it was, for long, a part of international economics in general. It is only with the fast growing dimensions of international business in the second half of the twentieth century and the growing complexities associated with it that the study of IFM has turned significant enough to become an independent branch of study. IFM covers the study of:

1. Foreign exchange market

2. Exchange rate determination

3. Exchange rate risk and its management

4. MNC's investment decisions

5. International working capital decisions

6. Financing decisions of the MNCs

7. International accounting and taxation

8. International indebtedness

1.4 GLOBAL FINANCIAL MARKETS

"Indian rupee depreciated against US Dollar, The Euro is Slightly Higher Against the Yen. The Dow Jones Industrial Average is off 18 points in active trading. Regulators close a Honk Kong bank after it loses $ 500 m on derivatives trading. Following the Bank of England's decision to lower its base rate, monthly mortgage payments are set to fall."All of these commonplace events are examples of financial markets at work.

That markets exercise enormous influence over modern life comes as no news. But although people around the world speak casually of "wall street"," Sensex", "the bond market", and "the currency market", the meaning they attached to these time worm phrases are often vague and usually out of date.

The last two decades have witnessed the emergence of a vast financial market straddling national boundaries enabling massive cross-border capital flows from those who have surplus funds and are in search or high returns to those seeking low-cost funding. The phenomenon of borrowers, including governments, in one country accessing the financial markets of another is not new; what is new is the degree of mobility of capital,

the global dispersal of the finance industry, and the enormous diversity of markets and instruments which a firm seeking funding can tap.

The decade of eighties ushered in a new phase in the evolution of international financial markets and transactions. Majority countries had begun deregulating and liberalizing their financial markets towards the end of seventies. While the process was far from smooth, the overall trend was in the direction of relaxation of controls which till then had compartmentalized the global financial markets. Exchange and capital controls were gradually removed, non-residents were allowed freer access to national capital markets and foreign banks and financial institutions were permitted to establish their presence in the various national markets. The process of liberalizations and integration continued into the 1990s, with many of the developing countries including India carrying out substantive reforms in their economies and opening up their financial markets to non-resident investors. A series of crises-the Mexican crisis of 1995, the East Asian collapse in 1997 and the Russian meltdown the following year-threatened to stop the process in its tracks but by the end of 1999 some of the damage has been repaired and the trend towards greater-integration of financial markets appears to be continuing.

While opening up of the domestic markets began only around the end of seventies, a truly international financial market had already been born in mid-fifties and gradually grown in size and scope during sixties and seventies. This is the well-known Eurocurrencies Market wherein a borrower (investor) from country A could raise (place) funds in currency of country B from (with) financial institutions located in country C. For instance, an Indian firm could get a US dollar loan from a bank located in London. An Arab oil sheik could deposit his oil dollars with a bank in Paris. This market had performed a useful function during the years following the oil crisis of 1973, viz. recycling the "petrodollars"-accepting dollar deposits from oil exporters and channeling the funds to borrowers in other countries. During the eighties and the first half of nineties, this market grew further in size, geographical scope, and diversity of funding instruments. It is no more a "Euro" market but a part of the general category called "offshore markets".

Alongside liberalization, other qualitative changes have been taking place in the global financial markets, Removal of restrictions led to geographical integration of the major financial markets in the OECD countries. Gradually this trend is spreading to developing countries many of whom have opened up at least partially-to non-resident investors, borrowers and financial institutions. Another noticeable trend is functional integration. The traditional distinctions between different kinds of financial institutions commercial banks, investment banks, finance companies and so on-are giving way to

diversified entities that offer the full range of financial services. The early part of eighties saw the process of disintermediation get under way. Highly rated issuers began approaching the investors directly rather than going through the bank loan route. On the other side, the developing country debt crisis, adoption of capital adequacy norms proposed by the Basle Committee and intense competition, forced commercial banks to realize that their traditional business of accepting deposits and making loans was not enough to guarantee their long-term survival and growth. They began looking for new products and markets. Concurrently, the international financial environment was becoming more and more volatile-the amplitude of fluctuations in interest rates and exchange rates was on the rise. These forces gave rise to innovative forms of funding instruments and tremendous advances in the art and science of risk management. The decade saw increasing activity in and sophistication of financial derivatives markets which had begun emerging in the seventies.

Taken together, these developments have given rise to a globally integrated financial marketplace in which entities in need of short or long-term funding have a much wider choice than before in terms of market segment, maturity, currency of denomination, interest rate basis, and so forth. The same flexibility is available to investors to structure their portfolios in line with their risk-return tradeoffs and expectations regarding interest rates, exchange rates, stock markets and commodity prices. Financial services firms can now design financial products to unique specifications to suit the needs of individual customers.

1.5 DOMESTIC AND OFFSHORE MARKETS

Financial assets and liabilities denominated in a particular currency say the US dollar- are traded primarily in the national financial markets of that country. In addition, in the case of many convertible currencies, they are traded outside the country of that currency. Thus bank deposits, loans, promissory notes, bonds denominated in Indian rupee are bought and sold in the US money and capital markets such as New York as well as the financial markets in London, Paris, Singapore and other centers outside the USA. The former is the domestic market while the latter is the offshore market in that currency. Each of these in turn will have a menu of funding avenues. The Eurocurrencies market is the oldest and largest offshore market.

While it is true that not both markets will offer all the financing options nor that any entity can access nil segments of a particular market, it is generally seen that a given entity has access to both the markets. This rises two important questions, are they then

really two distinct markets or should we view the entire global financial market as a single market? There is no unambiguous answer to this question. On the one hand, since as mentioned above, a given investor or borrower will normally have equal access to both the markets, arbitrage will ensure that they will be closely linked together in terms of costs of funding und returns on assets. On the other hand, they do differ significantly on the regulatory dimension. Major segments of the domestic markets are usually subject to strict supervision and regulation by relevant national authorities such as the SEBI, RBI, and others in India, SEC, Federal Reserve in the US, the Ministry of Finance in Japan, and the Swiss National Bank in Switzerland. These authorities regulate non-resident entities' access to the public capital markets in their countries by laying down eligibility criteria, disclosure and accounting norms, and registration and rating requirements. Domestic banks are also regulated by the concerned monetary authorities and may be subject to reserve requirements, capital adequacy norms and deposit insurance. The offshore markets on the other hand have minimal regulation, often no registration formalities and importance of rating varies. Also, it used to be the case that when a non-resident entity tapped a domestic market, tasks like managing the issue, underwriting and so on, were performed by syndicates of investment banks based in the country of issue and investors were mostly residents of that country.

Firms from emerging market economies (EMEs) considerably stepped up their issuance of bonds in offshore bond markets after the Great Financial Crisis of 2007-09. Taking the advantage of easy external financing conditions and investor appetite for higher yields, many EME firms raised funds through bond issues outside their jurisdiction

Finally, it must be pointed out that though nature of regulation continues to distinguish domestic from offshore markets, almost all domestic markets have segments like private placements, unlisted bonds, and bank loans where regulation tends to be much less strict. Also, recent years have seen emergence of regulatory norms and mechanisms which transcend national boundaries. With removal of barriers and increasing integration, authorities have realized that regulation of financial markets and institutions cannot have narrow national focus-the markets will simply move from one jurisdiction to another. To minimize the probability of systemic crises, banks and other financial institutions must be subject to norms and regulatory provisions that are common across countries

1.6 RECENT DEVELOPMENTS IN GLOBAL FINANCIAL MARKETS

We have witnessed dramatic events in global financial markets, including the Asian crisis, the Russian crisis, and the near-collapse of Long Terms Capital Management (LTCM), which was a highly leveraged hedge fund with enormous trading positions. More recently the European debt crisis, China's economic slowdown and, the great financial crisis 2007-09. Perhaps foremost among recent changes in world financial markets has been their accelerating integration and globalization. This development, which has been fostered by the liberalization of markets, rapid technological progress and major advances in telecommunications, has created new investment and financing opportunities for business and people around the world. Easier access to global financial markets for individuals and corporations will lead to a more efficient allocation of capital, which, in turn, will promote economic growth and prosperity.

The international financial markets witnessed extreme dislocation in the period immediately following the collapse of the Lehman Brothers in mid- September 2008. The volatility in the markets, which peaked by end -2008, moderated somewhat in 2009. Due to the unwinding of carry trade positions and low risk appetite, the yen appreciated against most other currencies, including the US dollar during 2008-09. However, beginning mid-February 2009 up to mid- April 2009, the yen has generally depreciated against the US dollar. Although, the foreign exchange swap spreads have begun to soften, the foreign exchange markets remained strained for most countries during first quarter of 2009. The Bank of Mexico had to directly intervene in the foreign-exchange markets for the first time in more than a decade in February 2009 because of the severity of the impact of the crisis on its currency trading. Four eastern European central banks (of Romania, Hungary, Poland and the Czech Republic) announced that they would make coordinated effort to bolster their currencies as the sharp depreciations experienced by their respective currencies were not in line with the economic fundamentals. The US dollar, generally, appreciated against most of the currencies as the US investors were liquidating their positions in overseas equity and bond markets and repatriating the money back to US. Notwithstanding the deepening of the financial crisis and weakness in economic activity in the US, the flight to safety considerations helped strengthen the US dollar.

During 2008-09, the US dollar appreciated against most major currencies including the euro and the pound sterling. The US dollar, however, depreciated against the Japanese yen, as a result of unwinding of carry trades. Amongst Asian currencies

also US dollar appreciated against Korean won, Thai baht, Malaysian ringgit, Indonesian rupiah and Indian rupee bur depreciated against Chinese yuan. As on April 14, 2009, however, the US dollar depreciated against most major currencies, except the euro and the Japanese yen, over end- March 2009 levels.

Other important factors which affected the global financial markets in the recent time are European debt crisis and Brexit. Britain's vote to leave the European Union- the country's biggest decision in more than a generation – ushered in an era of uncertainty. The country's relationship with mainland Europe may be transformed, as could both Britain and the EU itself. In the immediate aftermath sterling dropped more than 10 per cent against the dollar and UK stocks had their worst fall since the financial crisis, as markets took stock of the decision to leave the EU. The pound continued its slide in subsequent days, hitting its lowest levels against the dollar for over 30 years, despite the UK authorities attempted to provide reassurance.

The recent IMF report finds that short-term risk to global financial stability have abated since April 2016, but that medium-term risks continued to build. Financial institutions in advanced economies face a number of cyclical and structural challenges and need to adapt to low interest rates, as well as to an evolving market and regulatory environment. Weak profitability could erode banks buffers over time and undermine their ability to support growth. A cyclical recovery will not resolve the problem of low profitability. More deep-rooted reforms and systematic management are needed, especially for European banks. The solvency of many life insurance companies and pension funds is threatened by a prolonged period of low interest rates. Corporate leverage in emerging market economies remains elevated in some countries, but the current favorable external environment presents an opportunity for overly indebted firms to restructure their balance sheets. The political conditions.

1.7   NOTES

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1.8   SUMMARY

Financial markets are those where securities such as shares, bonds, currencies are bought and sold. The financial market is considered as the barometer of the economic progress of a country. The financial markets help firms to discover the price for their securities, liquidate the securities, and to manage the risk. A firm which is in to international business fails if it doesn't manage its financial transactions properly. The emergence and liberalization of various regulations across the globe by many countries led to firms to borrow funds from offshore markets and also invest in the offshore markets. Emerging countries companies' securities are also trading across the globe. For example, Infosys shares are trading in New York Stock Exchange (NYSE).The global financial markets have undergone major changes in the recent times, there are so many factors affecting the global financial market such as, the Asian crisis, the recession of 2008-09, the euro debt crisis, Brexit and others.

1.9   KEY WORDS

Financial markets, Exchange rate, offshore market, arbitrage.

1.10   SELF-ASSESSMENT QUESTIONS

1.   What is financial market? What are its functions?

2.   Explain the meaning of the term "offshore market"

3.   Write a note on recent trends in global financial markets.

1.11   REFERENCES

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UNIT-2: INTEREST RATES IN GLOBAL MONEY MARKETS, THE BALANCE OF PAYMENTS-IMPORTANCE AND STRUCTURE

Structure :

2.0 OBJECTIVES

After studying this unit, you should be able to;

- Understand the money market
- Explain the interest rates in the global financial markets and causes for their differences
- Be aware the balance of payment
- Analyze the importance and implications of BOP

2.1 MONEY MARKET

Money market is a market where short funds are available. It can also define as a section of financial market in which high liquid and short maturity securities are bought and sold. A money market is one of the safest financial markets available for currency transactions. It is often used by the big financial institutions, large corporations, and national governments. The investments made in money markets are usually for a very short period of time and therefore they are commonly known as cash investments.

2.2 INTEREST RATES IN THE GLOBAL MONEYMARKETS

The interest rates between domestic and offshore markets on the one hand, on the other hand interest rate for different currencies in the offshore markets are very important for an investor or a borrower. Interest rates are determined by factors such as money growth, real output growth, expected inflation, and required real rate, default risk and market nominal risk free rate of treasury bills. The interest rate on a debt instrument denominated in a specific currency in the Euro currency and Euro bond market is determined by the demand for funds denominated in that currency and the supply for funds available in that currency. In this unit let us examine the linkages between interest rates in the domestic and offshore markets on the one hand and, on the other hand, between interest rates for different currencies in the off-shore market.

In India,MIBOR (Mumbai Interbank Offer Rate) is for Indian inter-bank market, and is calculated on daily basis by National Stock Exchange (NSE), along with Fixed Income Money Market and Derivative Association of India (FIMMDA). It is a weighted average of lending rates of a group of bank(including Public Sector banks, Private Sector Banks, Primary Dealers, Foreign Banks in India, etc.), on funds lent to first-class borrowers (well rated borrowers) MIBOR is published on different timings (e.g., 9:40 A.M., 11:30 A.M. etc), and for several maturity periods (e.g., overnight, 3 days, 2 weeks, 1 month, etc.)

another rate is Mumbai Inter-Bank Bid Rate (MIBID) is the opposite of MIBOR. While MIBOR is the benchmark rate at which banks are willing to offer loans to other bank, MIBID is the benchmark rate at which banks are willing to take loans (paying the MIBID interest rate) from otherat banks. Note that MIBID rate is always less than MIBOR rate, because, banks will try to pay less interest after taking loans, and will try to get more interest while offering loans. It is also the weighted average of interest rates at which several banks (taken as survey) are willing to pay.

Currently FIMMDA and NSE came with a new product, named as 'FIMMDA-NSE MIBID/MIBOR' which acts like the benchmark for the inter-bank market in India (taking both MIBOR and MIBID together)

In the Eurocurrency market, which is primarily an interbank deposit market, the benchmark is provided by the interbank borrowing and lending rates. The most widely known benchmark is the London Interbank Offer Rate abbreviated LIBOR. This is an index of the rate which a "first class" bank in London will charge another first-class bank for a short-term loan. Note that LIBOR is not necessarily the rate charged by any particular bank; it is only an indicator of demand-supply conditions in the interbank deposit market in London. Another rate often referred to is the LIBID-London Inter-Bank Bid Rate, the rate which a bank is willing to pay for deposits accepted from another bank.

Obviously, LIBORwould vary according to the term of the underlying deposit. Thus, financial press normally provides quotations for 3-and-6 month LlBORs. In the Euromarkets, deposits range in maturity from overnight up to one year. LIBOR also varies according to the currency in which the loan or deposit is denominated. We will discuss below the link between LlBORs for different currencies. Boxes 6.1 and 6.2 present selected short-term interest rates for the United Kingdom and the United States money markets respectively. Table 6.2 gives 6-month LlBORS for various currencies.

Table 1.1

Short Term Rates-U K December 2016 (Averages) (% per annum)		Short Term Rates-U S End, December 2016 (% per annum)	
3 -Month T -Bill:	0.3220	Federal Funds	0.54
BOE Repo Rate:	0.4439	3 -Month T -Bill:	0.51
Discount Rate:	4.5300	3 -Month CP:	0.62
3 -Month Bills		Prime Rate:	3.64
3 -Month Interbank:	0.4902		

Table 1.13-Month and 6-Month LlBORs.

(December 31, 2016 in % per annum)

Currency	3-Month LIBOR	6-Month LIBOR
US Dollar	0.94167	1.29100
Japanese Yen	-0.05914	-0.01150
Pound Sterling	0.38450	0.01150
Swiss Franc	-0.75000	-0.67800
Euro	-0.33357	-0.21871

Let us now discuss the relationship between interest rates in the domestic and Euro segments of the money market. Tables 1.1 and 1.2 provide recent data on commercial paper rate in the domestic dollar segment and the 3-month Eurodollar rate. As can be seen the rates are somewhat close and generally move together. Because, arbitrage by borrowers and investors with access to both the markets should serve to keep the rates close together. Why are the rates not identical? Two explanations are offered. The first emphasizes the demand side, viz. investors (depositors) may not regard dollar deposits with banks in the US and banks outside the US as perfect substitutes. If Eurobanks are perceived to be more risky, depositors would demand a risk premium which would force Eurobanks to pay somewhat higher deposit rates. On the other hand, if depositors who are not residents of US might perceive a degree-however small-of political risk in placing their funds in US, Eurobanks can attract deposits even if they pay a somewhat smaller rate of interest. The second explanation emphasizes the supply side. Banks in US are subject to reserve requirements and have to pay insurance premiums for Federal Deposit Insurance. This would mean a higher cost of funds for a given rate paid on deposits. Eurobanks are exempt from both these restrictions and can therefore afford to pay somewhat higher rates. Thus suppose, both pay interest at 10% per annum; assume that reserve requirements in the US are 5% and deposit insurance costs 0.1 % per annum. Then the effective cost of funds for the US bank would be (10 + 0.1)/(1 - 0.05) = 10.63%, while for the Euro bank it is 10%.12 The US bank can pay interest only at the rate of 9.4% to achieve a cost of funds equal to 10%. There may also be a third factor at work though its influence is likely to be small. Depositors outside US may prefer offshore banks on account of the convenience of time zone and greater familiarity with banking practices.

The cost-of-funds arguments would also imply that Eurobanks would charge slightly lower rates on loans than their domestic counterparts since their cost of fund is somewhat lower. In practice, neither argument-risk premium or cost-of- funds-by itself

is adequate to explain the interest differentials at all times. Both have to be invoked depending upon specific market conditions. From time to time, for balance of payments reasons or to defend the exchange rate parity, national authorities may impose temporary controls which result in divided capital markets as arbitrage transactions are not permitted. Under these circumstances the close linkage between domestic and offshore rates is snapped. The most dramatic instance of such segmented credit markets is what happened to the Euro French Franc market in the early eighties when to prevent speculation against the French franc, the authorities imposed various controls on resident and non-resident borrowers and investors and banks. This led to the Euro French franc deposit rates being much higher than corresponding domestic deposit rates.

Why do we have negative rates?

Interest rates are now negative, below zero, for a growing number of borrowers, mainly in the financial markets. Some examples are central bank policies. In the Eurozone, in Denmark, Sweden, Switzerland and Japan, central banks have decided to have a negative rate on commercial banks' excess funds held on deposit at the central bank. In effect, private sector banks have to pay to park their money. In the case of Sweden, the central bank has gone below zero on the rate it lends money to the banks, its main policy tool. The aim in the Eurozone is to stimulate economic growth and to raise inflation, which is also below zero and even further adrift of the European Central Bank's target of below but close to 2%. In Sweden too, it is about raising inflation.

In Denmark and Switzerland the immediate objective has been to prevent the currency rising too much. The idea of lower and negative interest rates is to discourage investors from buying the local currency, which tends to push its value up.

These policy decisions are not the most surprising examples. They are the actions of central banks whose job is to keep inflation under control and to support economic growth and employment. If they judge that their economic policy objectives are best pursued by negative official interest rates, why not?

2.3 BALANCE OF PAYMENTS

Balance of payments (BOP) is a stamen listing receipts and payments in international transitions of a country. It is based on the concept of double-entry book-keeping. The BOP has an important implications on the firms future decisions.

2.3.1 Meaning and importance

All nations prepare and publish statistics about their transactions with the reset of the world. A systematic accounting record of economic transactions with rest of the world is part of its BOP. The balance of payments of a country is a systematic accounting record of all economic transactions during a given period of time between the residents of the country and residents of foreign countries. the economic transaction includes: -

◆ Purchase and sale of goods or services for cash, credit or barter.

◆ An exchange of financial item, purchase and sale of securities etc.

◆ A unilateral gift in kind.

◆ A unilateral financial gift.

Corporate finance managers must monitor BOP data on a regular basis because they have both long term and short-term implications. BOP statements contain useful information about possible future financial decisions of the government. BOP deficits or surplus may have an immediate impact on the exchange rate. It records all transactions that create demand for and supply of a currency. It indicates excess demand or supply of the currency and the possible impact on the exchange rates. It also provides hints about the future trends about inflation interest and a policy shift on the part of the monitory authority of the country. For instant, a country with current account deficit may raise interest rates to attract short-term capital inflow, tighten credit and money supply to curtail inflation and interest rates. BOP accounts are connected with overall savings investment balance of the country. Continuing deficits are surplus may lead to imbalances. Government has to take fiscal and monitory actions to correct the imbalance. It will affect the exchange rate in the country.

2.3.2 Structure of Balance of Payment

Structure of Balance of Payments

		Credits	Debits	Net
A.	Current account			
I.	Merchandise			
II.	Invisible (a+b+c)			
	a. Services			
	i. Travel			
	ii. Transportation			

        iii.   Insurance

        iv.   Miscellaneous

   b.   Transfer

        i.   Official

        ii.   Private

   c.   Income

        i.   Investment income

        ii.   Compensation to employees

Total current account (I+II)

B.   Capital account

   1.   Foreign investment

      a.   In India (direct, portfolio)

      b.   Abroad

   2.   Loans

      a.   External assistance (by India, to India)

      b.   Commercial borrowings (by India, to India)

      c.   Short-term

   3.   Banking capital

      a.   Assets

      b.   Liabilities

      c.   Non – residents deposits

   4.   Rupee debt service

   5.   Other capital

   Total capital account

C.   Errors and omissions

D.   Overall balance of A,B,C

E.   Monitory movements

i.   IMF

ii.   Foreign exchange reserves (increase/ decrease)

2.3.3 Accounting Rules

BOP is subject to all the rules of double entry booking keeping. Total credits must exactly match the total debits. Therefore, the balance of payments must always balance. In the context of BOP the following two rules should understood.

a.   All transactions leading to payment from rest of the world should be recorded as credit. Payment themselves should be recorded as offsetting debit entries. All transactions leading to payments from the country should be recorded as debit and corresponding payment as credit.

Example: Export of 500 $ goods account (export account) credit, claim on a foreign bank debited.

b.   A transaction that results in increase demand for foreign exchange is to be recorded as debit entry, a transaction which results in increase in the supply of foreign exchange is to be recorded as credit entry. Increase in foreign assets reduction in liability uses foreign exchange, a debit entry. A reduction in foreign asset or increase in liability, a source of foreign exchange, is a credit entry. Capital outflow i.e., a resident purchases foreign security, or pace a foreign loan is a debit entry, a capital inflow is a credit entry.

2.4   NOTES

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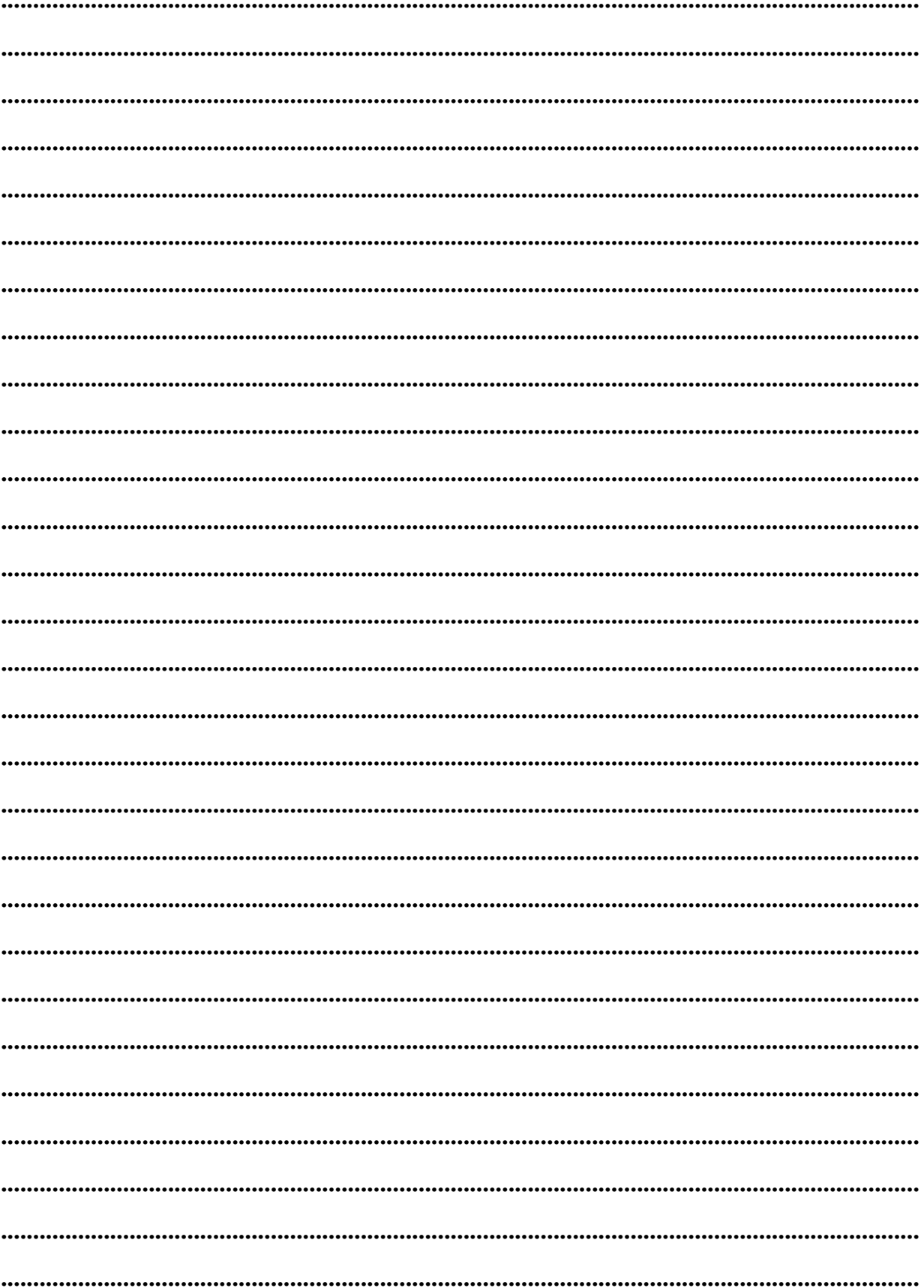
2.5 SUMMARY

Interest rates in the global money market are determined by many factors such as money growth, real output growth, expected inflation, and required real rate, default risk and market nominal risk free rate of treasury bills etc., the interest rates in different money markets are usually be similar with little difference due to the arbitrage. The difference in the interest rates across the different money market are because the domestic investor may expect risk premium on his deposits with the foreign bank in the foreign country while he does not demand such premium on the deposits with the domestic banks within the country and the second reason may be due perceived political risk investor may deposit one country currency with another country bank this makes the interest rates cheaper in the country in which the supply of funds would be more.

The balance of payments of a country is a systematic accounting record of all economic transactions during a given period of time between the residents of the country and residents of foreign countries. The BOP has very important implications for both domestic trading companies and foreign trading companies, for example, the current account deficit may lead to increase in the interest rates in the near future because the current account deficit shows excess imports than exports hence this lead to demand for more foreign currency which depreciates domestic currency value. Therefore, to attract more deposits into the domestic money markets the central bank of the country may increase the inters rates.

2.6 KEY WORDS

Interest, money market, BPO, LIBOR, MIBOR

2.7 SELF-ASSESSMENT QUESTIONS

1.   What is money market?
2.   Why interest rates differ among countries?
3.   What is Balance of Payment (BOP)? Explain its implications to business.

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UNIT-3 : INTERNATIONAL MONETARY SYSTEM- IMF; FUNCTIONS, FUNDING METHODS, SDRs AND EXCHANGE RATE REGIMES

Structure :

3.0 OBJECTIVES

After studying this unit, you should be able to;

- Discuss the objectives and functions of IMF.

- Define Special Drawing Rights

- Explain exchange regimes

3.1 THE INTERNATIONAL MONETARY SYSTEM

International monetary systems are sets of internationally agreed rules, conventions and supporting institutions, that facilitate international trade, cross border investment and generally the reallocation of capital between nation states.

rules and procedures for exchanging national currencies are collectively known as the international monetary system. This system doesn't have a physical presence, like the Federal Reserve System and RBI, nor is it as codified as the Social Security system. Instead, it consists of interlocking rules and procedures and is subject to the foreign exchange market, and therefore to the judgments of currency traders about a currency.

Yet there are rules and procedures—exchange rate policies—which public finance officials of various nations have developed and from time to time modify. There are also physical institutions that oversee the international monetary system, the most important of these being the International Monetary Fund.

3.2 INTERNATIONAL MONETARY FUND

The International Monetary Fundis like a central bank for the world's central banks. It is headquartered in Washington, D.C., has 188 member nations, and cooperates closely with the World Bank, which we discuss in The Global Market and Developing Nations. The IMF has a board of governors consisting of one representative from each member nation. The board of governors elects a 20-member executive board to conduct regular operations.

The goals of the IMF are to promote world trade, stable exchange rates, and orderly correction of balance of payments problems. One important part of this is preventing situations in which a nation devalues its currency purely to promote its exports, for example, if China intentionally devalues its currency Yuan then the china's products in international market would be cheaper, leads to other country products uncompetitive. That kind of devaluation is often considered unfairly competitive if underlying issues, such as poor fiscal and monetary policies, are not addressed by the nation.

3.2.1 Exchange rate policies

In July 1944, representatives from 45 nations met in Bretton Woods, New Hampshire to discuss the recovery of Europe from World War II and to resolve international trade and monetary issues. The resulting Bretton Woods Agreement established the International Bank for Reconstruction and Development (the World Bank) to provide long-term loans to assist Europe's recovery. It also established the International Monetary Fund (IMF) to manage the international monetary system of fixed exchange rates, which was also developed at the conference.

The new monetary system established more stable exchange rates than those of the 1930s, a decade characterized by restrictive trade policies. The IMF article provided for an orderly exchange rate regime. Each member country was to set a fixed value - called the par value- of its currency in terms of gold or the US dollar. It was the par value that determined the rate of exchange between two currencies. Minor fluctuations in the exchange rate within a narrow band of one per cent above and below the established parties could not be ruled out and were to be corrected through active intervention of the monetary authorities of the concerned country.

Any member country could alter the value of its currency or it could devalue its currency in case of "fundamental disequilibrium" in the balance of payments. Changes up to five per cent did not require prior approval of the IMF, but beyond it, IMF's approval was necessary. Fundamental disequilibrium was never formally defined; but in practice, it meant continued and chronic balance of payments problem and colossal loss of reserves. The purpose of this adjustable peg system was, therefore, to establish a balance between the objectives of stable exchange rates and the macroeconomic goals of the countries going for such adjustments as also to help avoid any use of exchange control and trade-restrictive measures.

As again, an important aspect of the Bretton Woods exchange rate system was that the US dollar was convertible into gold at a fixed rate of & 35 per troy ounce of gold. The other currencies were convertible into gold via US dollar. This system remained in place until 1972. In 1972, the Bretton Woods system of pegged exchange rates broke down forever and was replaced by the system of managed floating exchange rates that we have today. Managed floating involves direct or indirect intervention by the monetary authorities of the country to stabilize the exchange rate.

The Bretton Woods system broke down because the dynamics of supply, demand, and prices in a nation affect the true value of its currency, regardless of fixed rate schemes or pegging policies. When those dynamics are not reflected in the foreign exchange

value of the currency, the currency becomes overvalued or undervalued in terms of other currencies. Its price—fixed or otherwise—becomes too high or too low, given the economic fundamentals of the nation and the dynamics of supply, demand, and prices. When this occurs, the flows of international trade and payments are distorted.

In the 1960s, rising costs in the United States made U.S. exports uncompetitive. At the same time, western Europe and Japan emerged from the wreckage of World War II to become productive economies that could compete with the United States. As a result, the U.S. dollar became overvalued under the fixed exchange rate system. This caused a drain on the U.S. gold supply, because foreigners preferred to hold gold rather than overvalued dollars. By 1970, U.S. gold reserves decreased to about $10 billion, a drop of more than 50 percent from the peak of $24 billion in 1949.

In 1971, the U.S. decided to let the dollar float against other currencies so it could find its proper value and imbalances in trade and international funds flows could be corrected. This indeed occurred and evolved into the managed float system of today.

A nation manages the value of its currency by buying or selling it on the foreign exchange market. If a nation's central bank buys its currency, the supply of that currency decreases and the supply of other currencies increases relative to it. This increases the value of its currency.

On the other hand, if a nation's central bank sells its currency, the supply of that currency on the market increases, and the supply of other currencies decreases relative to it. This decreases the value of its currency.

The International Monetary Fund plays a key role in operations that help a nation manage the value of its currency.

3.2.2 Objectives

Article 1 of the Articles of Agreement (AGA) spell out 6 purposes for which the IMF was set up.

These are:

I.   To promote international monetary coope-ration through a permanent institution which provides the machinery for consolation and collaboration on international monetary problems.

II.   To facilitate the expansion and balanced growth of international trade, and to contribute thereby to the promotion and maintenance of high levels of employment and real income and to the development of the productive resources of all members as primary objective of economic policy.

III. To promote exchange stability, to maintain orderly exchange arrangements among members, and to avoid competitive exchange depreciation.

IV. To assist in the establishment of a multila-teral system of payments in respect of current transactions between members and in the elimination of foreign exchange restrictions which hamper the growth of world trade.

V. To give confidence to members by making the general resources of the Fund tempo-rarily available to them under adequate safeguards, thus providing them with the opportunity to correct maladjustments in their balance of payments, without resor-ting to measures destructive of national or international prosperity.

VI. In accordance with the above, to shorten the duration and lessen the degree of dis-equilibrium in the international balance of payments of members.

3.2.3 Functions:

The principal function of the IMF is to super-vise the international monetary system. Several functions are derived from this. These are: granting of credit to member countries in the midst of temporary balance of payments deficits, survei-llance over the monetary and exchange rate policy of member countries, issuing policy recommen-dations. It is to be noted that all these functions of the IMF may be combined into three.

♦ **Regulatory functions:**

The Fund functions as the guardian of a code of rules set by its (AOA— Articles of Agreement).

♦ **Financial functions**

It functions as an agency of providing resources to meet short term and medium term BOP disequilibrium faced by the member countries.

♦ **Consultative functions**

It functions as a centre for international cooperation and a source of counsel and technical assistance to its members.

The main function of the IMF is to provide temporary financial support to its members so that 'fundamental' BOP disequilibrium can be corrected. However, such granting of credit is subject to strict conditionality. The conditionality is a direct consequence of the IMF's surveillance function over the exchange rate policies or adjustment process of members.

The main conditionality clause is the intro-duction of structural reforms. Low income countries drew attraction of the IMF in the early years of 1980s when many of them faced terrible BOP difficulties and severe debt repayment prob-lems. Against this backdrop, the Fund took up 'stabilization programme' as well as 'structural adjustment programme'. Stabilization programme is a demand management issue, while structural programme concentrates on supply management. The IMF insists member countries to implement these programmes to tackle macroeconomic instability.

3.2.4 Organization and Management of the IFM

Like many international organizations, the IMF is run by a Board of Governors, an Exe-cutive Board and an international staff. Every member country delegates a representative (usually heads of central banks or ministers of finance) to the Board of Governors—the top link of the chain of command. It meets once a year and takes decision on fundamental matters such as electing new members or changing quotas.

The Executive Board is entrusted to the management of day-to-day policy decisions. The Board comprises 24 executive directors who supervise the implementation of policies set by the member governments through the Board of Governors.

The IMF is headed by the Managing Director who is elected by the Executive Board for a 5 year term of office.

Rights and obligations, i.e., the balance of Powers in the Fund is determined by a system of quotas. Quotas are decided by a vote of the Board of Governors. Quotas or subscriptions roughly reflect the importance of members in the world economy. It is the quota on which payment obligation, credit facilities, and voting rights of members are determined.

3.2.5 Financial Structure of IFM

The capital or the resources of the Fund come from two sources:

(i) Subscription or quota of the member nations, and

(ii) Borrowings.

Each member country is required to subscribe an amount equivalent to its quota. It is the quota on which payment obligations, credit facilities, and voting right of members are determined. As soon as a country joins the Fund, it is assigned a quota which is expressed in Special Drawing Rights (SDRs). At the time of formation of the IMF, the quota of each member was made up of 25 p.c. in gold or 10 p.c. of its net official holdings of gold and US dollars (whichever was less). Now this has been revised.

The capital subscriptions or quota is now made up of 25 p.c. of its quota in SDRs or widely accepted currencies (such as the US dollar, euro, the yen or the pound sterling) instead of gold and 75 p.c. in country's own currency. The size of the Fund equals the sum of the subscriptions of members. Total quotas at the end-August 2008 were SDR 217.4 billion (about $341 billion).

The Fund is authorized to borrow in special circumstances if its own resources prove to be insufficient. It sells gold to member countries to replenish currency holdings. It is entitled to borrow even from international capital market. Though the Articles of Agreement permit the Fund to borrow from the private capital market, till today no such use has been made by the IMF.

3.2.6 Instruments of IFM lending and loan conditionality

The IMF Articles of Agreement clearly state that the resources of the Fund are to be used to give temporary assistance to members in financing BOP deficit on current account. Of course, the financial assistance provided by the Fund is loan. The following technique is employed: If a country calls on the Fund it buys foreign currencies from the IMF in return for the equivalent in the domestic currency.

This, in legal and technical terms, is called a 'drawing' on the Fund. The technique, therefore, suggests that the IMF does not lend, but sells the required currency to the members on certain terms. This unique financial structure of the Fund clearly suggests that the Fund's resources cannot be lent for long time. It is meant to cover short run gaps in BOP.

The IMF's unique financial structure does not allow any member to enjoy financial assistance over a long time period. The total amount that a country is entitled to draw is determined by the amount of its quota. A member is entitled to draw an amount not exceeding 25 p.c. of its quota. The first 25 p.c. called the 'gold tranche' ('tranche' a French Word meaning slice) or 'reserve tranche' can easily be drawn by countries with BOP problems.

This 25 p.c. of the quota is the members' owned reserves and therefore no conditions are attached to such drawings. This may be called 'ordinary, drawing rights; even the Fund cannot deny its use. However, no interest for the first credit tranche is required to be paid though such drawings are subject to repayment within 3-5 years period.

The 'credit tranche' of 100 p.c. each equalling 25 p.c. of a member's quota are also available subject to the IMF approval and hence, 'conditional'.

Originally, it was possible to borrow equal to 125 p.c. of one's quota. At present, borrowing limit has been raised to 450 p.c. of one's quota which must be redeemed within five years.

Borrowing methods used by the fund are:

i) Stand- by arrangement:

This method of borrowing has become the most normal form of assistance by the Fund. Under this form of borro-wing, a member state obtains the assurance of the Fund that, usually over 12-18 months, requests for drawings of foreign exchange (i.e., to meet short- term BOP problems) up to a certain amount will be allowed if the country concerned wishes.

However, the stand-by arrangements can be extended up to 3 years while repayments are required to be made within 3-5 years of each drawing. The term "stand-by" here means that, subject to conditionality, a member has a right to draw the money made available, if needed. In most cases, the member does, in fact, draw.

ii) Extended Fund Facility (EFF)

Stand-by arrangements to stabilise a member's BOP run usually for a period of 12-18 months. Developing countries suffer from chronic BOP problems which could not be remedied in the short run. Such protracted BOP difficulties experienced by the LDCs were the result of structural imbalances in production and trade. It then necessitated an adjust-ment programme and redemption scheme of longer duration.

In the 1970s, the Fund recognized this idea and built up the EFF in 1974. The EFF is designed to provide assistance to members to meet their BOP deficits for longer period (3-4 years) and in amounts larger in relation to their quotas. Repayment provisions of EFF cover a period of 4-10 years. However, conditions for granting loans are very stringent. Drawings on this account since 2000 stand at over 50 billion dollars in SDRs.

iii) Compensatory Financing Facility (CFF):

Apart from the ordinary drawing rights, there are some 'special finances' windows to assist the developing countries to tide over BOP difficulties. CFF, introduced in 1963, is one such special drawing provision. Its name was changed to Com-pensatory and Contingency Financing Facility (CCFF) in 1980, but the 'contingency' was dropped in 2000. Under it, members were allowed to draw up to 25 p.c. of its quota when CFF was introduced.

It can now draw up to 45 p.c. Since the mid- 1990s, this has been the least-used facility.

iv)   Structural Adjustment Facility (SAF) and Enhanced SAF (ESAF)

In 1986 a new facility—the SAF—was introduced for the benefit of low income countries. It was increasingly realised that the so-called stringent and inflexible credit arrangements were too inadequate to cope with the growing debt problems of the poorest members of the Fund. In view of this, SAF was introduced which stood quite apart from the monetary character of the Fund.

Under it, credit facilities for economic reform programmes are available at a low interest rate of 0.5 p. c compared to 6 p.c. for most Fund facilities. Loans are for 10 years with a grace period of five and a half years. LDCs facing protracted BOP problems can get assistance under SAF provided they agree to undertake medium-term structural adjustment programmes to foster economic growth and improve BOP conditions. An extended version of SAF—ESAF—was introduced in 1987. The ESAF has been replaced by a new facility, called Poverty Reduction and Growth Facility in 1999.

What emerges from the structural adjustment facility is that the IMF's loan is now available to member countries in support of policy progra-mmes. It now insists on the supply side policy 'as a condition' for assistance, in addition to loans meant for short-term BOP difficulties.

v)   Poverty Reduction and Growth Facility(PRGF):

The PRGF that replaced the ESAF in November 1999 provides concessional lending to help the poorest member countries with the aim of making poverty reduction and economic growth —the central objectives of policy programmes. Under this facility, low-income member countries are eligible to borrow up to 140 p.c. of its quota for a 3-year period. Rate of interest that is charged is only 0.5 p. c and repayment period covers 5 1/2-10 years, after disbursement of such facility. However, financial assistance under this facility is, of course, 'conditional'.

vi)   Supplimental Reserve Facility (SRF)

This instrument provides additional short-term financing to member countries facing exceptional BOP difficulties because of a sudden and disruptive loss of market confidence reflected in capital outflows of countries concerned. Consequent upon the eruption of East Asian financial crisis, the SRF was introduced in 1997.

Till date (March, 2012), the top three largest borrowing nations are Greece, Portugal and Ireland from the IMF.ntCondit

3.2.7 Stringent Conditionality

It is to be remem-bered here that the IMF lending is conditional. Further, the IMF lending is temporary ranging from 1 year to 3 years. Repayment period varies from country to country and from one facility to another. Repayment under PRGF for low income countries is 10 years with a 5 1/2 year grace period on principal payments.

The IMF may be viewed as both a financing and an adjustment-oriented international institution for the benefit of its members. The distinguishing features of the Fund loans are their cost and certain macroeconomic policy conditions. These conditionality requirements range from rather general commitments to cooperate with the IMF in setting policies to formulating a specific, quantified plan for monetary, trade, and fiscal policies.

The IMF practice of tying loans to conditions reflects the dominant influence of the capitalist world. The strings of conditionality's as well as the policy of sanctions that came to the fore in the early 1960s made this international organization the most controversial institution. This is because of the fact that the conditions set by the Fund cannot constitute a standard solution for deficit countries to the Fund's finances. By attaching conditions to credit facilities, the Fund has assumed the role of a 'neo-colonist'. Some say that the IMF has been acting as 'a rubber stamp for the desires of the US administration'.

The conditionality is always intended to restore internal and external balance and price stability. While formulating specific performance criteria (often referred to as 'conditional loans' that is, 'at the point of a gun'), the Fund prepares 'stabilization' programme and 'adjustment' programme which member states will be required to adopt to tackle macroeconomic instability.

The programme design involves monetary and fiscal policy measures so that structural adjustment (i.e., reforms aimed at changing the structure of both production and consumption) takes place. Stabilization is generally regarded as a precondition of structural adjustment policies'.

Thus, stabilization and structural programmes not only includes monetary and fiscal policies but also exchange rate policy (i.e., devaluation), liberalization or deregulation, privatization, reforming institutions to carry governments' new role, freeing markets to determine prices, reforming the labour sector. Almost all stabilization programmes intend to curb effective demand.

3.3 SPECIAL DRAWING RIGHTS (SDRs)

The Special Drawing Rights (SDRs) as an international reserve asset or reserve money in the international monetary system was established in 1969 with the objective of alleviating the problem of international liquidity. The IMF has two accounts of operation—the General Account and the Special Drawing Account. The former account uses national currencies to conduct all business of the fund, while the second account is transacted by the SDRs. The SDR is defined as a composite of five currencies.

Member nations maintain funds in the form of currency reserve units called Special Drawing Rights (SDRs) on deposit with the IMF. From 1974 to 1980, the value of SDRs was based on the currencies of 16 leading trading nations. Since 1980, it has been based on the currencies of the five largest exporting nations. As of 01 October, 2016, these were the U.S. dollar, euro, the Chinese renminbi (RBM, "renminbi" is the official name of the currency introduced by the Communist people's Republic of China at the time of its foundation in 1949. The "Yuan" is the name of a unit of the renminbi currency), Japanese yen, and Great Britain's pound sterling. The value of SDRs is reassigned every five years.

SDRs are held in the accounts of IMF nations in proportion to their contribution to the fund. (The United States is the largest contributor, accounting for about 25 percent of the fund.) Participating nations agree to accept SDRs in exchange for reserve currencies—that is, foreign exchange currencies—in settling international accounts. All IMF accounting is done in SDRs, and commercial banks accept SDR-denominated deposits. By using SDRs as the unit of value, the IMF simplifies its own and its member nations' payment and accounting procedures.

In addition to maintaining the system of SDRs and promoting international liquidity, the IMF monitors worldwide economic developments, and provides policy advice, loans, and technical assistance in situations like the following:

- After the collapse of the Soviet Union, the IMF helped Russia, the Baltic states, and other former Soviet countries set up treasury systems to assist them in moving from planned to market-based economies.

- During the Asian financial crisis of 1997 and 1998, the IMF helped Korea to bolster its reserves. The IMF pledged $21 billion to help Korea reform its economy, restructure its financial and corporate sectors, and recover from recession.

- In 2000, the IMF Executive Board urged the Japanese government to stimulate growth by keeping interest rates low, encouraging bank restructuring, and promoting deregulation.

- In October 2000, the IMF approved a $52 million loan for Kenya to help it deal with severe drought. This was part of a three-year $193 million loan under an IMF lending program for low-income nations.

Most economists judge the current international monetary system a success. It permits market forces and national economic performance to determine the value of foreign currencies, yet enables nations to maintain orderly foreign exchange markets by cooperating through the IMF.

The EU and The Euro

The biggest news on the foreign currency front over the past few years is the adoption of the euro by the European Union (EU). Twelve member states of the EU use the euro instead of their old local currencies: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain.

Nations that adopt the euro participate in a single EU monetary policy and are subject to fiscal guidelines requiring them to keep deficits to a certain level and to balance their federal budgets by 2006. Although it will reconsider the matter again, Britain has refused to adopt the euro and has stuck with the pound sterling. This reflects England's traditional sense of "apartness" from continental Europe and its reluctance to give up sovereignty over its economic policies.

3.4   EXCHANGE RATE REGIMES

An exchange rate is the value of one currency in terms of another. The term exchange rate regime refers to the mechanism, procedures and institutional framework for determining the exchange rates at a point of time. Broadly there are three categories of exchange regimes: -

a.   A perfect fixed exchange rate.

b.   A perfect flexible floating exchange rate.

c.   A hybrid with varying degrees of limited flexibility.

A brief history of exchange rate regimes

a.   The gold standard

The oldest system was, the gold standard, was in operation till the first World War. Next came the gold species standard wherein circulations consist of gold coins with fixed gold content. In a version called gold bullion standard the central bank of the country issued paper notes, standing ready to covert on demand paper currency into gold at a fixed conversion ratio. Finally, under the gold exchange standard the paper currency of a country, agreed to convert the currency of another country that is operating the gold bullion standard. The exchange rate of any pair of currency was determined by their respective exchange rate against gold. Money supply was tied to the amount of gold the monetary authorities have in reserve. They must allow free flows of gold between countries and gold standard. Thus, the gold standard regime imposes very rigid discipline on the policy makers.

b.   The Brettowoods system

After the second World War Brettonwoods system came into existence. The exchange rate regime under this system is known as gold exchange standard. The U.S. government undertook to convert the dollar into gold at $35/ounce. Other countries agreed to fix their currencies against dollar with 01% variation.If the exchange rate crossed the limit of one per cent, the monetary authorities of that country were obliged to defend by buying or selling the dollar. IMF agreed to provide credit facilities to carry out the invention in the currency market. Under this system, U.S. dollar became international money. Other countries had to accumulate dollar balances. The system depended on the U.S. deficit of BOP, and other countries running surpluses this system failed in 1973 because of wide fluctuations in exchange rates due to oil prices crisis.

c.   The current scenario

At present nations are following eight different types of exchange rate regimes. They are, currency board agreements, fixed peg arrangements, pegged exchange rates, managed floats, independent floats ect. The present system permits countries to adopt whatever the exchange rate policy they wish. The present system has been called a non0 system, as there are no clear stets off exchange rate arrangements among the major national currencies.

Fixed Vs. Floating rates

The fixed versus floating exchange rate controversy is at least four decades old. Some economists like Milton Friedman, Harry Johnson and Sohnen had advocated floating exchange rate but the experience with floating rates during 70s and 80s has shown that the claims made in there are exaggerated. There are ma y arguments for and against fixed and floating rates. They are as follows:-

a.   The case for fixed exchange rates;

There are some positive arguments in favor of fixed exchange rates and there are arguments against floating exchange rates. The arguments against floating rates are not necessarily arguments in favor of fixed rates. They may well constitute arguments for some degree of exchange rate managements rather than for fixed parities. In this spirit let us consider both the positive arguments in favor of fixed rate and the arguments against floating rates.

♦   Fixed exchange rates with less fluctuation uncertainty and risk promote international trade and investment.

♦   Fixed exchange rates provide discipline for macroeconomic policies.

♦   Fixed exchange rates promote international cooperation and more stable environment among nations.

♦   Speculation under floating rates is likely to be destabilizing.

b.   The case for floating exchange rate;

The case for floating rates is a mixture of positive arguments in favor of floating rates and arguments against fixed exchange rates.

•   Floating exchange rates ensures balance of payment equilibrium because the exchange rate automatically adjust to the demand supply of the currency.

•   Floating rate ensures monetary autonomy.

•   Floating exchange rate insulate economies because the rate moves roughly with the purchasing power parity(PPP).

•   Floating exchange rate promote economic stability because the adjust in response to shock in economy than fix them and force the adjustment onto other economic variables.

Optimal exchange rate regime

An optimal exchange rate regime should achieve the following three policy goals:

♦   A stable exchange rate

♦   A financial integration with the global financial system i.e., a open capital account

♦   Freedom to conduct an independent monetary policy.

Of these three policies, one and two can be achieved with a currency union or board, two and three can be achieved by floating exchange rate and one and three can be achieved with fixedexchange rate. No exchange rate presently can achieve all the three. Therefore, it is called an impossible trinity.

Full capital control

Monetary independence

Exchange rate stability

Integration with global
financial markets
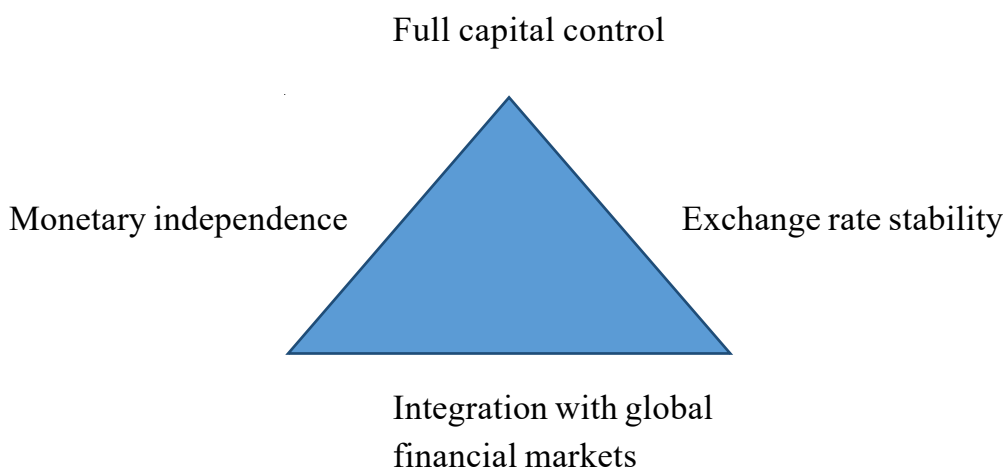
there is no consensus among the concerned people as to the ideal exchange rate regime. It is very difficult sort out the effects of exchange rate fluctuations on the world economy from other shocks, such as oil price, wars, debt crisis, etc. Attempts are being made to devise equilibrium real effective exchange rate. It is a kind of purchasing power of currency's exchange rate against group currencies.

3.5 CASE STUDY

Suppose at present Indian rupee is appreciating against U.S. dollar. It is 67.07/ US$. Exporters are worried and importers are happy. There are three options for government;

i.   To continue the policy of sterilized intervention by RBI by issuing market stabilization scheme bonds.

ii.   Increase capital controls by banning participatory notes by FII's and external commercial borrowing by companies.

iii.   Ignore exporters allow rupee to appreciate and focus on augmenting better infrastructure and labor loss.

Give your arguments.

3.6 NOTES

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3.7   SUMMARY

International Monetary fund (IMF) was established with an objective to promote world trade, stable exchange rates, and orderly correction of BOP problems, still these objectives are completely achieved.

Various exchange rate regimes ranging from fixed, floating currency unions have tried a perfect regime is yet to arrive. With increase in capital mobility and immense technological innovation, the system has acquired its own dynamics that occasionally leads to crisis and panics.

3.8   KEY WORDS

Exchange rate, fixed rate, floating rate, SDRs.

3.9   SELF-ASSESSMENT QUESTIONS

1.   What are the objectives and functions of IMF?

2.   Discuss the merits and demerits of fixed and floating rate regimes.

3.   Is there any optimal exchange rate regime? Discuss.

4.   Write a note on SDRs.

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UNIT-4 : FOREIGN DIRECT INVESTMENT, FOREIGN INSTITUTIONAL INVESTORS AND PRIVATE EQUITY

Structure :

4.0 OBJECTIVE

After studying this unit, you should be able to;

- explain types of foreign investment
- discuss the cost of benefits of FDI
- explain the FIIs
- difine private equity

4.1 INTRODUCTION

The economic growth a country largely influence by the investments in various sectors. The investment either long term or short term may come from within the country or from foreign country. After economic liberalization, since1980s all most all the countries in the world have removed barriers to inflow of foreign capital and trying attract the foreign investment. The China, India and other Asian countries are recent examples how the foreign capital contributed to their economic growth.

4.2 TYPES OF FOREIGN INVESTMENT

Broadly, there are two types of foreign investment namely,

i.   Foreign Direct Investment (FDI) and

ii.   Foreign Portfolio Investment (FII).

FDI refers to an investment made by a company or individual in one country in business interest in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company.

If the investor has only a sort of property interesting the capital in buying equities, bonds or other securities abroad, it is referred to as portfolio investment. That is, in case of portfolio investments, the investor uses his capital in order to get a return of it, has no much control over the use of the capital.

FDI are governed by long-term considerations because these investments cannot be eastly Liquidate. Hence, factors like long term political stability, government policy, industrial and economic prospects etc. influence the FDI decision, However, portfolio investment, which can be easily liquidated are influenced by short term gains. Portfolio investments are generally much more sensitive than FDIs. Direct investors have direct

responsibility with the promotion and management of the enterprise. Portfolio investors do not have such involvement with the promotion and management.

Since the economic liberalization of 1991, there has been a surge in the FDI and portfolio investment in India.

There are mainly two routes of portfolio investments in India, Viz., by Foreign Institutional Investors (FIIs) like mutual funds and through Global Depository Receipts (GDRs), American Depository Receipts (ADRs) and Foreign Currency Convertible Bonds (FCCBs).

4.3   COSTS AND BENEFITS OF FDI

When direct investment flows from one country to another, it creates benefits both for the home country and the host country. At the same time, it involves some costs too. Thus, when a firm decides to make FDI, it takes into account the benefits and costs to be accrued to not only its home country but also to the host country.

4.3.1 Befits to the host country

i.   Availability of scarce factors of production

FDI helps attain proper balance among different factors of production through the supply of scarce factors and fosters the pace of economic development. FDI brings in capital and supplements the domestic capital. This is a significant contribution where the domestic savings rate is too low to match the warranted rate of investment. It brings in scarce foreign exchange that activates the domestic savings that would not have been put into investment in absence of the availability of foreign exchange. It happens when the investment outlay possesses foreign exchange component, and in absence of foreign exchange, domestic savings remain idle. It also happens when the local investors are afraid of the large risk involved in the investment project. In case of FDI, foreign investors share the risk and the investment project is implemented.

Sometimes FDI is accompanied by labour force that performs those jobs that the local labour force is either not willing to do or is incapable of doing on account of lack of skill. Also, foreign investors make available raw materials and improved technology. Raw material is normally no a very important consideration for the host country, but this factor becomes significant in a situation where some vital raw materials is concerned.

ii.   Improvement in the balance of payments

FDI helps improve the balance of payments of the host country. The inflow of investment is credited to the capital account. At the same time, the current account improves because FDI helps either import substitution or export promotion. The host country is able to produce those items that were being imported earlier. It is also able to augment export because the foreign investors bring in knowledge of exporting mechanics and of foreign markets. They bring in improved technology to produce goods of international standard at lower cost. They possess a world-reputed brand name that is helpful in promoting export. They are also more capable of availing of export credits from the cheapest source in the international financial market.

iii.   Building of economic and social infrastructure

When the foreign investors invest in sectors such as basic economic infrastructure, social infrastructure, financial markets and the marketing system, the host country is able to develop a support system that is necessary for rapid industrialization. Even if there is no investment in these sectors, the very presence of foreign investors in the host country creates a multiplier effect and the support system develops automatically.

iv.   Fostering of economic linkages

Foreign firms have forward and backward linkages. They make demand for various inputs that in turn helps develop the input-supplying industries. They employ labour force and so help raise the income of the employed people that in turns raises the demand and industrial production in the country. They make available quality goods of a large variety normally at a competitive price and thus help improve the living standard of the consumers. They train the labour force that creates a pool of trained personnel in the country.

V. Strengthening of government budget

The foreign firms are a source of tax income for the government, They pay not only income tax, but tariff on their import as well. At the same, time, they help reduce the governmental expenditure requirements through supplementing the government's investment activities. All this eases the burden on the national budget.

4.3.2 Benefits for the Home Country

FDI benefits the home country too. the country gets a supply of necessary raw material if the investor makes investment in the exploration for particular raw material. The balance of payments improves insofar as the parent company gets dividend, royalty, technical service fees and other payments, and from the rising export of the parent company to the subsidiary. If FDI takes place in order to develop a vertical set-up abroad,

the export is quite significant. When personnel accompany the investment, it results in greater employment of the nationals. The parent company makes an entry into new financial markets through investment abroad. What is more, the government of the home country generates revenue through taxing the dividend and other earnings of the parent company. There is revenue also from imposing tariff on the import of the parent company from its subsidiary abroad. Again, since FDI is a complement to foreign aid, it helps develop closer political ties between the borne country and the host country which is beneficial for both the countries.

4.3.3 Cost to the Host Country

It is a fact that the inflow of foreign investment helps improve the balance of payments, but the outflow on account of imports and the payments of dividend, technical service fees, royalty, etc. deteriorate the balance of payments. There are evidences to prove that such outflows have exceeded the investment inflows in some years in India (Sharan, 1978). This is not only the case of balance of payments. Raw materials are exploited keeping in view the interest of the home country that is sometimes detrimental to the interest of the host country. Again, the parent company supplies technology to the subsidiary, but normally does not disseminate it to the host market. The result is that the host country remains dependent on the home country for the technology that is often received at an exorbitant price. Sometimes the technology is inappropriate for the local environment and in that case, the loss to the host country is substantial.

As far as employment of locals is concerned, the MNCs normally show reluctance to train the local people. Technology being normally capital – intensive does not assure large employment. Sometimes, the manufacturing process followed by the foreign investors do not abide by the pollution norms or by norms regarding optimal use of the natural resources or the norms regarding location of industries. All this is not in the host country's interest.

The foreign investors are generally more powerful and the domestic industrialists do not compete with them with the result that the domestic industry fails to grow. The foreign companies charge higher prices for their products in view of their oligopolistic position in the market. The higher prices hamper the interest of the consumers as well as lead to inflationary pressure. The foreign companies infuse foreign culture in to industrial set-up and also into the society. Sometimes they are so powerful that they are even able to subvert the government.

4.3.4 Cost to the home country

The cost accruing to the home country is only little. However, it cannot be denied that making of investment abroad takes away capital, skilled manpower and managerial professionals from the country. Sometimes the out flow of these factors of production is so large that it hampers the home country's interest. This is not all. The MNCs operate in different countries in order to maximize their overall profit. To this end, they adopt various techniques that may not be in the interest of the host country. This leads to a tussle between the host government and home government which may have a deleterious effect on bilateral relations.

FDI does possess bright features, but at the same time, it has dark spots too and is not an unmixed blessing. Global benefit can be achieved only if it is carefully handled.

4.4   MODE OF INVESTMENT

The mode of investment broad is one of the most crucial strategies. If the mode is not suitable, the investment cannot be a viable venture. However, it may be noted that selection of a particular mode does not depend solely on the wishes of the investing company, but also upon the economic and political environment in the host country. If the host government does not allow a particular mode, the investing company cannot adopt it even if it is the most suitable for it. The most common modes of investment are:

♦   Operation through branches

♦   Foreign collaboration

i.   Financial collaboration

   a.   Wholly-owned subsidiary

   b.   Subsidiary

   c.   Affiliate

ii.   Technical collaboration

   a.   Franchise

   b.   Turn-key projects

   c.   Management contract

◆ *Merger and acquisitions*

i. Horizontal

ii. Vertical and

iii. conglomerate

4.5 FACTORS AFFECTING INTERNATIONAL INVESTMENT

1. **Rate of Interest:**

Generally, investors invest their funds where the interest rates are more. In the international financial markets one of the important reason for the movement of capital across the countries is interest rate differentials prevailing at different places.

2. **Speculation:**

Short-term capital movements may be influenced also by speculation pertaining to anticipated changes in the interest rates or foreign exchanges rates.

3. **Profitability:**

It common tendency, the investors invest their funds where the return on investment is higher.

4. **Costs of Production:**

Private capital movements are encouraged by lower costs of production in foreign countries.

5. **Economic Conditions:**

The general economic conditions of a nation, particularly the market potential and infrastructural facilities, influence private foreign investment. The size of the population and the income level of a country have an impact bearing on the market opportunities.

6. **Government policies:**

Government policies, particularly towards foreign investment, foreign collaboration, remittances, profit, taxation, foreign exchange control, tariffs, and monetary, fiscal and other incentives, are important factors that may influence foreign investment in a country.

7. **Political factors:**

Political factors like political stability, nature of important political parties and relations with other countries also influence capital movements.

4.6   FDI DIRECTIONAL TRENDS

The major chunk of the FDI flows take place between the developed Countries. For nearly three decades till the early 1990s, about three-quarters of the FDI have gone to the developed countries. Nearly two-thirds of the flows take place between the countries of the *Triad-* the US, the European Union and Japan. The share of developed countries in the FDI inflows and outflows declined in the recent years.

FDI is concentrated in a handful of countries – about a dozen countries received nearly three-fourth of the global FDI flows. A higher degree of concentration is observed in respect of FDI flows to the developing world. In 2014, for example, China and Hong Kong alone received about 32 per cent of the inflows to developing economies.

More importantly, there are no signs that the concentration of international production across countries has been declining over time. However, in many least developed countries that have received only small amounts of FDI, such investment is important *vis-à-vis* the size of domestic investment. What remains a challenge for these countries is the ability to attract not only more, but also higher quality FDI – broadly defined as investment with strong links to the domestic economy, export orientation, advanced technology and skill or spillover effects.

The largest recipient of FDI has either been the UK or US. The US has been the largest foreign investor too. France has been one of the largest foreign investors. While UK also has been experiencing largest FDI outflows, it has been much lower than the inflow to UK.

As Table 39.1 shows the share of developing countries in FDI has been fluctuating FDI flows, by region, 2013–2015 (Billions of dollars).

Country Grouping	FDI Inflows			FDI outflows		
	2013	2014	2015	2013	2014	2015
Developed Economies	680	522	962	826	801	1 065
Developing Economies	662	698	765	409	446	378
Transition Economies	85	56	35	76	72	31
Source: UNCTAD, World Investment Report, 2016.						

4.7 IMPORTANT TRENDS IN FDI INFLOWS TO DEVELOPING COUNTRIES

The share of the FDI going to the developing countries declined substantially from 25 per cent during 1980 – 85 to 17 per cent during 1986 -90. There was, however, an increase in the absolute amount of FDI flows to the developing countries. The economic liberalizations in the developing countries have helped increase the FDI to them. During 2003-06, the share of developing countries in the global FDI inflow ranged between 26 and 39 per cent. In recent years, their share was more than half of the total. In 2014, 10 developing countries were among the top 20 recipients of FDI, compared to 7 countries in 2009. Even while the level of FDI inflows to developing countries rise, the fluctuations in the FDI flows to developed economies affect the share of developing countries.

Within the group of developing countries, the relatively developed among them get the lion's share of the FDI. Very little FDI has taken place in low income economies leaving exceptions like China and India. In most cases, this has been due to the small size of the domestic market and other adverse factors like poor infrastructure, lack of skilled labour etc.,

One traditional attraction of foreign investment, viz., cheap labour, is becoming less important, foreign investment today is not merely for exploitation of local resources. Foreign companies today evaluate the market potential and production and related facilities and their efficiencies, *inter alia,* for investment decision – making. Countries with large and growing markets, fairly developed infrastructures and efficient input supplies, conducive trade policies, favourable political environment, required type of manpower supplies etc. rank high for investment. An encouraging government policy alone is not sufficient. China has been able to attract huge FDI because its economic growth for quite some time now has been very good, it is one of the largest potential markets in the world, because of statist policy of until recently it is virtually a virgin market for many products, the labour force is 'disciplined' by the State and China has favourable political and bureaucratic environment. FDI flows to India have, however, been discouraged by such certain multinationals etc. and bureaucratic problems. It may be recalled that the Motorola, disgusted by the administrative delays, has shifted to China a significant project originally earmarked for India. Countries which are at very low levels of development would not be attractive to foreign investors due to factors like constraints of domestic markets and absence of infrastructural and other input supplies of the quantity and quality needed to make the enterprises competitive.

4.8   OUTWARD FDI FROM DEVELOPING COUNTRIES

FDI outflows from developing economies have been significantly increasing, reflecting the recognition of firms that in a globalizing world economy, they need a portfolio of local assets to be competitive internationally. In fact, countries like Malaysia, the Republic of Korea and Singapore already have an established track record and some others such as Chile, Mexico and South Africa have become players relatively recently. Countries like Brazil, China and India are at the take-off stage. Their investments span all sectors and country groups and involve complex as well as simple industries. Annual FDI outflows from developing countries have grown very faster since the early 1990s. outward FDI from developing countries increased from about 16 per cent of the world total in 2007 to 39 per cent in 2014. In 2014, nine of the top 20 international investors were developing countries, compared to six in 2013.

4.9   FOREIGN INVESTMENT IN INDIA

The flow of direct foreign investment to India has been comparatively limited because of the type of industrial development strategy and very cautious foreign investment policy followed direct foreign investment (private) in India was adversely affected by the following factors.

1. The public sector was assigned a monopoly or dominant position in the most important industries and, therefore, the scope of private investment, both domestic and foreign.

2. When public sector enterprises needed foreign technology or investment, there was a marked performance for the foreign government sources.

3. Government policy towards foreign capital was very selective . foreign investment was normally permitted only in high technology industries in priority areas and export – oriented industries.

4. Foreign equity participation was normally subject to a ceding or 40 per cent, although exceptions were allowed on merit.

5. Payment of dividends abroad, repatriation of capital, etc., as well as inward remittances were subject to stringent laws like the Foreign Exchange Regulation Act (FERA) 1973. These discouraged foreign investment.

6.   Corporate taxation was high and tax laws and procedures were complex.

7. These factors either limited the scope of or discouraged the foreign investment in India.

4.10 FIIs INVESTMENTS

As you know, Foreign institutional investors (FIIs) are those institutional investors which invest in the assets belonging to a different country other than that where these organizations are based.

Foreign institutional investors play a very important role in any economy. These are the big companies such as investment banks, mutual funds etc, who invest considerable amount of money in foreign markets say for example in Indian markets. With the buying of securities by these big players, markets trend to move upward and vice-versa. They exert strong influence on the total inflows coming into the economy.

In India market regulator SEBI has over 1450 foreign institutional investors registered with it. The FIIs are considered as both a trigger and a catalyst for the market performance by encouraging investment from all classes of investors which further leads to growth in financial market trends under a self-organized system.

The Indian stock market was opened up to FII investment in 1992-93 and since then there has been a significant increase in the portfolio investment by FIIs.

In India, FIIs cover overseas pension funds, mutual funds, investment trusts, asset management companies, nominee companies, banks, institutional portfolio managers, university funds, endowments, foundations, charitable trusts, charitable societies, trustees or power of attorney holders incorporated or established outside India proposing to make proprietary investments or investments on behalf of a broad-based fund (i.e., fund having more than 20 investors with no single investor holding more than 10 per cent of the shares or units of the fund). India is one of the largest recipients of portfolio inflows among emerging market economies (EMEs).

The Regulations on Foreign Institutional Investors, which were notified on November 14, 1995, contains various provisions relating to definition of FIIs, eligibility criteria, investment restrictions, procedures of registration and general obligations and responsibilities of FIIs.

According to the Regulations, FIIs may invest only in:

(a) Securities in the primary and secondary markets including shares, debentures and warrants of companies listed on a recognized stock exchange in India, and

(b) Units of schemes floated by domestic mutual funds including Unit Trust of India, whether listed on a recognized stock exchange or not.

Joint ventures between a variety of domestic and foreign securities firms have been approved in the stock broking, merchant banking, assets management and other non-bank financial services sectors. The overall effect of FII investment and financial joint ventures has been the introduction of international practices and systems to the Indian Securities industry.

FIIs are permitted to invest in a company up to an aggregate of 24 per cent of equity, which can be increased to 40 per cent subject to approval by the Board of Directors and Special Resolution of the General Body.

In 1996-97, Government liberalized the FII investment policy, allowing them try invest in unlisted companies and in corporate and government securities. FII investment has become an important determinant of the stock market trends in India.

FDI inflow as a percentage of gross fixed capital formation of India increased from less than 2 per cent during 1990-2006 to nearly 6 per cent in 2007 but was less than 5 per cent in 2013.

4.11 ADVANTAGES AND DISADVANTAGES OF FIIs FLOWS INTO A COUNTRY

FIIs flows into a country are associated with several advantages and disadvantages.

Advantages

♦ Enhanced flows of equity capital

♦ FIIs have a greater appetite for equity than debt in their asset structure. The opening up the economy to FIIs has been in line with the accepted preference for non-debt creating foreign inflows over foreign debt. Enhanced flow of equity capital helps improve capital structures and contributes towards building the investment gap.

♦ Managing uncertainty and controlling risks.

♦ FII inflows help in financial innovation and development of hedging instruments. Also, it not only enhances competition in financial markets, but also improves the alignment of asset prices to fundamentals.

♦ Improving capital markets.

♦ FIIs as professional bodies of asset managers and financial analysts enhance competition and efficiency of financial markets.

♦ Equity market development aids economic development.

- By increasing the availability of riskier long term capital for projects, and increasing firms' incentives to provide more information about their operations, FIIs can help in the process of economic development.

- Improved corporate governance.

- FIIs constitute professional bodies of asset managers and financial analysts, who, by contributing to better understanding of firms' operations, improve corporate governance. Bad corporate governance makes equity finance a costly option. Also, institutionalization increases dividend payouts, and enhances productivity growth.

Disadvantages

- **Problems of Inflation:**

  Huge amounts of FII fund inflow into the country creates a lot of demand for rupee, and the RBI pumps the amount of Rupee in the market as a result of demand created.

- **Problems for small investor:**

  The FIIs profit from investing in emerging financial stock markets. If the cap on FII is high then they can bring in huge amounts of funds in the country's stock markets and thus have great influence on the way the stock markets behaves, going up or down. The FII buying pushes the stocks up and their selling shows the stock market the downward path. This creates problems for the small retail investor, whose fortunes get driven by the actions of the large FIIs.

- **Adverse impact on Exports:**

  FII flows leading to appreciation of the currency may lead to the exports industry becoming uncompetitive due to the appreciation of the rupee.

- **Hot Money:**

  "Hot money" refers to funds that are controlled by investors who actively seek short-term returns. These investors scan the market for short-term, high interest rate investment opportunities. "Hot money" can have economic and financial repercussions on countries and banks. When money is injected into a country, the exchange rate for the country gaining the money strengthens, while the exchange rate for the country losing the money weakens. If money is withdrawn on short notice, the banking institution will experience a shortage of funds.

4.12 PRIVATE EQUITY

Private equity is capital that is not noted on a public exchange. Private equity is composed of funds and investors that directly invest in private companies, or that engage in buyouts of public companies, resulting in the delisting of public equity. Institutional and retail investors provide the capital for private equity, and the capital can be utilized to fund new technology, make acquisitions, expand working capital, and to bolster and solidify a balance sheet.

Private equity comes primarily from institutional investors and accredited investors, who can dedicate substantial sums of money for extended time periods. In most cases, considerably long holding periods are often required for private equity investments, in order to ensure a turnaround for distressed companies or to enable liquidity events such as an initial public offering (IPO) or a sale to a public company.

Since the 1970s, the private equity market has strengthened readily. Pools of funds are sometimes created by private equity firms in order to privatize extra-large companies. A significant number of private equity firms perform actions known as leveraged buyouts (LBOs). Through LBOs, substantial amounts of money are provided in order to finance large purchases. After this transaction, private equity firms attempt to improve the prospects, profits and overall financial health of the company, with the ultimate goal being a resale of the company to a different firm or cashing out through an IPO.

4.13 NOTES

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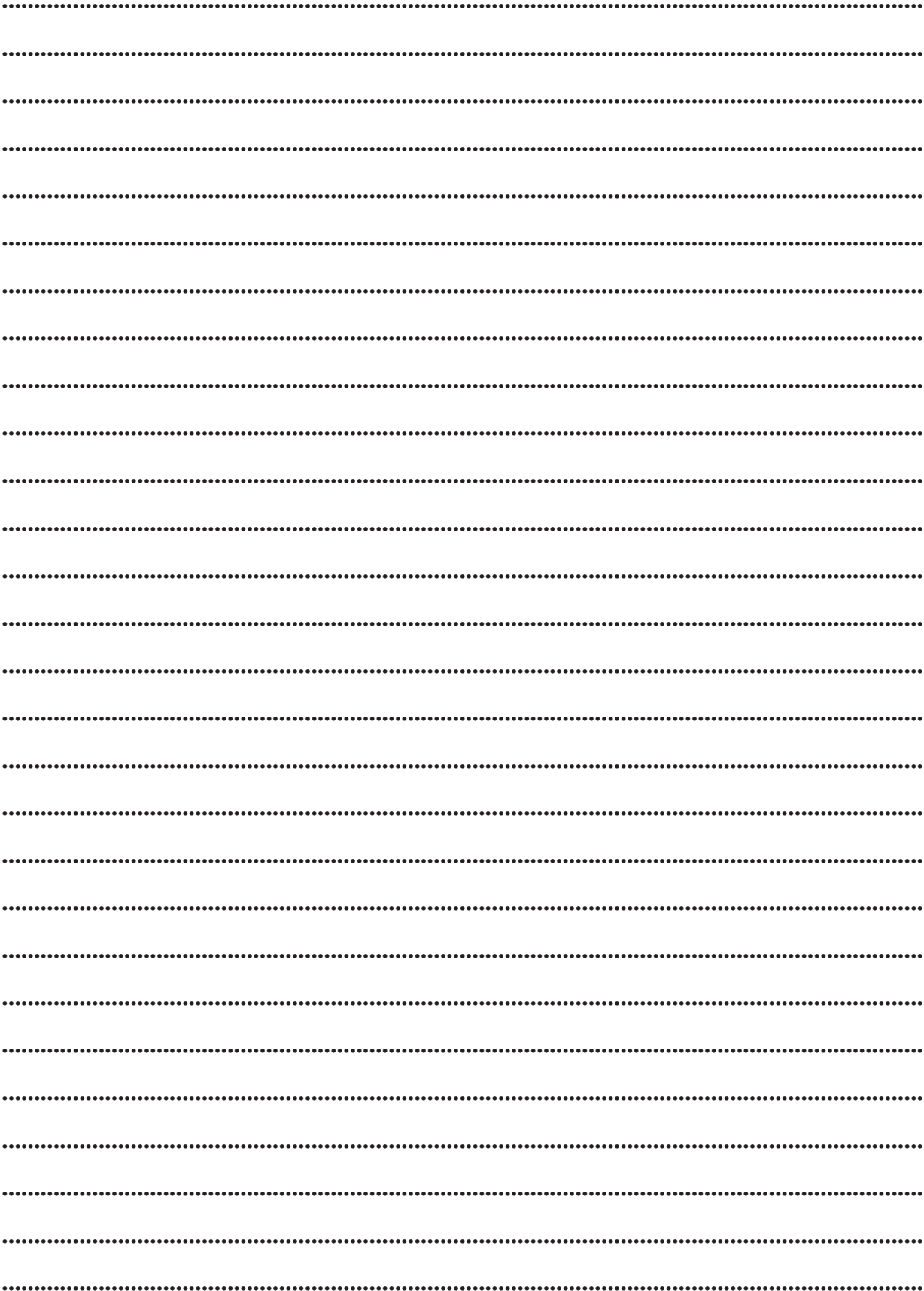..

4.14 SUMMARY

The foreign investment can be classified into two broad categories, first one is Foreign Direct Investment (FDI),and the second is, Foreign Institutional Investments. The foreign direct investment is a long term investment/ establishment of a firm or joint venture or any other form in the foreign country. Foreign direct investment has both costs and benefits to the host and home countries. In past lion share of FDI used to go to developed countries but at present the trend has been changed the developing nations are also getting large portion of FDI.

The Foreign institutional Investors (FIIs) are those institutional investors which are invest in the assets belonging to a different country other than that where these organisations are based it is a short term in nature. FIIs largely influence the stock markets and economy as whole.

Private equity is an important source of funds to a firm which is in crisis, Private equity is capital that is not noted on a public exchange. Private equity is composed of funds and investors that directly invest in private companies, or that engage in buyouts of public companies, resulting in the delisting of public equity. Institutional and retail investors provide the capital for private equity, and the capital can be utilized to fund new technology, make acquisitions, expand working capital, and to bolster and solidify a balance sheet.

4.15 KEY WORDS

Private equity, Foreign direct investment, Foreign institutional investors, stock exchange, risk.

4.16 SELF- ASSESSMENT QUESTIONS

1. What is foreign direct investment? Explain costs and benefits of it.

2. What are the factors affecting international investment?

3. What is FII? What are its advantages?

4. Write a note on private equity.

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MODULE-II
FOREIGN EXCHANGE MARKET

UNIT-5: FUNCTIONS AND STRUCTURE OF FOREIGN EXCHANGE MARKET

Structure :

5.0   OBJECTIVES

After studying this unit, you should be able to;

- define the term Foreign Exchange Market

- describe the evolution of Foreign Exchange Market.

- explain the structure of Foreign Exchange Market.

- discuss the functions of Foreign Exchange Market.

5.1   INTRODUCTION

Foreign Exchange Market (Forex, FX or Currency Market) can be defined as a global decentralized market for the trading of currencies. The foreign exchange market provides the physical and institutional structure through which the currency (money) of one country is exchanged for that of another country, the rate of exchange between currencies is determined, and foreign exchange transactions are physically consummated. A foreign exchange transaction is an agreement between a buyer and a seller that a given amount of one currency is to be delivered at a specified rate for some other currencies.

The foreign exchange market allows for the exchange of one currency for another.Large commercial banks serve this market by holding inventories of each currency, so that they can accommodate requests by individuals or MNCs. Individuals rely on the foreign exchange market when they travel to foreign countries. People from the United States exchange dollars for Mexican pesos when they visit Mexico or Euros when they visit Italy or Japanese yen when they visit Japan. Some MNCs based in the United States exchange dollars for Mexican pesos when they purchase supplies in Mexico that are denominated in pesos, or Euros when they purchase supplies from Italy that are denominated in Euros.

Other MNCs in the United States receive Japanese yen when selling products to Japan and may wish to convert the yen to dollars. For one currency to be exchanged for another currency there needs to be an exchange rate that specifies the rate at which one currency can be exchanged for another. The markets are situated throughout the different time zones of the globe in such a way that when one market is closing the other is beginning its operations. Thus at any point of time one market or the other is open. Therefore, it is stated that foreign exchange market is functioning throughout 24 hours of the day.

Foreign exchange market is the largest financial market with a daily turnover of over USD 2 trillion. Foreign exchange markets were primarily developed to facilitate settlement of debts arising out of international trade. But these markets have developed on their own so much so that a turnover of about 3 days in the foreign exchange market is equivalent to the magnitude of world trade in goods and services. The largest foreign exchange market is London followed by New York, Tokyo, Zurich and Frankfurt.

The business in foreign exchange markets in India has shown a steady increase as a consequence of increase in the volume of foreign trade of the country, improvement in the communications systems and greater access to the international exchange markets. Still the volume of transactions in these markets amounting to about USD 2 billion per day does not compete favorably with any well developed foreign exchange market of international repute.The reasons are not far to seek. Rupee is not an internationally traded currency and is not in great demand. Much of the external trade of the country is designated in leading currencies of the world, Viz., US dollar, pound sterling, Euro, Japanese yen and Swiss franc. Incidentally, these are the currencies that are traded actively in the foreign exchange market in India.

5.2 MEANING OF FOREIGN EXCHANGE MARKET

A foreign exchange market refers to buying foreign currencies with domestic currencies and selling foreign currencies for domestic currencies. Thus it is a market in which the claims to foreign moneys are bought and sold for domestic currency. Exporters sell foreign currencies for domestic currencies and importers buy foreign currencies with domestic currencies. Foreign exchange transactions encompass everything from the conversion of currencies by a traveler at anto billion-dollar payments made by corporations, financial institutions and governments. Transactions range from imports and exports to speculative positions with no underlying goods or services. Increasing globalization has led to a massive increase in the number of foreign exchange transactions in recent decades.

Foreign Exchange refers to foreign currencies possessed by a country for making payments to other countries. It may be defined as exchange of money or credit in one country for money or credit in another. It covers methods of payment, rules and regulations of payment and the institutions facilitating such payments. The global foreign exchange market is the largest financial market in the world, with average daily volumes in the trillions of dollars. Foreign exchange transactions can be done for spot or forward delivery. There is no centralized market for forex transactions, which are executed over

the counter and around the clock. The foreign exchange market is the market in which participants are able to buy, sell, exchange and speculate on currencies. Foreign exchange markets are made up of banks, commercial companies, central banks, investment management firms, hedge funds, and retail forex brokers and investors. The forex market is considered the largest financial in the world.

5.3   DEFINITIONS OF FOREIGN EXCHANGE MARKET

Foreign exchange market is described as an OTC (Over the counter) market as there is no physical place where the participants meet to execute their deals. It is more an informal arrangement among the banks and brokers operating in a financing centre purchasing and selling currencies, connected to each other by telecommunications like telex, telephone and a satellite communication network, SWIFT. The term foreign exchange market is used to refer to the wholesale a segment of the market, where the dealings take place among the banks. The retail segment refers to the dealings take place between banks and their customers.

The retail segment refers to the dealings take place between banks and their customers. The retail segment is situated at a large number of places. They can be considered not as foreign exchange markets, but as the counters of such markets. The leading foreign exchange market in India is Mumbai, Calcutta, Chennai and Delhi is other centers accounting for bulk of the exchange dealings in India. The policy of Reserve Bank has been to decentralize exchanges operations and develop broader based exchange markets. As a result of the efforts of Reserve Bank Cochin, Bangalore, Ahmadabad and Goa have emerged as new centre of foreign exchange market in India.

Foreign Exchange refers to foreign currencies possessed by a country for making payments to other countries. It may be defined as exchange of money or credit in one country for money or credit in another. It covers methods of payment, rules and regulations of payment and the institutions facilitating such payments.

According to **Ellsworth,** "A Foreign Exchange Market comprises of all those institutions and individuals who buy and sell foreign exchange which may be defined as foreign money or any liquid claim on foreign money". Foreign Exchange transactions result in inflow & outflow of foreign exchange.

5.4   EVOLUTION OF FOREIGN EXCHANGE MARKET

In the earliest of times, man traded furs and skins and eventually grains and oils, dried fish, sheep, horses, cattle, and oxen. Because of their durability, oxen became a favorite medium of exchange. In time, with division of labor and urban living came a new era in which new uses were found for metals (copper, bronze, gold and silver). Because of their added usefulness, portability, and divisibility, their value increased and they were eventually accepted as the medium of exchange. For convenience, standardized pieces of metal, known as coins, came into use. Occasionally, when coins were in short supply, substitutes were used as "promises to pay" metals on demand. As stores of metal became too cumbersome to carry, paper receipts were issued for gold and silver deposited with goldsmiths for safekeeping. As long as the goldsmith was honest and secure, such practice was preferred, and eventually led to "banks" holding deposits for their customers and transferring them by cheques.

In time, people grew accustomed to using paper money as a substitute for gold and silver. The next step in the evolution of money was "legal tender" legislation, which forced people to accept paper in settlement of government debts during times of emergency (most recently in the United States during the Civil War). After many years of "emergency" use of paper money, the ability to redeem the paper for precious metals was revoked and the money became known as a *fiat* currency. At this point, the currency derived its value from both the ability of the issuing government to produce hard assets as back-up for its currency (through taxes, and borrowing) and the people's willingness to recognize (accept) the currency's value of course, there is no limit to the amount of paper money and credit that can be issued, which is too much for most legislators to resist. Thus, pork barreling (buying votes) has led to budget deficits, economic "stimulation" and inflation. One type of government intervention leads to another, until there is a world-wide competition among governments to stimulate their own economies relative to all others through monetary expansion. Another consequence of legal tender laws was that each country, by requiring that its own currency be used within its borders, shut out all other currencies, thus necessitating the exchange of one currency for another by international businessmen and travelers. Thus was born the phenomenon of exchange rates and the need for determining the price of one currency relative to another

The "price" of money is determined the same way the prices of all other commodities are determined: through supply and demand, and expectations of future supply and demand. The greater the supply and/or expected supply, given a constant demand, the lower the price. Of course, the "price" of money is relative to the goods or

other currencies that it will purchase. For example, when we talk in terms of buying an ounce of silver, we may state the price in terms of U.S. dollars as $14.00 per ounce. We may also state the price of silver in terms of Euros as €10.00. From the perspective of the currency, the price is €10,00 or $14.00, but from the perspective of the silver, the price of the currency is, respectively, one-tenth or one-fourteenth of an ounce. Notice that different currencies have different prices relative to the one ounce of silver. It depends on which measuring stick or currency we use, what the stated price of one ounce of silver is. In time, either the price of the measuring stick, i.e. the currency, or the commodity price can change as a result of changing supply and demand.

For example, the price of one ounce of silver could become U.S.$20.00 and €13.33. Notice that the price of one ounce of silver has increased by 42.86% in terms of the U.S. dollar, while it has increased by 33.30% in terms of the Euro. The fact that the price of one ounce of silver changed at different rates relative to the two currencies demonstrates that the "prices" of the two currencies changed relative to one another. Thus, it is apparent that the measuring stick, i.e. the currency, has changed relative to other measuring sticks (currencies), *and* other commodities (one ounce of silver in this case).

The system used for exchanging foreign currencies has evolved from the gold standard, to an agreement on fixed exchange rates, to a floating rate system as follows.

◆ **Gold Standard**: From 1876 to 1913, exchange rates were dictated by the goldstandard.Each currency was convertible into gold at a specified rate. Thus, the exchangerate between two currencies was determined by their relative convertibilityrates per ounce of gold. Each country used gold to back its currency. When World War I began in 1914, the gold standard was suspended. Some countriesreverted to the gold standard in the 1920s but abandoned it as a result of abanking panic in the United States and Europe during the Great Depression. In the1930s, some countries attempted to peg their currency to the dollar or the Britishpound, but there were frequent revisions. As a result of the instability in the foreignexchange market and the severe restrictions on international transactions during thisperiod, the volume of international trade declined.

◆ **Agreements on Fixed Exchange Rates:**In 1944, an internationalagreement (known as the Breton Woods Agreement) called for fixed exchangerates between currencies. This agreement lasted until 1971. During this period, governmentswould intervene

to prevent exchange rates from moving more than one percentabove or below their initially established levels.By 1971, the U.S. dollar appeared to be overvalued; the foreign demand forU.S. dollars was substantially less than the supply of dollars for sale (to be exchangedfor other currencies). Representatives from the major nations met to discuss this dilemma.

- **Smithsonian Agreement**:As a result of this conference, which led to the Smithsonian Agreement, theU.S. dollar was devalued relative to the other major currencies. The degree to whichthe dollar was devalued varied with each foreign currency. Not only was the dollar'svalue reset, but exchange rates were also allowed to fluctuate by 2.25 percent in eitherdirection from the newly set rates. This was the first step in letting market forces(supply and demand) determine the appropriate price of a currency. Although boundariesstill existed for exchange rates, they were widened, allowing the currency valuesto move more freely toward their appropriate levels.

- **Floating Exchange Rate System**: Even after the SmithsonianAgreement, governments still had difficulty maintaining exchange rates within thestated boundaries. By March 1973, the more widely traded currencies were allowed to fluctuate in accordance with market forces, and the official boundaries wereeliminated. This phenomenon of the prices of currencies changing relative to one another can be easily seen by looking at a history of changes between the U.S. dollar and the Euro, starting on January 3, 2000. For the cost of one Euro in terms of U.S. dollars. It is interesting to note that on January 3, 2000, it cost $1.0155 to purchase one Euro, while on October 25, 2000, the price of one Euro hit a low of $.8270, and on October 25, 2007, it cost $1.4299 U.S. dollars to purchase one Euro. (Each country or group of countries that controls its own currency has the power to inflate or deflate its currency relative to others. And each country does regulate" the price of its currency by expanding or contracting its money supply, often with an eye toward other currencies. Politicians and central bankers believe that it is easier for their exporters to export goods to other countries when their own currency is "cheaper" than the currencies of the other countries promoting a more "favorable" balance of trade. Debtor nations also benefit from inflating their currencies by paying off their debts with cheaper money.)

5.5 CHARACTERISTICS OF FOREIGN EXCHANGE MARKET

The world's largest financial market, the foreign exchange (or forex) market offers unmatched benefits and advantages to the prospective investor. With superior liquidity and leverage compared to stocks and futures markets, the forex market is arguably the best financial investment as follows:

♦ **Lower trading Costs:**The lower trading costs in the forex market have made it possible for even small, individual investors to make decent profits from forex trading. With lower costs, the possible losses are also much lower. The forex trading usually has no commission fees in other investments. The costs of forex trading are limited to the spread or the difference between the selling and buying prices for a particular currency pair.

♦ **Excellent Transparency:**Transparency means the free access to trading information. Forex trading is a transparent process because the trader has full access to market data and information that are necessary to perform successful transactions. The excellent transparency of the forex market means that forex traders have more control over their investments and can decide what to do based on the informationavailable in the market in India.

♦ **Superior Liquidity**: In a forex market, traders are free to buy and sell currencies of their own choosing. The superior liquidity of the forex market enables traders to easily exchange currencies without affecting the prices of the currencies being traded. So whether you trade a few thousand dollars or several millions, you can be assured of the same currency prices during the time an order was placed and then executed. The forex market's superior liquidity allows you to get the profits you expect at the time you made the trade.

♦ **Strong market trends:**Forex traders make money by getting accurate market data and then analyzing the direction the market takes. To do this, forex traders rely heavily on trends and trending in an attempt to predict the direction of the forex market. Most traders use technical analysis to analyze past and present forex market data and then search for trends. Other financial markets use trends and trending but this characteristic is much stronger in the forex market. Due to strong trending, forex markets are much easier to analyze and identify possible entry and exit positions during trading in India.

5.6 FUNCTIONS OF FOREIGN EXCHANGE MARKET

Foreign exchange is also referred to as forex market. Participants are importers, exporters, tourists and investors, traders and speculators, commercial banks, brokers and central banks. Foreign bill of exchange, telegraphic transfer, bank draft, letter of credit etc. are the important foreign exchange instruments used in foreign exchange market to carry out its functions as follows.

♦ **Transfer of Purchasing Power Clearing Function:** The basic function of the foreign exchange market is to facilitate the conversion of one currency into another i.e. payment between exporters and importers. For eg. Indian rupee is converted into U.S. dollar and vice-versa. In performing the transfer function variety of credit instruments are used such as telegraphic transfers, bank drafts and foreign bills. Telegraphic transfer is the quickest method of transferring the purchasing power.The Primary function of a foreign exchange market is the transfer of purchasing power from one country to another and from one currency to another. The international clearing function performed by foreign exchange markets plays a very important role in facilitating international trade and capital movement.

♦ **Credit Function:** The foreign exchange market also provides credit to both national and international, to promote foreign trade. It is necessary as sometimes, the international payments get delayed for 60 days or 90 days. Obviously, when foreign bills of exchange are used in international payments, a credit for about 3 months, till their maturity, is required. The credit function performed by foreign exchange markets also plays a very important role in the growth of foreign trade, for international trade depends to a great extent on credit facilities. Exporters may get pre shipment and post shipment credit. Credit facilities are available also for importers. The Euro dollar market has emerged as a major international credit market **For Example**. Mr. A can get his bill discounted with a foreign exchange bank in New York and this bank will transfer the bill to its correspondent in India for collection of money from Mr. B after the stipulated time.

♦ **Hedging Function:** A third function of foreign exchange market is to hedge foreign exchange risks. By hedging, we mean covering of a foreign exchange risk arising out of the changes in exchange rates. Under this function the foreign exchange market tries to protect the interest of the persons dealing in the market from any unforeseen changes in exchange rate. The exchange rates under free market can go up and down; this can either bring gains or losses to concerned parties. Hedging

guards the interest of both exporters as well as importers, against any changes in exchange rate. Hedging can be done either by means of a spot exchange market or a forward exchange market involving a forward contract. The other important of the foreign exchange market is to provide hedging facilities.Hedging refers to covering of foreign trade risks, and it provides a mechanism to exporters and importers to guard themselves against losses arising from fluctuations in exchange rates.

Illustrations:

1. An important of an Indian firm imports good for 62500 pounds to be paid after 1months. The importer buy a call option at a strike price of ₹ 60 per pound premium being Rs.005 per pound if the spot rate on exercise price is 60.20.What will importer do what will be net pay off? Suppose the spot rate is 58.80.What is the action of importer? What is next pay off?

Solution:

An important has bought a call option with the exercise price of 60 per pound. The premium is 1 and 0.05 per pound.

On the date of expiry, the stock price is 60.20.

That is $S_0 > E$, call option is in the money. Therefore the option is exercised.

a. The growth pay off would be 60.20-60

$$= 20 \text{per pound}$$

b. The net pay off = gross pay off- premium

$$= 0.20\text{-}0.05$$

$$= 0.15 \text{ per pound}$$

c. Therefore, the total Net Pay off would be

$$= 62500 \text{X} 0.15$$

9375

2. US importer, importing the goods for pound 62500 fears an appreciation of pound he like to hedge the risk through option. Option are available to him at two different rates.

a. USD 1.60 per pound with a premium of 10.03 per pound.

b. USD 1.70per pound with a premium of $0.03per pound.

If the spot rate on security goes up to 1.65per pound, what will be his course of action.

Solution:

Since the importer has to enter into call option, both the call option is available as priced with equal premium. The importer will choose for the call option with a lesser exercise price. Therefore, the importer will buy call option with exercise price of USD 1.60 per pound with a Premium of USD 0.03 per pound.

On the expiry date, the spot price so is 1.6, it is greater than E and therefore the option is "In the Money". Hence it is exercised. The gross pay off is 1.65-1.60=$0.05 per pound.

Therefore, the total gross pay off is 0.05X62500

= $ 3125

The premium paid is 0.03X62500=$ 1875

Therefore the net pay off is = Gross pay off- Premium

= 3125 – 1875 = $ 1250

Note: The call option with a lower exercise price should command higher premium. The call option with the higher exercise price should command lower premium. In this situation the premium is same for the exercise price of USD 1.60 and USD 1.70. It is assumed that when the premium being same, importer would select the option with the lowest exercise price that is USD 1.60

Suppose the importer had the option at USD 1.70, the spot rate on expiration date is USD 1.65 S_0<E 1.65<1.70. Hence the option would have been out of the money. The gross pay off would be '0' and the net pay off would be equal to premium paid. i.e, 0.03X62500=1875USD(loss).

5.7   STRUCTURE OF FOREIGN EXCHANGE MARKET

The foreign exchange market is a worldwide market and is made up primarily ofcommercial banks, foreign exchange brokers and other authorized agents trading in most of the currencies of the world. These groups are kept in close and continuous contact with one another and with developments in the market via telephone, computer terminals, telex and fax. Among the most important foreign exchange centers are London, New York, Tokyo, Singapore and Frankfurt. The net volume of foreign exchange dealing globally was in April 1995 estimated to be inexcess of $1250 billion per day, the most active centers being London with a daily turnover averaging $464 billion, followed by New York with $244 billion and Tokyo with $161 billion,Singapore $105 billion with

Paris $58 billion and Frankfurt $76 billion. the most heavily used currencies and the most important centers for foreign exchange business Easily the most heavily traded currency is the US dollar, which isknown as a vehicle currency - because it is widely used todenominate international transactions.

The structure of foreign exchange market can be categorized as follows:

♦ **Retail Clients**: These are made up of businesses, international investors, multinational corporations and the like who need foreign exchange for the purposes of operating their businesses. Normally, they do not directly purchase or sell foreign currencies themselves; rather they operate by placing buy sell order with commercial banks.

♦ **Commercial Banks:** The commercial banks carry our buy/sell orders from their retail clients and buy/sell currencies on their own account (known proprietary trading) so as to alter the structure of their assets and liabilities in different currencies. The banks deal either directly with other banks of through foreign exchange brokers. In addition to the commercial banks other financial institutions such as merchant banks are engaged in buying and selling of currencies both for proprietary purposes and on behalf of their customers in finance-related transactions. The International Money Market ([MMJ Chicago trades foreign exchange futures and DM futures options, The London international financial futures exchange (LIFFE) trades foreign exchange futures. The Philadelphia stock exchange (PSE) trades foreign currency options.

♦ **Foreign Exchange Brokers:** Often banks do not trade directlywith one, another, rather they offer to buy and sell currencies viaforeign exchange brokers. Operating through such brokers isadvantageous because they collect buy and sell quotations formost currencies from many banks, so that the most favorablequotation is obtained quickly and at very low cost. Onedisadvantage of dealing though a broker is that a smallbrokerage fee is payable, which neither is nor incurred in astraight bank-to-bank deal. Each financial centre normally hasjust a handful of authorized brokers through which commercialbanks conduct their exchanges.

♦ **Central Banks:** Normally the monetary authorities of a country are not indifferent to changes in the external value of their currency, and even though exchange rates of the major industrialized nations have been left to fluctuate freely since 1973, central banks frequently intervene to buy and sell their currencies in a bid to influence the rate at which their currency is traded. Under a fixed exchange-rate

system the authorities are obliged to purchase their currencies when there is excess supply and sell the currency when there is excess demand. Central banks serve as their governments' banker for domestic and international payments. They handle most or all foreign exchange transactions for the government as well as for important public sector enterprises. They may also pay or receive a foreign currency not usually held in official reserves. **For example**, the Federal Reserve Bank of New York handles a substantial volume of foreign exchange transactions for its correspondents who wish to buy or sell dollars for other currencies. Moreover, most central banks frequently enter into exchange transactions with international and regional organizations which need to buy or sell the local currency. The most important role of central banks in exchange market operations is their intervention in the exchange market to influence market conditions or the exchange rate. They carry out intervention operations either on behalf of the country's treasury department or for their own account.

In their dealings with non-bank customers, banks in mostcountries use a system of direct quotation. A direct exchange ratequote gives the home currency price of a certain quantity of theforeign currency quoted (usually 100 units. but only one unit inthe case of the U.S. dollar or the pound sterling). For example,the price of foreign currency is expressed in French francs (FF) inFrance and in Deutsche marks (OM) in Germany. Thus, inFrance, the Deutsche mark might be quoted at FF 4 while, inGermany; the franc would be quoted at OM 0.25.

There are exceptions to this rule, though. Banks in Great Britainquote the value of the pound sterling (f) in terms of theforeign currency for example, f1 = $1.7625.This method ofindirect quotation is also used in the United States for domesticpurpose and for the Canadian dollar. In their foreign exchangeactivities abroad, however, U.S. banks adhere to the Europeanmethod of direct quotation.Banks do not normally charge a commission on their currencytransactions, but profit from the spread between the buyingand selling rates. Quotes are always given in pair's because adealer usually does not know whether a prospective customer isin the market to buy or to sell a foreign currency. The first rate isthe buy, or bid, price: the second is the sell, or ask, or offer, rate. Suppose the pound sterling is quoted at $1.7019-36. This quotemeans that banks are willing to buy pounds at $1.7019 and sellthem at $1.7036. In practice, dealers do not quote the full rate toeach other; instead, they quote only the last two digits of thedecimal. Thus, sterling would be quoted at 19-36 in the aboveexample. Any dealer who isn't sufficiently up-to-date to know the preceding numbers will not remain in business for longnin the foreign exchange market in India.

5.8   TYPES OF FOREIGN MARKET PARTICIPANTS

The forex market is an OTC market without any centralized clearinghouse. It consists of two tiers.

I. The Interbank or Wholesale Market; and

II. Client or Retail Market.

Five broad categories of participants operate within these two tiers:

1. Bank and Non-Bank foreign exchange dealers;

2. Foreign exchange brokers;

3. Hedgers, Speculators and Arbitragers; and

4. Central banks and Treasuries.

I Wholesale Forex Market

Major forex trading in the wholesale forex markets is undertaken by banks – popularly known as interbank market. In this market, banks and non-bank financial institutions transact with each other. They undertake trading on behalf of customers, but majority of trading is undertaken for their own account by proprietary desks.

1.   Bank and Non-Bank Foreign Exchange Dealers:

Besides banks and non-bank financial institutions, multinational corporations, hedge funds, pension and provident funds, insurance companies, mutual funds etc. participate in the wholesale market. Big multinational companies earn their revenue and incur expenses in many different currencies. For example, Switzerland based Nestle operates in 86 countries across the globe. To hedge their foreign exchange risk these multinational companies directly participate in the wholesale market. Hedge funds are also major player in this market. Hedge funds collect huge sums from high net worth individuals and undertake speculative trades in equity, debt, forex and derivatives market. Mutual funds with international equity portfolio are also major players in this market.

2.   Foreign Exchange Dealers and Brokers:

The role of foreign exchange dealers and brokers need to be discussed in detail. But, let us first understand who forex dealers are.

a.   *Dealers:*

Banks and some nonblank financial institutions act as foreign exchange dealer. These dealers quote both "bid" and "ask" for a particular currency pair (for spot, forward

and swap contracts) and take opposite side to either buyers or sellers of currency. They make profit from the spreads between buying and selling prices ie., bid and ask rate. Brokers are agents, which merely match buyers and sellers and get a brokerage fee. Before the internet, the brokers, dealers and clients were communicating over telephone or telex and through satellite communication. SWIFT (Society for Worldwide Interbank Financial Telecommunication) facilitated the communication between these brokers and banks. Brokers and dealers used to have terminals from Reuters and Bloomberg indicating the bid and ask spread quoted by different currency transactions. Dealers also trade foreign exchange as part of their own proprietary trade. In proprietary trading, dealers invest their own capital and undertake currency trading. Unlike the smaller margin received by dealers from the bid-ask spread, in proprietary trades, dealers expect a larger profit margin. They mainly undertake trades based on directional view about a currency depending on interest rate change, major policy move etc.

b. *Brokers:*

Brokers on the other hand, help clients to get a better rate on the currency trade by making available different quotes offered by dealers. Traders can compare rates and accordingly take a decision. Brokers charge a commission for providing these services. Communication between brokers and clients also used to be through dedicated telephone lines. A broker continuously remains connected to dealers to get latest quotes, depth of the market. The broker compares the rates offered by the dealers and provides the best rates to the clients i.e, highest bid prices quoted by different dealers when the client wants to sell and lowest ask price quoted by different dealers when the clients wants to buy. With the emergence of communication technology, now most of the most of broker deals are happening in electronic brokering system.

Foreign exchange dealers trade among themselves through direct dealing and through brokers. In case of direct dealing, two dealers contact each other directly and undertake a trade. Like any other traders, dealers may contact brokers for executing their proprietary trades if these dealers want anonymity in trading.

3. **Hedger, Speculators and Arbitrageurs:**

Traders buying and selling foreign exchange can take the role of hedgers, or speculators or arbitrageurs.

a. *Hedgers:*

These are traders who undertake forex trading because they have assets or liability in foreign currency. For example, when an importer requiring foreign currency, sells

domestic currency to buy foreign currency, he is termed as a hedger. The importer has a foreign currency liability. Similarly, an exporter sells foreign currency and buys domestic currency is a hedger. The exporter has assets denominated in foreign currency. A MNC entering into a foreign currency forward contract so that it can repatriate its earning to parent company. An Indian company swapping its foreign currency interest payment obligations to INR interest obligation. All these are examples of hedging. Hedgers use the foreign currency market to hedge the risk associated with volatility in foreign exchange market.

b.   *Speculators:*

These are traders who essentially buy and sell foreign currency to make profit from the expected futures movement of the currency. These traders do not have any genuine requirement for trading foreign currency. They do not hold any cash position in the currency.

c.   *Arbitrageurs:*

Thesebuy and sell the same currency at two different markets whenever there is price discrepancy. The principle of "law of one price" governs the arbitrage principle. Arbitrageurs ensure that market prices move to rational or normal levels. With the proliferation on internet, cross currency, cross currency arbitrage possibility has increased significantly.

4.   Central Banks and Treasuries:

All most all central bank and treasuries participate in the forex market. Central banks play very important role in foreign exchange market. However, these banks do not undertake significant volume of trading. Each central bank has official/unofficial target of the forex rate for its home currency. If the actual price deviates from the target rate, the central banks intervene in the market to set a tone. Besides central banks, other commercial banks also buy and sell forex.

II   RETAIL MARKET:

In the retail market, individuals (tourists, foreign students, patients traveling to other countries for medical treatment) small companies, small exporters and importers operate. Money transfer companies/remittance companies (for example like Western Union) are also major players in the retail market. Retail traders buy/sell currency for their genuine business/personal requirements. For example, an exporter enters into forward contract to convert foreign currency to domestic currency. A tourist buys foreign

currency in the spot market before undertaking the journey. Majority of retail trading happens in the spot market. Why? As retailers' requirements are normally not repetitive in nature, they buy or sell the currency as when the requirement arises.

5.9   CASE STUDY

Case Study 1

Foreign exchange intervention is defined generally as foreign exchange transactions conducted by a country's monetary authorities with the aim of influencing exchange rates. In Japan, the Minister of Finance is legally authorized to conduct intervention as a means to achieve foreign exchange rate stability. The Bank of Japan, as the agent of the Minister of Finance, executes foreign exchange intervention operations in accordance with the directions of the Minister of Finance. Japan's Foreign Exchange and Foreign Trade Law stipulates that the Minister of Finance shall endeavor to stabilize the external value of the yen by taking necessary measures including foreign exchange transactions.

Intervention by the Bank of Japan as the agent of the Minister of Finance is conducted by the account of the Japanese Government, which is called the Foreign Exchange Fund Special Account (FEFSA). This fund consists of foreign currency funds and yen funds. In case of U.S. dollar buying/yen selling intervention, for example, the yen funds to be sold are raised by issuing Financing Bills. In the event of U.S. dollar selling/yen buying intervention, U.S. dollar funds held in the FEFSA are used for buying the yen in the markets.

The Japanese Government holds large amounts of foreign currencies in the FEFSA, partly as a result of foreign currency buying/yen selling interventions in past yen appreciation phases. The Minister of Finance makes decisions on investments of these currencies paying careful attention to liquidity and safety. Most of these funds have been invested in securities issued by the authorities of major industrial countries, which are almost immune from liquidity risk.

In the United States, the Treasury Department and Federal Reserve Board have join authority for foreign exchange intervention; however, the Treasury Department has priority with regard to the decision. Once the decision to intervene is made, the policy is carried out by the Federal Reserve Bank of New York. There are cases where two or more monetary authorities implement intervention jointly by using their own funds at the same time or in succession. This is called "coordinated intervention

The issue for central banks is really two fold. First, their intervention activities, by their very nature, can only be small relative to the size of the foreign exchange market itself. Second, given that any positive effects are short term, and then market forces come to dominate, central bankers probably should consider very carefully whether this use of their reserves is appropriate. Central bankers in the developed world appear to have moved away, or are moving away, from foreign exchange intervention. Before we give up on this type of policy we should recognize that there might be situations associated with unusual and extreme market aberrations where intervention might be justified for very short term effects. Since this is a possibility, we should not rule out the use of central bank interventions in the future

QUESTIONS:

1. What is the Japanese intervention in foreign exchange market to extend the business in global perspective?

2. Give brief summary of impact of foreign exchange market from the case study?

Case Study 2

Shrewsbury Herbal Products, located in central England close to the Welsh border, is an old-line producer of herbal teas, seasonings, and medicines. Its products are marketed all over the United Kingdom and in many parts of continental Europe as well. Shrewsbury Herbal generally invoices in British pound sterling when it sells to foreign customers in order to guard against adverse exchange rate changes. Nevertheless, it has just received an order from a large wholesaler in central France for £320,000 of its products, conditional upon delivery being made in three months' time and the order invoiced in Euros.

Shrewsbury's controller, Elton Peters, is concerned with whether the pound will appreciate versus the euro over the next three months, thus eliminating all or most of the profit when the euro receivable is paid. He thinks this is an unlikely possibility, but he decides to contact the firm's banker for suggestions about hedging the exchange rate exposure. Mr. Peters learns from the banker that the current spot exchange rate is €/£ is €1.4537, thus the invoice amount should be €465,184. Mr. Peters also learns that the three-month forward rates for the pound and the euro versus the U.S. dollar are $1.8990/£1.00 and $1.3154/€1.00, respectively. The banker offers to set up a forward hedge for selling the euro receivable for pound sterling based on the €/£ forward cross-exchange rate implicit in the forward rates against the dollar.

5.10 NOTES

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5.11 SUMMARY

This unit discussed about the basic concept, meaning and definitions of foreign exchange market. The history and evolutions of foreign exchange market are discussed in the length. An account of functions and structures of foreign exchange market are given in this unit.

5.13 KEY WORDS

Foreign Exchange

Exchange Rate

Liquidity

Trading

Hedging

Brokers

Speculatars

Arbitrageurs

5.12 SELF ASSESSMENT QUESTIONS

1)   Define the term foreign exchange market

2)   Briefly explain the evolution of foreign exchange market?

3)   Explain the functions of foreign exchange market?

4)   Discuss the structure of foreign exchange market?

QUESTIONS

1.   Calculate the exchange rate of Shrewsbury herbal products Ltd?

2.   Suggest the solution for the above case in the conversion of foreign currency in forex market?

5.14 REFERENCES

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UNIT-6 : FOREIGN EXCHANGE TRANSACTIONS

Structure :

6.0   OBJECTIVES

After studying this unit, you should be able to;

- define the term foreign exchange transaction.

- describe the types of foreign exchange transaction.

- determine the foreign exchange market quotations and arbitrage.

- analyze the methods of foreign exchange market quotations.

6.1   INTRODUCTION

The "foreign exchange market transactions" should not be thought of as a specific building or location where traders exchange currencies. Companies normally exchange one currency for another through a commercial bank over a telecommunications network. The foreign exchange market facilitates economic interaction among different countries. Foreign exchange markets constitute a globally-connected network of currency broker dealers who make the market for the buying and selling of currencies from around the world. The advent of the Internet fostered unprecedented growth in the foreign exchange market worldwide. With practical applications for international trade, the foreign exchange market also boosts phenomenal speculative opportunities for day traders as a source of potential profit. In terms of a commodity, foreign exchange, or Forex, broadly refers to the currencies issued by the countries of the world.

The relative value of a given currency against that of another forms the basis for the exchange of one currency for another. The price at which this exchange occurs is called an exchange rate. This exchange occurs via currency broker-dealers in the global foreign exchange market. Foreign exchange transactions include: spot and forward foreign exchange purchase and sale transactions; the spot and forward foreign exchange transaction; and the foreign exchange option transactions. More specifically, foreign exchange transactions include: the spot foreign exchange purchase and sale and foreign exchange transaction business for personal customers; the spot, forward and option-date forward foreign exchange transaction business for corporate customers; and the foreign currency option transaction.

In the globalized economic environment of today, economic activity is globally unified to an unprecedented degree. Thus, changes in one nation's economy are rapidly transmitted to that nation's trading partners. These fluctuations in economic activity are reflected, almost immediately in fluctuations in currency values. The movements of

capital across the countries of the world taking the form of foreign direct investment, by Multinational Corporations involve to a greater extent the transaction in the alien countries' currencies. In the domestic economy financial management is concerned with costs of financing sources and the pay offs from investment. However, in the domestic economy movements of exchange rates are substantially ignored. While one move outside into international arena, there is no way that we can analyze international financing and investment opportunities without an understanding of the impact of foreign exchange rates.

Foreign investments aimed at overcoming foreign market regulations, reducing production costs, taking advantage of new market opportunities etc. are by no means new or recent origin. However, certain new trends and dimensions of such investments are discernible. The globalization of business has created new trading environment emerging from economic integration and trade agreements among the countries of the world. Economic liberalization in many countries initiated a proactive role by companies with large cash surpluses to venture into foreign business. If money is the language of business, foreign exchange is the language of international business. In this respect our aim in this unit is to discuss the various facets foreign exchange transactions.

6.2   MEANING OF FOREIGN EXCHANGE TRANSACTIONS

The foreign exchange transaction trade takes place between the residents of two countries; the two countries being a sovereign state have their own set of regulations and currency. Due to this problem arises in the conduct of international trade and settlement of the transactions .While the exporter would like to get the payment in the currency of hisown country, the importer can pay only in the currency of the importers country. This creates a need for the conversion of the currency of importer's into that of the exporter's country. Foreign exchange is the mechanism by which the currency of one country is gets converted into the currency of another country. The conversion is done by banks who deal in foreign exchange.

When one currency is converted into another, there must be some basis in effecting the conversion. The basis by which the currency unit of one country gets converted into currency units of another country is known as foreign exchange rate. Foreign exchange rate is therefore the price of one currency in terms of another. The rate of exchange for a currency is known from the quotation in the foreign exchange market.

A Foreign Exchange (FX) Transaction is an agreement between you and currency to exchange one currency for another at an agreed exchange rate on an agreed date. It

provides you with protection against unfavorable exchange rate movements. A forex market transaction may be useful in managing the currency risk associated with exporting or importing goods denominated in foreign currency, investing or borrowing overseas, repatriating profits, converting foreign currency denominated dividends, or settling other foreign currency contractual arrangement.

6.3 FACTORS INFLUNCEING FOREIGN MARKET TRANSACTIONS

Some of the factors that influence currency supply and demand are balance of payments, inflation rates, interest rates economic growth and political and economic risks.

1. **Balance of Payments:** Foreign exchange rate is the price of one currency in terms of another. The balance of payments summarizes the flow of economic transactions between residents of a given country and the residents of other countries during a certain period of time. Balance of payments represents the demand and supply of foreign exchange which ultimately determine the value of the currency. When the balance of payments of a country is continuously deficit, it implies that the demand for the currency of the country is lesser than its supply. Therefore, its value in the market declines. If the balance of payments is surplus continuously, it shows that the demand for the currency in the exchange market is higher than its supply and therefore the currency gains value.

2. **Relative Inflation Rates:** Suppose the supply of dollars increases relative to its demand. This excess growth in the money supply will cause inflation in the US, which means that US prices will begin to rise relative to prices of German goods and services, German consumers to buy fewer US products and begin switching to German substitutes leading to a decrease in the amount of Euros supplied at every exchange rate. Similarly higher prices in the United States will lead American consumers to substitute German imports for U.S. products, resulting in an increase in the demand for Euros. In effect both Germans and Americans are searching for the best deals worldwide and will switch their purchases accordingly. Hence a higher rate of inflation in the United States than in Germany will simultaneously increase German exports to the United States and reduce U.S. exports to Germany.

3. **Relative Interest rates:** Interest rate differentials will also affect the equilibrium exchange rate. A rise in US interest rates relative to German rates all else being equal, will cause investors in both nations to switch from euro to dollar-denominated

securities to take advantage of the higher dollar rates. The net result will be depreciation of the euro in the absence of government intervention. It should be noted that the interest rates discussed here are real interest rates. The real interest rate equals the nominal or actual interest rate minus the rate of inflation. The distinction between nominal and real interest rates is critical in international finance. If the increase in U.S. rates relative to German rates just reflects higher U.S. inflation, the predicted result will be a weaker dollar. Only an increase in the real U.S. rate relative to the real German rate will result in an appreciating dollar.

6.4   TYPES OF FOREIGN EXCHANGE TRANSACTIONS

A very brief account of certain important types of transactions conducted in the foreign exchange market is given below:

1)   Purchase and Sale Transactions:

The transaction in foreign exchange market is synonymous with commodity market. While a trader has to purchase goods from his suppliers which he sells to his customers, in a similar way the bank which is authorized to deal in foreign exchange purchases as well as sells its commodity the foreign currency. Therefore, the foreign currency can be considered as a commodity in foreign exchange dealings Whenever we talk about foreign exchange two points need to be kept in mind the transaction is always from the bank's point of view; and the item referred to is the foreign currency. Therefore, when we say a purchase, we imply that the bank has purchased; and it has purchased foreign currency. Similarly, when we say a sale, we imply that the bank has sold; and it has sold foreign currency. In a purchase transaction the bank acquires foreign currency and parts with home currency. In a sale transaction the bank parts with foreign currency and acquires home currency.

2)   Spot Market:

The term spot exchange refers to the class of foreign exchange transaction which requires the immediate delivery or exchange of currencies on the spot. In practice the settlement takes place within two days in most markets. The rate of exchange effective for the spot transaction is known as the spot rate and the market for such transactions is known as the spot market. The most common type of foreign exchange transaction is for immediate exchange so called spot rate. The market where these transactions occur is known as the spot market. The average daily foreign exchange trading by banks around the world now exceeds $1.5 trillion. The average daily foreign exchange trading in the

United States alone exceeds $200 billion. The spot transaction is the quickest and fastest way to actually exchange your currency. There is an exchange of two currencies over a two day period on the forex exchange, meaning that no contracts are signed. This allows the transaction to happen at a faster pace The spot foreign exchange purchase and sale is the service of spot foreign exchange purchases and spot foreign exchange sales. The spot foreign exchange purchase refers to the business where the designated outlet buys foreign exchange from institutional customers based on the spot exchange rate in the foreign exchange purchase and sale market, and pays the equivalent amount in RMB. The spot foreign exchange sale refers to the business where the designated outlet sells foreign exchange to institutional customers based on the spot exchange rate in the foreign exchange purchase and sale market, and collects the equivalent amount in RMB. It is applicable towards the domestic institutions and the other customers, and approved by the State Administration of Foreign Exchange.

3) Forward Market:

The forward transactions is an agreement between two parties, requiring the delivery at some specified future date of a specified amount of foreign currency by one of the parties, against payment in domestic currency be the other party, at the price agreed upon in the contract. The rate of exchange applicable to the forward contract is called the forward exchange rate and the market for forward transactions is known as the forward market. The foreign exchange regulations of various countries generally regulate the forward exchange transactions with a view to curbing speculation in the foreign exchanges market. In India, for example, commercial banks are permitted to offer forward cover only with respect to genuine export and import transactions. Forward exchange facilities, obviously, are of immense help to exporters and importers as they can cover the risks arising out of exchange rate fluctuations be entering into an appropriate forward exchange contract. With reference to its relationship with spot rate, the forward rate may be at par, discount or premium. If the forward exchange rate quoted is exact equivalent to the spot rate at the time of making the contract the forward exchange rate is said to be at par. The forward rate for a currency, say the dollar, is said to be at premium with respect to the spot rate when one dollar buys more units of another currency, say rupee, in the forward than in the spot rate on a per annum basis. The forward rate for a currency, say the dollar, is said to be at discount with respect to the spot rate when one dollar buys fewer rupees in the forward than in the spot market. The discount is also usually expressed as a percentage deviation from the spot rate on a per annum basis. The forward exchange rate is determined mostly be the demand for and supply of forward exchange. Naturally

when the demand for forward exchange exceeds its supply, the forward rate will be quoted at a premium and conversely, when the supply of forward exchange exceeds the demand for it, the rate will be quoted at discount. When the supply is equivalent to the demand for forward exchange, the forward rate will tend to be at par in the foreign exchange market.

4) Futures Market:

While a focus contract is similar to a forward contract, there are several differences between them. While a forward contract is tailor made for the client be his international bank, a future contract has standardized features the contract size and maturity dates are standardized. Futures cab traded only on an organized exchange and they are traded competitively. Margins are not required in respect of a forward contract but margins are required of all participants in the futures market an initial margin must be deposited into a collateral account to establish a futures position. The super-forward foreign exchange purchase and sale refers to the foreign exchange purchase and sale businesses with a value date of one year later. In other words, the customer appoints a delivery date that is one year later, and entrusts the bank to buy (or sell) RMB and sell (or buy) a certain foreign currency on the delivery date. The customer entrusts the bank to convert funds between RMB and a foreign currency based on the exchange rate specified in the agreement on a certain delivery rate. It decides a fixed exchange rate for a future delivery on the transaction date, and thus, fully locks up the currency exchange risks. These transactions are also forward transactions, and deal with contracts much like the normal forward transactions. The contracts usually deal with a certain amount by a certain date, rather than on a certain date. The contract lasts for the time specified, and are major on the forex market.

5) Options Market:

While the forward or futures contract protects the purchaser of the contract from the adverse exchange rate movements, it eliminates the possibility of gaining a windfall profit from favorable exchange rate movement. An option is a contract or financial instrument that gives holder the right, but not the obligation, to sell or buy a given quantity of an asset as a specified price at a specified future date. An option to buy the underlying asset is known as a call option and an option to sell the underlying asset is known as a put option. Buying or selling the underlying asset via the option is known as exercising the option. The stated price paid (or received) is known as the exercise or striking price. The buyer of an option is known as the long and the seller of an option is known as the

writer of the option, or the short. The price for the option is known as premium. A European option cab is exercised only at the maturity or expiration date of the contract, whereas an American option can be exercised at any time during the contract. Arbitrage is the simultaneous buying and selling of foreign currencies with intention of making profits from the difference between the exchange rate prevailing at the same time in different foreign market in India.

6.5   FOREIGN EXCHANGE QUOTATIONS

Spot market interaction among banks. At any given point in time, the exchange rate between two currencies should be similar across the various banks that provide foreign exchange services. If there is a large discrepancy, customersor other banks will purchase large amounts of a currency from whatever bank quotesa relatively low price and immediately sell it to whatever bank quotes a relatively high price. Such actions cause adjustments in the exchange rate quotations that eliminate any discrepancy. Bid/Ask Spread of Banks. Commercial banks charge fees for conducting foreign exchange transactions. At any given point of time, a bank's bid (buy) quote for a foreign currency will be less than its ask (sell) quote. The bid/ask spread represents the differential between the bid and ask quotes and is intended to cover the costs in volvedin accommodating requests to exchange currencies. The bid/ask spread is normally expressed as a percentage of the ask quote. Exchange rate quotations for widely traded currencies are published in The Wall Street Journal and in business sections of many newspapers on a daily basis. With some exceptions, each country has its own currency. In 1999, several European countries(including Germany, France, and Italy) adopted the euro as their new currency for commercial transactions, replacing their own currencies.

6.6   METHODS OF QUOTATIONS

The following are the major methods of quotations:

♦   **Direct Quotations:** Under direct quotation the bank buys the foreign currency at lower price and selling it to a customer at a higher price. For instance a bank may buy US dollar at ₹46 and sell at 46.20 and thus book a profit. Therefore, under direct quotation the maxim is buy low; Sell high. The quotation under Method I, in which exchange rate is expressed as the price per unit of one US dollar in terms of the home currency is known as home currency quotation or 'direct Quotation'. It may be noted that under direct quotation the number of units of foreign currency is kept constant and any change in the US dollar quoted at under different values of rupees.

A direct quote expresses the exchange rate in terms of home currency per unit of the foreign currency. For **Ex: 70 = 1 USD** (first home currency and then foreign currency, indicates INR required to buy or sell USD.

♦ **Indirect Quotation:** In the case of indirect quotations, while buying, the bank would acquire more units of foreign currency for a fixed unit of home currency and while selling part with lesser units of foreign currency for more units of home currency. Therefore, the maxim under indirect quotation is buy high and sell low. The home currency is kept constant and the exchange rate is expressed as so many units of foreign currency for a fixed unit of home currency is known as foreign currency quotation' or Indirect Quotation'. Under indirect quotation, any change in exchange rate will be effected by changing the number of units of foreign currency. The indirect quotation is used in London foreign exchange market. In New York and other foreign exchange markets mostly the direct method is in vogue. In India, earlier we had used indirect method. However, from August 2, 1993, India has switched over to direct method of quotation. The change has been introduced in order to simplify and establish transparency in exchange rates in India.

An indirect quote expresses the exchange rate in terms of foreign currency per unit of home currency. It is the number of units of foreign currency required to buy or sell one unit of home currency. For **Ex: 1 USD = 70** (first foreign currency and then home currency)

Illustrations on Indirect Quotation or Inverse Rate or Implied Rate

1. **The following quotes are available in the market USD / INR = 50 / 52, Find out Indirect quote of INR/ USD?**

Given: USD / INR = 50 / 52

INR / USD = ?

$$(INR/USD)bid = \frac{1}{(USD / INR) \, ask} = \frac{1}{52} = 0.0192$$

$$(INR/USD)ask = \frac{1}{(USD / INR) \, bid} = \frac{1}{50} = 0.0200$$

Therefore, Indirect Quote of INR / USD = 0.0192 / 0.0200

2. **The following quotes are available in the market INR / GBP = 0.0121/ 0.0125, Find out Indirect quote of GBP / INR?**

Given: INR / GBP = 0.0121 / 0.0125

GBP / INR = ?

$$(GBP / INR)bid = \frac{1}{(INR / GBP)\ ask} = \frac{1}{0.0121} = 80$$

$$(GBP / INR)ask = \frac{1}{(INR / GBP)\ bid} = \frac{1}{0.0125} = 82.64$$

Therefore, Indirect Quote of GBP / INR = 80/82

♦ **Direct versus Indirect Quotations**: The quotations of exchange rates for currencies normally reflect the ask prices for large transactions. Since exchange rates change throughout the day, the exchange rates quoted in a newspaper reflect only one specific point in time during the day. Quotations that represent the value of a foreign currency in dollars (number of dollars per currency) are referred to as direct quotations. Conversely, quotations that represent the number of units of a foreign currency per dollar are referred to as indirect quotations. The indirect quotation is there ciprocal of the corresponding direct quotation

♦ **For Example:** With a few exceptions, in the international markets, all rates are quoted in against US dollar. For instance, at Singapore Swiss Franc may be quoted at 1.5425/5440 and Japanese Yen at 104.67/70. This should be understood as:

USD 1 = CHF 1.5425 – 1.5440

USD 1 = JPY 104.67 – 104.70

While interpreting an international market quotation, we may do that either from the variable currency or the standard currency, the dollar. In the above quotation, in which Swiss Francs are received in exchange for dollars as: (a) purchase of Swiss Francs against Dollar or (b) sale of Dollar against Swiss Francs. For the sake of uniformity we will assume the standard currency as the currency being bought or sold. The quotation for Swiss Franc is CHF 1.5425 and CHF 1.5440 per Dollar. While buying dollar the quoting bank would part with fewer francs per dollar and while selling dollars would require as many francs as possible. Thus CHF1.5425 is the dollar buying rate and CHF1.5440 is the dollar selling rate. It may be observed that when viewed from dollar the exchange quotation partakes the character of a direct quotation and the maxim buy low; Sell high's applicable. We will denote such rates as dollar/Foreign Currency Rates', implying that dollar is being bought or sold against foreign currency.

- **Cross Rates Quotations:** A cross rate may be defined as an exchange rate which is calculated from two (or more) other rates. Thus the rate for the Deutschmark to the Swedish crone will be derived as the cross rate from the US dollar to the Deutschmark and the US dollar to the crone. The practice in world foreign exchange market is that currencies are quoted against the US dollar. If one bank asks another bank for its Deutschmark rate, that rate will be quoted against the US dollar unless otherwise specified. Most dealings are done against the US dollar hence it follows that the market rate for a currency at any moment is most accurately reflected in its exchange rate against the US dollar. A bank that was asked to quote sterling against the Swiss franc would normally do so by calculating this rate from the sterling/ dollar rate and the dollar/Swiss franc rate. Thus, the cross rates would be used to determine the quotations in foreign exchange market.

Illustrations:

1.   If a Peso is worth $ 0.07 and c $ is worth $ 70. What is the peso in c $?

$$\frac{\text{Value of Currency A in \$}}{\text{Value of Currency B in \$}}$$

1 Peso = $ 0.07

1 C$ = $ 0.70

Peso in C $ = 0.07 / 0.70

1 Peso = 0.10 C $.

Note: Formula is used only if both the country currency is given in $.

2.   Calculate the cross rates between IEP / GBP, if exchange rate between

USD / GBP = 1.6545 / 1.6552

USD / IEP = 1.3655 / 1.3665

A / C = A / B X B / C

IEP / GBP = IEP / USD x USD / GBP

Bid

$$(\text{IEP / GBP})\text{bid} = \frac{1}{(\text{USD / IEP}) \text{ ask}} \quad X \quad \frac{\text{USD}}{\text{GBP (bid)}}$$

$$\frac{1}{1.3665} = 1.6545$$

(IEP / GBP)bid = 1.2107

Ask

(IEP / GBP) ask = $\dfrac{1}{\text{(USD / IEP) bid}_{GBP}} \times \dfrac{USD}{\text{(ask)}}$

= $\dfrac{1}{1.3665} = 1.6552$

(IEP / GBP) ask =1.2121

Therefore, IEP / GBP = 1.2107 / 1.2121

3.   Calculate the cross rates between DM / GBP if exchange rates are:

DM / USD = 1.6505 / 1.6510

USD / GBP = 1.4524 / 1.4530

A / C = A / B X B / C

DM / GBP = DM / USD x USD / GBP

Bid:

(DM / GBP) bid = 1.6505 x 1.4524

                = **2.3971**

Ask:

(DM / GBP) ask= 1.6510 x 1.4530

                = **2.3989**

DM / GBP = 2.3971 / 2.3989

6.7   FOREIGN EXCHANGE ARBITRAGE

Exchange rate arbitrage is the practice of taking advantage of inconsistent exchange rates in different markets by selling in one market and simultaneously buying in another. Arbitrageurs do not take risks or, at least, it is not their intention to do so. In other words, they endeavour to maintain closed positions at all times. Rates of profit on arbitrage operations are necessarily low in competitive, well-informed markets, but since

transactions are usually very large, absolute profits may also be large from successful arbitrage. Arbitrage performs the function for a market system of bringing prices in one market into line with those in other markets. There are two types of arbitrage of relevance to forex markets: exchange rate arbitrage and interest rate arbitrage. In exchange rate arbitrage, advantage is taken of differentials in the price of a currency in different markets. Exchange rate arbitrage transactions may be classified in terms of the number of markets involved. Thus, we may have two-point and three-point arbitrage.

Arbitrage traditionally has been defined as the purchase of assets or commodities on one market for immediate resale on another in order to profit from a price discrepancy. In recent years however arbitrage has been used to describe a broader range of activities. The concept of arbitrage is of particular importance in International finance because so many of the relationships between domestic and international financial markets, exchange rates, interest rates and inflation rates depend on arbitrage for their existence. In fact it is the process of arbitrage that ensures market efficiency.

The purchase of currencies on one market for immediate resale on another in order to profit from the exchange rate differential is known as currency arbitrage. If perfect conditions prevail in the market, the exchange rate for a currency should be the same in all centers. Until recently, the pervasive practice among bank dealers was to quote all currencies against the US dollar when trading among them. Now, however, a growing percentage of currency trades don't involve the dollar. For example Swiss banks may quote the Euro against Swiss franc, and German banks may quote pound sterling in terms of Euros. Exchange traders are continually alert to the possibility of taking advantage, through currency arbitrage transactions, of exchange rate inconsistencies in different money centers. These transactions involve buying a currency in one market and selling it in another. Such activities tend to keep exchange rates uniform in the various markets.

6.8   METHODS OF ARBITRAGE PROCESS

1)   Two-point arbitrage:

It concerns two currencies in two geographically separated markets. For example, let the spot exchange rate be £1 = $1.55 in London and £1 = $1.60 in New York. Here we are quoting both exchange rates against sterling. That is, we are quoting GBP/USD. This is the indirect quotation of sterling and the direct quotation of the dollar. Remember that the expression Currency A/Currency B gives you the amount of Currency B that

exchanges for one unit of currency A. In practice, most exchange rates are quoted against the US dollar. If we were to do this, we would quote:

In London: USD/GBP £0.645

In New York: USD/GBP £0.625.

Thus, in relative terms, sterling is undervalued in London and overvalued in New York. Provided that capital was free to flow between the two centres, arbitrageurs would attempt to exploit, and hence profit from, the differential by selling dollars for pounds in London and reselling the pounds in New York. Assume the arbitrageur sold $1 million in London. For this, he would have received £645,161.29. Selling this in New York would have returned him £1,032,258.06 - a profit of 5 cents per £1. The sale of dollars in London would have strengthened sterling and pushed the value of the pound above $1.55. At the same time, the sale of sterling in New York would have caused sterling to weaken there, pushing its value below $1.60. The action of arbitrageurs would bring the rates of exchange in the two centres together. In practice, the rates wouldn't come exactly into line because of the existence of transactions costs, but the rates should move to being 'transactions costs close'. There is another simplification in the above example since no regard is paid to the existence of bid and offer rates of exchange. In the real world, the rates may have been such as

London: GBP/USD Bid 1.5495 Offer 1.5505

New York: GBP/USD Bid 1.5995 Offer 1.6005

Selling dollars in London, the arbitrageur would have been quoted the offer rate of 1.5505 and, thus, would have received £644,953.24. Buying dollars in New York, the arbitrageur would have been quoted the bid rate of 1.5995 and would have received £1,031,602.71. That is, the profits would have been lower because of the bid-offer spread in foreign exchange market.

2) Three-point (triangular) arbitrage:

Exchange rates may be externally consistent but internally inconsistent. That is, exchange rates among different currencies may be mutually inconsistent. Arbitrageurs will then attempt to profit from these inconsistencies and in the process will eliminate discrepancies and establish mutually consistent cross-exchange rates. A cross-exchange rate is simply the price of a second currency expressed in terms of a third or an exchange rate calculated from two other rates. For example, the rate of the Euro against the Swedish krona derived as the cross rate from US$ - Krona and US$ against the Euro. Consider the following market rates:

USD/CHF (Swiss francs against the US dollar)

1.6639-46 ($1 = SwFr 1.6639-1.6646)

EUR/USD (US dollar against the Euro)

0.9682-86 (€1 = $0.9682-0.9686)

These two exchange rates to calculate the cross-rate of exchange of Swiss francs against the Euro. To do this, we must multiply the same side of each exchange rate. Thus we get: 1.6639 x 0.9682 gives us Bid rate €1 = SwFr 1.6110 1.6646 x 0.9686 gives us Offer rate €1 = SwFr 1.6123 That is, we have: EUR/CHF 1.6110-23 If you wish to see how this works, you can work through the various stages. The bid rate is the rate at which the bank bids for Euros. That is, the rate at which the bank buys Euros. Therefore, it applies to the case where a client is selling Euros to the bank in exchange for Swiss dollars. Therefore, start with €1,000,000 and sell them for US dollars. The bank will buy dollars for Euros at a rate of €1 = 0.9682 and the client obtains $968,200. Then, the client sells dollars for Swiss francs. The bank is now buying dollars and will pay only SwFr1.6639 for each dollar and the client obtains SwFr1,610,988, which gives a rate of exchange of €1 = SwFr1.6110 when rounded to four decimal places.

The offer rate is the rate at which the bank sells (offers) Euros. Therefore, this applies to the case where the client is selling Swiss francs and buying Euros. Now we start with SwFr 1 million and sell them for dollars. The bank will demand SwFr1.6646 for each dollar and so we have $600,744.92. We then sell them for Euros but the bank now will pay us only €1/0.9686 for each dollar (that is, €1.0324). Therefore, we need to divide $600,744.92 by 0.9686 and this gives us €620,219.82 and we have an exchange rate of SwFr1 = €0.62022. However, we wish to know how many Swiss francs we can get for one Euro and so we need the reciprocal of this, which is 1.6123.

This particular way of calculating the cross-rate (multiplying the same side of each exchange rate) is needed because we started with one rate in which the dollar was quoted indirectly (USD/CHF) and one where the dollar was quoted directly (EUR/USD). Had we started off with two indirect quotations, the process would have been different. We would have had: USD/CHF 1.6639-46 USD/EUR 1.0324-28 Then we would have had to cross-divide the two exchange rates: 1.0328 ÷ 1,6639 = 0.6207 and the reciprocal is 1.6110 and 1.0324 ÷ 1.6646 = 0.6202, whose reciprocal is 1.6123.

3)   Interest rate arbitrage:

This is the simultaneous exploitation of interest rate differentials in one or more markets for profit. Arbitrageurs may either transfer their own capital from one market

to another or simultaneously borrow in one market and lend in another. Interest rate arbitrage is based upon the principle of interest rate parity, which, as we have seen in our discussion of forward exchange rates, is expressed by: the difference in interest rates = difference between spot and forward rates of exchange:

$(f0 - s0)/s0 = (i€ - i£)/(1 + i£)$

where f0 is the forward rate of exchange of the foreign currency (euros) against the home currency (sterling); s0 is the spot rate of exchange between the two currencies. i€ is the interest rate on the foreign currency; and i£ is the interest rate on the home currency. Consider the following interest arbitrage example. An investor has £1m to invest for 12 months. GBP/EUR exchange rates are: Spot £1 = €1.6231 (taking the mid-point between the bid and offer rates); 12 months' forward £1 = €1.5871. Money market interest rates for 12 months are: on sterling 6.81%; on the Euro 4.28%. The sterling investment would yield £1,068,100; the € investment plus the forward purchase of £ gives £1,066,453. Allow for transactions costs (which we have not done since we have ignored the bid-offer spreads) and one can see that there are no arbitrage.

6.9 CASE STUDY

1.   The following quote are available in Amstar Dam EUR / USD = 0.8875/85

$$1\text{month} = 15 / 21$$

$$2\text{month} = 18 / 28$$

$$3 \text{ month} = 23 / 33$$

a)   Calculate out right forward rate.

b)   Calculate the percentage of annual derivation from the spot rate in case of 2months forward.

c)   What is USD / EUR quotation for 3 months forward.

d)   Support an investor wishes to buy 3 months forward 100,000 dollars. How much Euro we should pay.

e)   Suppose an investor wishes to buy 1 month forward 50000 Euros. How much dollar he should pay. Assume exchange margin 0.0151%.

2. A New York quote the following rate GBP / USD spot = 1.6540 /50, In Bank London quote USD / GBP spot = 0.6030 /35, Is there any arbitrager opportunity. How would it will be in implemented how much is profit?

6.10 NOTES

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6.11 SUMMARY

Forex (FX) is the market in which currencies are traded. The forex market is the largest, most liquid market in the world. There is no central marketplace for currency exchange; trade is conducted over the counter. The forex market is open 24 hours a day, five days a week, except for holidays, and currencies are traded worldwide among the major financial centers of London, New York, Tokyo, Zurich, Frankfurt, Hong Kong, Singapore, Paris and Sydney. The forex is the largest market in the world in terms of the total cash value traded, and any person, firm or country may participate in this market. In this regard, this unit covers types of transactions. It also explains direct and indirect quotations. Further, this unit throws light on arbitrage.

6.12   SELF ASSESSMENT QUESTIONS

1.   What is Foreign Exchange Market?

2.   Discuss the factors influencing foreign exchange transactions

3.   Differentiate between direct and indirect quotation.

4.   Explain the process of arbitrage?

6.13 KEY WORDS

BOP

Inflation

Spot Market

Forward Market

Futures Market

Options Market

Direct Quote

Indirect Quote

Cross Quote

Arbitrage

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UNIT-7 :FOREIGN EXCHANGE MARKET IN INDIA

Structure :

7.0   OBJECTIVES

After studying this unit, you should be able to;

- define the term foreign exchange Market.

- describe the brief historical background of foreign exchange market in India.

- discuss on settlement dates of foreign exchange market

7.1   INTRODUCTION

Foreign Exchange Market in India operates under the Central Government of India and executes wide powers to control transactions in foreign exchange. The Foreign Exchange Management Act, 1999 or FEMA regulates the whole Foreign Exchange Market in India. Before the introduction of this act, the foreign exchange market in India was regulated by the Reserve Bank of India through the Exchange Control Department, by the Foreign Exchange Regulation Act or FERA, 1947. After independence, FERA was introduced as a temporary measure to regulate the inflow of the foreign capital. But with the Economic and Industrial development, the need for conservation of foreign currency was urgently felt and on the recommendation of the Public Accounts Committee, the Indian government passed the Foreign Exchange Regulation Act, 1973 and gradually, this act became famous as FEMA.

Since 1991, the rigid, four-decade old, fixed exchange rate systemreplete with severe import and foreign exchange controls and a thriving black market isbeing replaced with a less regulated, "market driven" arrangement. While the rupee isstill far from being "fully floating" (many studies indicate that the effective pegging is noless marked after the reforms than before), the nature of intervention and range ofindependence tolerated have both undergone significant changes. With an overabundanceof foreign exchange reserves, imports are no longer viewed with fear andskepticism. The Reserve Bank of India and its allies now intervene occasionally in theforeign exchange markets not always to support the rupee but often to avoid an appreciation in its value. Full convertibility of the rupee is clearly visible in the horizon.The effects of these developments are palpable in the explosive growth in the foreignexchange market in India.

7.2 HISTORICAL BACKGROUND OF FOREGIN EXCHANGE MARKET IN INDIA

Indian forex market since independence can be grouped in three distinct phases.

1947 to1977:

During 1947 to 1971, India exchange rate system followed the par value system. RBI fixed rupee's external par value at 4.15 grains of fine gold. 15.432grains of gold is equivalent to 1 gram of gold. RBI allowed the par value to fluctuate within the permitted margin of ±1 percent. With the breakdown of the Bretton Woods System in 1971 and the floatation of major currencies, the rupee was linked with Pound-Sterling. Since Pound-Sterling was fixed in terms of US dollar under the Smithsonian Agreement of 1971, the rupee also remained stable against dollar.

1978-1992:

During this period, exchange rate of the rupee was officially determined in terms of a weighted basket of currencies of India's major trading partners. During this period, RBI set the rate by daily announcing the buying and selling rates to authorized dealers. In other words, RBI instructed authorized dealers to buy and sell foreign currency at the rate given by the RBI on daily basis. Hence exchange rate fluctuated but within a certain range. RBI managed the exchange rate in such a manner so that it primarily facilitates imports to India. the FERA Act was part of the exchange rate regulation practices followed by RBI.

India's perennial trade deficit widened during this period. By the beginning of 1991, Indian foreign exchange reserve had dwindled down to such a level that it could barely be sufficient for three-week's worth of imports. During June 1991, India airlifted 67 tons of gold, pledged these with Union Bank of Switzerland and Bank of England, and raised US$ 605 millions to shore up its precarious forex reserve. At the height of the crisis, between 2nd and 4th June 1991, rupee was officially devalued by 19.5% from 20.5 to 24.5 to 1 US$. This crisis paved the path to the famed "liberalization program" of government of India to make rules and regulations pertaining to foreign trade, investment, public finance and exchange rate encompassing a broad gamut of economic activities more market oriented.

1992 onwards:

1992 marked a watershed in India's economic condition. During this period, it was felt that India needs to have an integrated policy combining various aspects of trade,

industry, foreign investment, exchange rate, public finance and the financial sector to create a market-oriented environment. Many policy changes were brought in covering different aspects of import-export, FDI, Foreign Portfolio Investment etc. One important policy changes pertinent to India's forex exchange system were brought in rupees was made convertible in current account. This paved to the path of foreign exchange payments/ receipts to be converted at market-determined exchange rate. However, it is worthwhile to mention here that changes brought in by government of India to make the exchange rate market oriented have not happened in one big bang. This process has been gradual.

7.3   THE FEMA FEATURES

1. Activities such as payments made to any person outside India or receipts from them, along with the deals in foreign exchange and foreign security is restricted. It is FEMA that gives the central government the power to impose the restrictions.

2. Restrictions are imposed on residents of India who carry out transactions in foreign exchange, foreign security or who own or hold immovable property abroad.

3. Without general or specific permission of the MA restricts the transactions involving foreign exchange or foreign security and payments from outside the country to India – the transactions should be made only through an authorised person.

4. Deals in foreign exchange under the current account by an authorised person can be restricted by the Central Government, based on public interest generally.

5. Although selling or drawing of foreign exchange is done through an authorized person, the RBI is empowered by this Act to subject the capital account transactions to a number of restrictions.

6. Residents of India will be permitted to carry out transactions in foreign exchange, foreign security or to own or hold immovable property abroad if the currency, security or property was owned or acquired when he/she was living outside India, or when it was inherited by him/her from someone living outside India.

7. Exporters are needed to furnish their export details to RBI. To ensure that the transactions are carried out properly, RBI may ask the exporters to comply to its necessary requirements.

7.4 FOREIGN EXCHANGE MARKET IN INDIA

Foreign exchange market is described as an OTC (Over the counter) market as there is no physical place where the participants meet to execute their deals. It is more an informal arrangement among the banks and brokers operating in a financing centre purchasing and selling currencies, connected to each other by tele communications like telex, telephone and a satellite communication network, SWIFT. The term foreign exchange market is used to refer to the wholesale a segment of the market, where the dealings take place among the banks. The retail segment refers to the dealings take place between banks and their customers. The retail segment refers to the dealings take place between banks and their customers. The retail segment is situated at a large number of places. They can be considered not as foreign exchange markets, but as the counters of such markets.

The leading foreign exchange market in India is Mumbai, Calcutta, Chennai and Delhi is other centers accounting for bulk of the exchange dealings in India. The policy of Reserve Bank has been to decentralize exchages operations and develop broader based exchange markets. As a result of the efforts of Reserve Bank Cochin, Bangalore, Ahmadabad and Goa have emerged as new centre of foreign exchange mark

The markets are situated throughout the different time zones of the globe in such a way that when one market is closing the other is beginning its operations. Thus at any point of time one market or the other is open. Therefore, it is stated that foreign exchange market is functioning throughout 24 hours of the day. However, a specific market will function only during the business hours. Some of the banks having international network and having centralized control of funds management may keep their foreign exchange department in the key centre open throughout to keep up with developments at other centers during their normal working hours

In India, the market is open for the time the banks are open for their regular banking business. No transactions take place on Saturdays.

7.5 CURRENCIES TRADED

In most markets, US dollar is the vehicle currency, viz., the currency used to denominate international transactions. This is despite the fact that with currencies like Euro and Yen gaining larger share, the share of US dollar in the total turnover is shrinking. The following table represents the important currencies in the market.

Important Currencies

USD	US Dollar
AUD	Australia Dollar
CAD	Canada Dollar
EUR	Euro
CHF	Switzerland Franc
EGP	Egypt Pound
GBP	United Kingdom Pound
HKD	Hong Kong Dollar
ILS	Israel Shekel
INR	India Rupee
IQD	Iraq Dinar
JMD	Jamaica Dollar
JOD	Jordan Dinar
JPY	Japanese Yen
FRF	French Franc
KWD	Kuwait Dinar
LKR	Sri Lanka Rupee
LRD	Liberia Dollar
MXN	Mexico Peso
SAR	Saudi Riyal
THB	Thailand Baht

7.6 PHYSICAL MARKETS

In few centers like Paris and Brussels, foreign exchange business takes place at a fixed place, such as the local stock exchange buildings. At these physical markets, the banks meet and in the presence of the representative of the central bank and on the basis of bargains, fix rates for a number of major currencies. This practice is called fixing. The rates thus fixed are used to execute customer orders previously placed with the banks. An advantage claimed for this procedure is that exchange rate for commercial transactions will be market determined, not influenced by any one bank. However, it is

observed that the large banks attending such meetings with large commercial orders backing up, tend to influence the rates.

7.7 SETTLEMENT OF TRANSACTIONS

Foreign exchange markets make extensive use of the latest developments in telecommunications for transmitting as well settling foreign exchange transaction, Banks use the exclusive network SWIFT to communicate messages and settle the transactions at electronic clearing houses such as CHIPS at New York.

1. SWIFT:

SWIFT is a acronym for Society for Worldwide Interbank Financial Telecommunications, a co operative society owned by about 250 banks in Europe and North America and registered as a co-operative society in Brussels, Belgium. It is a communications network for international financial market transactions linking effectively more than 25,000 financial institutions throughout the world that have been allotted bank identified codes. The messages are transmitted from country to country via central interconnected operating centers located in Brussels, Amsterdam and Culpeper, Virginia. The member countries are connected to the centre through regional processors in each country. The local banks in each country reach the regional processors through the national net works. The SWIFT System enables the member banks to transact among themselves quickly (i) international payments (ii) Statements (iii) other messages connected with international banking. Transmission of messages takes place within seconds, and therefore this method is economical as well as time saving. Selected banks in India have become members of SWIFT. The regional processing centre is situated at Mumbai.

2. CHIPS:

CHIPS stands for Clearing House Interbank Payment System. It is an electronic payment system owned by 12 private commercial banks constituting the New York Clearing House Association. A CHIP began its operations in 1971 and has grown to be the world's largest payment system. Foreign exchange and Euro dollar transactions are settled through CHIPS. It provides the mechanism for settlement every day of payment and receipts of numerous dollar transactions among member banks at New York, without the need for physical exchange of cheques/funds for each such transaction. It may be noted that settlement of transactions in the New York foreign exchange market takes place in two stages, First clearance at CHIPS and arriving at the net position for each

bank. Second, transfer of Fedfunds for the net position. The real balances are held by banks only with Federal Reserve Banks (Fedfunds) and the transaction is complete only when Fedfunds are transferred. CHIPS help in expediting the reconciliation and reducing the number of entries that pass through Fedwire.

3.   CHAPS:

It is an arrangement similar to CHIPS that exists in London. CHAPS stands for Clearing House Automated Payment System.

4.   Fedwire:

The transactions at New York foreign exchange market ultimately get settled through Fedwire. It is a communication network that links the computers of about 7000 banks to the computers of Federal Reserve Banks. The fedwire funds transfer system, operate by the Federal Reserve Bank, are used primarily for domestic payments, bank to bank and third party transfers such as interbank overnight funds sales and purchases and settlement transactions. Corporate to corporate payments can also be made, but they should be effected through banks. Fed guarantees settlement on all payments sent to receivers even if the sender fails.

7.8   SETTLEMENT DATES FOR SPOT TRANSACTIONS

In a spot transaction, the settlement or value date is usually two business days ahead for European currencies and Asian currencies traded against the dollar. This rule of two days ahead is only in case of trade locations falling in two different zones. Thus, if a London bank sells Yen against dollar to a Paris bank on a Monday, the London Bank will turn over a Yen deposit to the Paris bank on the following Wednesday and the Paris bank will transfer a dollar deposit to the London bank on the same day.

If weekends happens to be bank holidays, as per the two business days ahead rule, deals done on a Thursday will be cleared the following Monday while deals done on Friday will have Tuesday of the following week as the value date if Saturday and Sunday are bank holidays.

7.9   SETTLEMENT DATES FOR FORWARD TRANSACTIONS

A one month or 30 day forward purchase of say pounds against rupees, the rate of exchange is fixed on the transaction date, the value date is arrived at as follows:

a.   First find the value date for a spot transaction between the currencies done on the same day;

b.   Then add one calendar month to arrive at the value date.

c.   Thus, for one month forward transaction entered into on say June 20, the corresponding spot value date is June 22 and one month forward value date is Juny 22. Two months forward would be August 22.

7.10 CASE STUDY

1.   A New York quote the following rate GBP / USD spot = 1.6540 /50, In Bank London quote USD / GBP spot = 0.6030 /35, Is there an arbitrager opportunity. How would it will be in implemented how much is profit?

2.   The following Spot price are observed in New York market.

USD / CHF = 1.6345 / 50

USD / JPY = 125.35/45

In the Jenevamarket ,

CHF / JPY spot is being quoted at 74.64/85

In there any arbitrage opportunity.

7.11 NOTES

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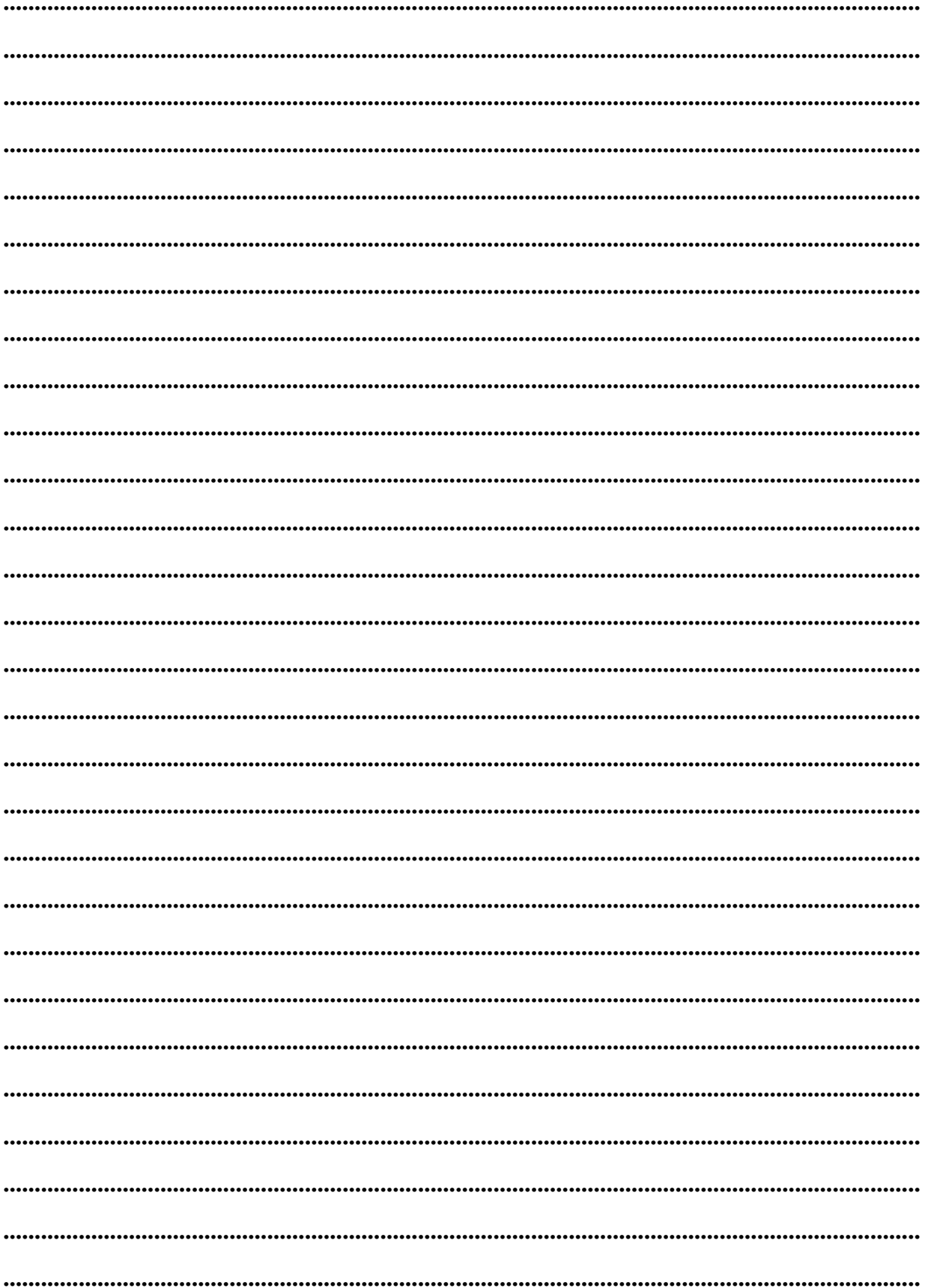..

7.12 SUMMARY

This unit discussed about the foreign exchange market in India, FEMA features, settlement of transactions in spot and forward market. Further this unit highlighted the overview of Foreign Exchange Market in India.

7.13 KEY WORDS

FEMA

Currencing

SWIFT

CHIPS

CHAPS

SPOT

Forward

7.14 SELF ASSESSMENT QUESTIONS

1. Elaborate on foreign exchange market in India.

2. Discuss the features of FEMA.

3. How settlement of transaction takes place in spot and forward market?

7.15 REFERENCES

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UNIT-8 : SPOT AND FORWARD RATES

Structure :

8.0 OBJECTIVES

After studying this unit, you should be able to;

- understand the term spot and forward rates.

- elaborate on factor determining spot exchange rate.

- describe the arbitrage in spot market.

8.1 INTRODUCTION

Forex rates can be quoted as spot or forward contracts. When buyers and sellers agree to trade at the current exchange rate for immediate delivery, it is known as spot transaction or cash transaction. The word "immediate" has different meaning in this case. In forex market parlance, the trade date is the day on which both parties agree to buy and sell. The settlement date/value date is the day on which funds are actually transferred between the buyer and seller. On settlement/value date, the buying or selling actions will be realized by settlement of payment and receipt. Depending upon the gap between trade and value date, spot forex trading can either be categorized as cash, tom or spot transaction.

8.2 SPOT TRANSACTIONS

When a person goes to bank and buys one currency by paying another currency is an example of spot transaction (or spot delivery) and the rate quoted by the bank is the spot rate. For example, in India, some hotels buy or sell foreign currency over the counter. Normally the hotel/antique shops will have a display board mentioning different INR rates for different currency. Any guest visiting the hotel can buy or sell foreign currency at the rate displayed on the board. This is an example of cash transaction where the trade date and settlement date coincide. Similarly in the interbank market, banks & financial institutions buy and sell currencies at a rate prevailed on the trade date. However, the actual settlement for the agreed amount may take place on T+1 or latest by T+2 days. With the advance in communication technology and electronic fund transfer mechanism, settlement date is narrowing down to trade date.

8.3 TYPES OF SETTLEMENT UNDER SPOT TRANSACTION

In India, the delivery under a spot transaction can be settled as ready/cash, Tom or Spot as given in Table 8.1.

Table 8.1

Types of Settlement under Spot Transaction

Ready or cash	The transaction to be settled on the same day
Tom	The delivery of foreign exchange to be made on the day next (tomorrow) to the date of transaction.
Spot	Delivery of foreign exchange would take place on the 2nd working day from the trade date.

8.4 ARBITRAGE IN SPOT MARKETS

Arbitrage is the simultaneous buying and selling of foreign currencies with intention of making profits from the difference between the exchange rate prevailing at the same time in different markets

Illustrations:

1. A New York quote the following rate GBP / USD spot = 1.6540 /50, In Bank London quote USD / GBP Spot = 0.6030 /35, Is there an arbitrager opportunity. How would it will be in implemented how much is profit?

Solution :

New York = GBP / USD spot = 1.6540/ 1.6550

London = USD / GBP spot = 0.6030/ 0.6035

London = GBP /USD spot = ?

GBP /USD spot = $\dfrac{1}{0.6035} \Big/ \dfrac{1}{0.6030}$

GBP /USD 1.6570 / 1.6583

Therefore,

New York = GBP / USD spot =1.6540 / 1.65501

London   = GBP /USD spot =1.6570 / 1.6583

In New York, the bank will buy GBP at 1.6540 and sell GBP at 1.6550 per GBP.

In bank B, the bank will buy paying 1.6570dollar and sell GBP by receiving 1.6583 dollar per GBP.

We have to analyze arbitrage opportunity by

1.	Buying GBP in bank 'B' and selling it in bank A

2.	Buying GBP in bank 'A' and selling it in bank 'B'

3.	Supporting the investor has 1GBP, if he sell that GBP in Bank 'A' then he gets 1.6540. If he sells the same dollar in bank 'B' he is not in a position to get back 1 GBP. Because dollars selling price is more in bank 'B''

Therefore there is no arbitrage opportunity.

2.	The following Spot price are observed in New York market.

USD / CHF = 1.6345 / 50

USD / JPY = 125.35/45

In the Jenevamarket ,

CHF / JPY spot is being quoted at 74.64/85

In there any arbitrage opportunity.

Solution A/B X A/C is given as B/C = $\dfrac{A/C}{A/B}$

 USD / CHF = 1.6345 / 1.6350

USD / JPY = 125.35/ 125.45

CHF / JPY = $\dfrac{USD / JPY}{USD / CHF}$

$$CHF / JPY = \frac{125.35}{1.6345} \Big/ \frac{125.45}{1.6350}$$

CHF / JPY = 76.6901 / 76.7278

CHF / JPY = 74.6500/74.8500

There are 2 alternative

a.   The investor can buy JPY in New york and sell the same in Jeneva market.

b.   He can buy JPY in Jeneva Market and sell the same in New York market.

The investor can buy 74.6500 JPY by paying CHF in Jeneva with that amount he can't buy same CHF in Newyork in the CHF selling rate is 76.7278 JPY.

The buying rate of CHF is more than the selling rate of CHF. Therefore there is no arbitrage opportunity.

Alternatively, the arbitrager can sell 76.6901 JPY buy paying 1 CHF in Newyork and by paying 1 CHF in Newyork and buy the same CHF in Jeneva buy paying 74.8500 JPY.

By this he could save some amount JPY. Therefore there is arbitrager opportunity

The arbitrage profit is =76.6901-74.8500

                   =1.8401JPY

8.5   FACTORS DETERMINING SPOT EXCHANGE RATES

1. **Balance of Payments:**

Balance of Payments represents the demand for and supply of foreign exchange which ultimately determine the value of the currency. Exports, both visible and invisible, represent the supply side for foreign exchange. Imports, visible and invisible, create demand for foreign exchange. Put differently, export from the country creates demand for the currency of the country in the foreign exchange market. The exporters would offer to the market the foreign currencies they have acquired and demand in exchange the local currency. Conversely, imports into the country will increase the supply of the currency of the country in the foreign exchange market.

When the balance of payments of a country is continuously at deficit, it implies that the demand for the currency of the country is lesser than its supply. Therefore, its

value in the market declines. If the balance of payments is surplus continuously it shows that the demand for the currency in the exchange market is higher than its supply therefore the currency gains in value.

2. **Inflation:**

Inflation in the country would increase the domestic prices of the commodities. With increase in prices exports may dwindle because the price may not be competitive. With the decrease in exports the demand for the currency would also decline; this in turn would result in the decline of external value of the currency. It may be noted that unit is the relative rate of inflation in the two countries that cause changes in exchange rates. If, for instance, both India and the USA experience 10% inflation, the exchange rate between rupee and dollar will remain the same. If inflation in India is 15% and in the USA it is 10%, the increase in prices would be higher in India than it is in the USA. Therefore, the rupee will depreciate in value relative to US dollar.

The inflation has a definite influence on the exchange rates in the long run. The trend of exchange rates between two currencies has tended to hover around the basic rate discounted for the inflation factor. The actual rates have varied from the trend only by a small margin which is acceptable. However, this is true only where no drastic change in the economy of the country is. New resources found may upset the trend. Also, in the short run, the rates fluctuate widely from the trend set by the inflation rate. These fluctuations are accounted for by causes other than inflation.

3. **Interest rate:**

The interest rate has a great influence on the short – term movement of capital. When the interest rate at a centre rises, it attracts short term funds from other centers. This would increase the demand for the currency at the centre and hence its value. Rising of interest rate may be adopted by a country due to tight money conditions or as a deliberate attempt to attract foreign investment. Whatever be the intention, the effect of an increase in interest rate is to strengthen the currency of the country through larger inflow of investment and reduction in the outflow of investments by the residents of the country.

4. **Money Supply:**

An increase in money supply in the country will affect the exchange rate through causing inflation in the country. It can also affect the exchange rate directly. An increase in money supply in the country relative to its demand will lead to large scale spending on foreign goods and purchase of foreign investments. Thus the supply of the currency in

the foreign exchange markets is increased and its value declines. The downward pressure on the external value of the currency then increases the cost of imports and so adds to inflation. The effect of money supply on exchange rate directly is more immediate than its effect through inflation. While in the long run inflation seems to correlate exchange rate variations in a better way, in the short run exchange rates move more in sympathy with changes in money supply.

One explanation of how changes in money supply vary the exchange rate is this; the total money supply in the country represents the value of total commodities and services in the country. Based on this the outside world determines the external value of the currency. If the money supply is doubles, the currency will be valued at half the previous value so as to keep the external value of the total money stock of the country constant. Another explanation offered is that the excess money supply flows out of the country and directly exerts a pressure on the exchange rate. The excess money created, the extent they are in excess of the domestic demand for money, will flow out of the country. This will increase the supply of the currency and pull down its exchange rate.

5. **National Income:**

An increase in national income reflects increase in the income of the residents of the country. This increase in the income increases the demand for goods in the country. If there is underutilized production capacity in the country, this will lead to increase in production. There is a chance for growth in exports too. But more often it takes time for the production to adjust to the increased income. Where the production does not increase in sympathy with income rise, it leads to increased imports and increased supply of the currency of the country in the foreign exchange market. The result is similar to that of inflation, viz., and decline in the value of the currency. Thus an increase in national income will lead to an increase in investment or in consumption, and accordingly, its effect on the exchange rate will change. Here again it is the relative increase in national incomes of the countries concerned that is to be considered and not the absolute increase.

6. Capital Movements:

There are many factors that influence movement of capital from one country to another. Short term movement of capital may be influenced by the offer of higher interest in a country. If interest rate in a country rises due to increase in bank rate or otherwise, there will be a flow of short term funds into the country and the exchange rate of the currency will rise. Reverse will happen in case of fall in interest rates.

Bright investment climate and political stability may encourage portfolio investments in the country. This leads to higher demand for the currency and upward trend in its rate. Poor economic outlook may mean repatriation of the investments leading to decreased demand and lower exchange value for the currency of the country.

Movement of capital is also caused by external borrowing and assistance. Large scale external borrowing will increase the supply of foreign exchange in the market. This will have a favorable effect on the exchange rate of the currency of the country. When repatriation of principal and interest starts the rate may be adversely affected.

7. Political factors:

Political stability induced confidence in the investors and encourages capital inflow into the country. This has the effect of strengthening the currency of the country. On the other hand, where the political situation in the country is unstable, it makes the investors withdraw their investments. The outflow of capital from the country would weaken the currency. Any news about change in the government or political leadership or about the policies of the government would also have the effect of temporarily throwing out of gear the smooth functioning of exchange rate mechanism.

8.6   SPOT QUOTATIONS

Spot foreign exchange quotations can be given in variety of ways i.e, direct/indirect American/European, base/variable quotations. Understanding difference in foreign exchange quotations is the fundamental to understanding forex market. Also, it is to be noted that a forex quotation will always have one-pair of currency. Forex quotations are slightly different in interbank market and retail market.

Most of the interbank quotations are in European terms except four currencies. For Australian Dollar, New Zealand Dollar, Euro and Pound Sterling, interbank transactions are in the form of American Terms. Most banks quote price of USD per one unit Pound Sterling or USD per unit of Euro/ AUD.

Foreign exchange quotations can also be in "direct" or "indirect". A direct quote is the home currency price of one unit of foreign currency. An indirect quote is foreign currency price of one unit of domestic currency. A forex quotation becomes direct/ indirect quotations depending on who is using this quote. For example, INR 48.45/USD is a direct quotation for resident Indian while it is indirect quotation for American. Similarly, USD0.020673/ INR is a direct quotation for American person while it is an indirect quotation for Indian. INR 70.25/Pound is direct quotation for a resident Indian while Pound 0.01423/INR is an indirect quotation.

Normally, Banks and foreign exchange dealers use direct quotations while dealing with retail customers. Most of the times when we enter into a shop/hotel accepting foreign currency give the quotations in "direct terms". So also in case of banks – prominently display the home currency price of foreign currency.

Each forex quotation has a "base" currency and a "variable/quote/term" currency. Any exchange rate quotation shows how many units of variable/quote/term currency for unit of base currency. For example a forex exchange dealer is quoting USD/HKD as 7.7756. In his case, USD is the base currency while HKD 7.7756 variable/quote/term currency. Almost all forex quotations have the base currency as the first currency to be listed and are always equal to one. The second currency is the variable/quote/term currency. For example, the quote USD/HKD of 7.7756 means one USD costs 7.7756 HKD. In this USD is the base currency and HKD is the variable/quote/term currency. The forex trader always purchases and sells a fixed amount of the 'base' currency and exchange the amount of the variable/quote/term currency.

8.7 FORWARD TRANSACTIONS

In a forward contract both parties enter into a contract on a given day and lock in a fixed rate on specific future date. In such types of contract, the terms of the purchase (buy or sell) are agreed up front (trade execution date) but actual exchange take place on a date in the future (maturity date). On the maturity date, both parties exchange the pre-negotiated rate. For example, an Indian company which is likely to earn foreign currency i.e., Euro on account of an export order after one month, may enter into a contract today (trade execution date) to sell Euro and receive Indian Rupees after 1 month (maturity date). The rate is fixed on the trade date and the rate is known as Fwd- 1 month rate.

Suppose on trade date, the Indian exporter agrees to sell EURO 1000 and receive INR 72450. On the maturity date, he delivers EURO 1000 and receives INR 72450. Such types of forward contracts are known as outright forward contracts (OFTs).

The OFT exchange rate are quoted as differentials that is at a premium or discount from the spot rate. For example, if the base currency earns a lower interest rate than the term currency, then the base currency will trade at a forward premium or above the spot rate.

Illustrations:

1.   The following quote are available in Amstar Dam EUR / USD = 0.8875/85

                        1month =15 / 21

$$2 \text{ month} = 18 / 28$$

$$3 \text{ month} = 23 / 33$$

a) Calculate out right forward rate.

b) Calculate the percentage of annual derivation from the spot rate in case of 2months forward.

c) What is USD / EUR quotation for 3 months forward.

d) Support an investor wishes to buy 3 months forward 100,000 dollars. How much Euro we should pay.

e) Suppose an investor wishes to buy 1 month forward 50000 Euros. How much dollar he should pay. Assume exchange margin 0.0151%

Solution:

a) Calculation of outright forward rate

EUR / USD	0.8875 / 0.8885
Add: premium 1 month =	0.0015 / 0.00021
	0.8893 / 0.8913

EUR / USD	0.8875 / 0.8885
(+) premium 2 month =	0.0018 / 0.0028
	0.8893 / 0.8913

EUR / USD	0.8875 / 0.8885
(+) premium 2 month =	0.0023 / 0.0033
	0.8898 / 0.8918

b) Calculation of Annualised percentage

$$\left(\frac{\text{Forward – spot rate Rate}}{\text{Sport rate}} \right) \times \left(\frac{12}{\text{forward contract length in month}} \right) \times 100$$

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Note:- Spot rate Average rate $= \dfrac{0.8875+0.8885}{2}$

$= 888$

Forward rate (2months) $= \dfrac{0.8893 + 0.8913}{2}$

$= 0.8903$

$\dfrac{0.8903 - 0.8880}{0.8880} \quad X \quad \dfrac{12}{2} \quad X\ 100$

0.0025 X6X100

$= 1.5\%$

Therefore annualised percentage premium is 1.5

c)   Inverse quotation (3 Months)

EUR / USD = 0.8898 /0.8918

EUR / USD = ?

EUR / USD = $\dfrac{1}{0.8918} \bigg/ \dfrac{1}{8898}$

EUR /USD =   1.1213 / 1.1238

d)   Calculation of Euro for 100.000 dollar

EUR / USD = 0.8898/0.8918

Therefore Inter bank selling rate of USD = 0.8918

(+) Exchange margin (0.015X0808)   0.0001

0.8919

Rounded off   0.8925

100.000X0.8925 = 89250 Euro

Note:- rounded off=	00025
	0.0050
	0.0075

e)   EUR /USD = 0.8898 /0.8916   USD / EUR=?

USD / EUR = $\dfrac{1}{0.8906}$ $/$ $\dfrac{1}{0.8890}$

USD / EUR =   1.1228 / 1.1248

Inter bank selling Rate of EURO	= 1.1248
(+) Exchange margin (1.1248X0.015)	= 0.0002
USD	= 1.1250

Therefore 50.000 X 1.1250 = 56250 USD

8.8   FUTURE CONTRACTS

An exchange traded forward contract is known as futures contract. Forward contracts are tailor made depending on the requirement of the contract buyers or sellers. However being exchange traded futures contracts are standardized – contract size, maturity period etc. Being exchange traded futures contract can be squared off easily which may not be possible in case of forward contract. In case of futures contract, the clearing house associated with exchange takes the counterparty risk – risk that the loss making party does not deliver during the maturity period. Traders also have to pay margins – initial and daily margin as exchanges require all traders to pay margin. In India, forex futures contracts on INR/US$, INR/Euro, INR/Pound Sterling and INR/Japanese Yen are

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traded at some Indian exchanges like National Stock Exchange and United Stock Exchange.

8.9 CASE STUDY

Case Study 1

1. The U.S customer wishes to buy $ 100000 exchange margin 0.015%. The Euros required at the end of 2months. The quotation in New York as or follows.

Spot EUR / USD = 0.8875 / 85

1 Month = 18/12

2Month = 25/15

3Month = 30/20

How much euro he has to pay to the bank to get 100.000 dollar.

Case Study 2

2. The following rates are obtained in new York USD / CHF = 1.5880/90

Forward:-

1 month = 10/5

2 month = 20/10

3 month = 30/15

Calculate out right forward price?

8.10 NOTES

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8.11 SUMMARY

A spot contract is a contract that involves the purchase or sale of a commodity, security or currency for immediate delivery and payment on the spot date, which is normally two business days after the trade date. a forward contract is a contract that involves an agreement of contract terms on the current date with the delivery and payment at a specified future date. Contrary to a spot rate, a forward rate is used to quote a financial transaction that takes place on a future date and is the settlement price of a forward contract.

8.12 KEY WORDS

Spot

Forward

Arbitrage

Inflation

Interest Rates

Quotation

Cantract

Cantract

8.13 SELF ASSESSMENT QUESTIONS

1. Explain the determination of exchange rates in spot and forward market?

2. Illustrate with an example the spot rate?

3. Give the benefits of foreign exchange transactions?

4. How Government influence exchange rates?

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MODULE-III
FOREIGN EXCHANGE EXPOSURE

UNIT-9: TYPES OF TRANSACTION EXPOSURE

Structure :

9.0 OBJECTIVES

After studying this unit, you should be able to;

- define the term foreign exchange exposure.

- describe the types of foreign exchange exposure.

- determine the steps for measuring translation exposure.

- discuss on the issue of managing economic exposure.

9.1 INTRODUCTION

The general concept of foreign exchange refers to the degree to which a company is affected by the changes in the exchange rates. In other words, foreign exchange exposure refers to the change in the exchange rate due to change in the value of the assets, liability and operating income either through their direct relationship or rough common underlying factors. Foreign exchange exposure is the risk associated with activities that involve a global firm in currencies other than its home currency. Tackling these exposures is the biggest challenge that companies face today. It requires a broad based proactive risk management approach at the strategic level. Unmanaged foreign exchange exposure can cause significant fluctuations in the earnings and the market value of the firm. A very large exchange rate movement may cause special problems for a particular company, perhaps because it brings a competitive threat from a different country. At some level, the currency change may threaten the firm's viability, bringing the costs of bankruptcy to bear. It is more advisable to bear certain costs rather than giving chance to uncertainties to cause disproportionately high costs to the firm. Foreign exchange exposure not only affects firm's financial position but also its competitive position in the market and value of firm, if ignored it can paralyze the financial position of the company.

The magnitude of foreign exchange exposure has increased at a mind boggling rate in the recent times. Foreign exchange exposure is what is at risk of exchange rate variations. It is a measure of sensitivity of firm's cash flows of changes in exchange rate. This exchange rate risk may be transaction exposure, translation exposure or economic exposure. Transaction exposure is adverse movements of the exchange rate from the time foreign currency denominated transactions are initiated till the time of their final settlement. The exposure arises due to conversion of transactions from one currency into another currency. While buying or selling products in any foreign currency,

there is always a time gap between the dates of entering into a contract and its final settlement. During this time gap, the business firm is exposed to exchange rate fluctuations. These fluctuations may be favorable as well as unfavorable. The unfavorable fluctuations may turn a profitable deal unprofitable by the time of actual settlement of contracts; the longer the gap between the signing of a contract and its completion, the higher the level of exchange rate risks. Businesses that source their products from foreign countries also face the exchange rate risk.

Measurement of foreign exchange exposure and risk is an essential first step in international financial management. Without knowing how large a company's exposure and risk are, it is difficult to know how much effort and cost it is worth incurring to manage them. For example, if exposure represents a tiny fraction of the firm's value, it might be decided to ignore the matter, or at least leave exposure management to the company's shareholders who can decide for themselves whether the exposure on a particular company is diversifiable or otherwise avoidable. Other more, a company may find that it is exposed, but not at risk. This is possible in a rigidly fixed exchange rate environment such as Hong Kong or the People's Republic of China through the 1990s and beyond only by measuring exposure and risk can a company knowhow to allocate scarce corporate resources to the management of different sources of uncertainty .Perhaps hedging of key inputs or prices of outputs is more important for earnings stability than hedging foreign exchange-related matters.

9.2   MEANING AND DEFINITIONS

The term foreign exchange exposure is a measure of the potential for firm's profitability, net cash flow and market value to change because of a change in exchange rates. Foreign exchange (forex) risk and exposure have been central issues of international financial management for many years, considerable confusion remains about what exactly they are and how to measure them. For example, it is not uncommon to hear the term ''foreign exchange exposure'' used interchangeably with the term ''foreign exchange risk'' when in fact exposure and risk are conceptually and even dimensionally completely different (as we shall explain, foreign exchange risk is related to the variability of domestic-currency values of assets or liabilities due to unanticipated changes in exchange rates, whereas foreign exchange exposure is the amount that is at risk). This chapter is devoted to clarifying the nature of, and methods of measurement of, risk and exposure, as well as to explaining the factors contributing to them.

Mchael Adler and Bernard Dumas have defined foreign exchange exposure as "The measure of the sensitivity of changes in the real domestic currency value of assets, liabilities or operating incomes due to unanticipated changes in exchange rates".

While **Adler and Dumas's** definition makes it clear that unpredictability is paramount in the measurement of exchange rate risk, this author prefers a different focus on variability. The definition of exchange rate risk we shall use is as follows: Foreign exchange risk is measured by the standard deviation of domestic-currency values of assets or liabilities attributable to unanticipated changes in exchange rates.

9.3 NATURE OF FOREIGN EXCHANGE EXPOSURE

The nature of foreign exchange exposure is explained below:

1. Exposure is a measure of the sensitivity of domestic currency values of foreign currency denominated assets or liabilities;

2. Exposure concerns the real change in the value of the assets, liabilities or operating income.

3. The exposure exist on domestic as well as foreign assets;

4. The items on balance-sheet and income statement are exposed due to unanticipated change in exchange rate.

9.4 TYPES OF EXPOSURES

The following diagram shows the three major types of exposures or risk:
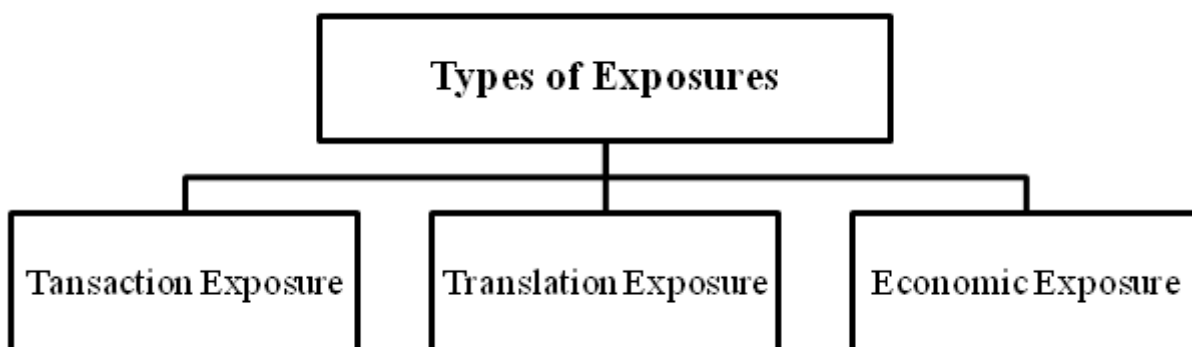
9.5 TRANSACTION EXPOSURE

Transaction Exposure is the risk of gains or losses that occurs when a firm engages in commercial transactions in which the currency of the transaction is foreign to the firm; i.e., it is denominated in a foreign currency. This is the type of exchange rate risk that we have looked at the various ways of managing via futures, forward contracts, options and money market hedges. Transaction exposure occurs when a value of a future transaction, through known with certainty, is denominated in some currency other than the domestic currency. In such cases, the monetary value is fixed in terms of foreign currency at the time of agreement which is completed at a later dates are exposed receipts are smaller than exposed payments.

For example, an Indian exporter is to receive payment in Euros in 90 days time for an export made today. His receipt in Euros is fixed and certain but as far as the Rupee value is concerned, it is uncertain and will depend upon the exchange rate prevailing at the time of receipt. All fixed money value transactions such as receivables, payables, fixed price sale and purchase contracts etc. are subject to transaction exposure. The transaction exposure looks at the effects of fluctuations in exchange rates on the transactions that have already been entered into and have been denominated in foreign currency.

Transaction exposure refers to the potential change in the value of a foreign currency denominated transaction due to changes in the exchange rate. Credit purchases and sales as well as borrowing and lending denominated in foreign currencies, and uncovered forward contracts are some examples of transaction exposure

9.5.1 Management of Transaction Exposure

Management of exposure means reduction or elimination of exchange rate risk through hedging. The techniques for hedging transaction exposure are:

1.   **Forward Contracts**:

When a firm has an agreement to pay (receive) a fixed amount of foreign currency at some date in the future, in most currencies it can obtain a contract today that specifies a price at which it can buy (sell) the foreign currency at the specified date in the future. This essentially converts the uncertain future home currency value of this liability (asset) into a certain home currency value to be received on the specified date, independent of the change in the exchange rate over the remaining life of the contract.

2. Futures Contracts:

These are equivalent to forward contracts in function, although they differ in several important features. Futures contracts are exchange traded and therefore have standardized and limited contract sizes, maturity dates, initial collateral, and several other features. Given that futures contracts are available in only certain sizes, maturities and currencies, it is generally not possible to get an exactly offsetting position to totally eliminate the exposure. The futures contracts, unlike forward contracts, are traded on an exchange and have a liquidity in secondary market that make them easier to unwind or close out in case the contract timing does not match the exposure timing. In addition, the exchange requires position taker to post a bond (margins) based upon the value of their positions. This virtually eliminates the credit risk involved in trading in futures.

3. Money Market Hedge:

Money market hedge also known as a synthetic forward contract, this method utilizes the fact from covered interest parity, that the forward price must be exactly equal to the current spot exchange rate times the ratio of the two currencies' riskless returns. It can also be thought of as a form of financing for the foreign currency transaction. A firm that has an agreement to pay foreign currency at a specified date in the future can determine the present value of the foreign currency obligation at the foreign currency lending rate and convert the appropriate amount of home currency given the current spot exchange rate. This converts the obligation into a home currency payable and eliminates all exchange risk. Similarly a firm that has an agreement to receive foreign currency at a specified date in the future can determine the present value of the foreign currency receipt at the foreign currency borrowing rate and borrow this amount of foreign currency and convert it into home currency at the current spot exchange rate. Since as a pure hedging need, this transaction replicates a forward, except with an additional transaction, it will usually be dominated by a forward (or futures) for such purposes; however, if the firm needs to hedge and also needs some short term debt financing, wants to pay off some previously higher rate borrowing early, or has the home currency cash sitting around, this route may be more attractive that a forward contract.

4. Options currency hedge:

Options are contracts that have an upfront fee, and give the owner the right, but not the obligation to trade domestic currency for foreign currency (or vice versa) in a specified quantity at a specified price over a specified time period. There are many different variations on options: puts and calls, European style, American style, and future-

style etc. The key difference between an option and the three hedging techniques above is that an option has a nonlinear payoff profile. They allow the removal of downside risk without cutting off the benefit form upside risk. There are different kinds of options depending on the exercise time the determination of the payoff price or the possibility of a payoff. While many different varieties exist, there are a few that corporations have found useful for the purposes of hedging transaction exposures.

9.5.2 Operational Techniques for Transaction Exposure

Transaction exposures can also be managed by adopting operational strategies that have the virtue of offsetting existing foreign currency exposure. These techniques are especially important when well functioning forward and derivative market do not exist for the contracted foreign currencies. These strategies include:

♦ **Risk Shifting-** The most obvious way to reduce the exposure is to not have an exposure. By invoicing all transactions in the home currency a firm can avoid transaction exposure all together. However, this technique cannot work for every one since someone must bear transaction exposure for a foreign currency transaction. Generally the firm that will bear the risk is the one that can do so at the lowest cost. Of course, the decision on who bears the currency risk may also impact the final price at which the contract is set.

♦ **Currency risk sharing** - An alternative to trying to avoid the currency risk is to have the two parties to the transaction share the risk. Since short terms transaction exposure is roughly a zero sum game, one party's loss is the other party's gain. Thus, the contract may be written in such a way that any change in the exchange rate from an agreed upon rate for the date for the transaction will be split between the two parties. For example a U.S. firm A contracts to pay a foreign firm B FC100 in 6 months based upon an agreed on spot rate for six months from now of

♦ **Leading and Lagging** - Another operating strategy to reduce transaction gains and losses involves playing with the timing of foreign currency cash flows. When the foreign currency in which an existing nominal contract is denominated is appreciating, you would like to pay off the liabilities early and take the receivables later. The former is known as leading and the latter is known as lagging. Of course when the foreign currency in which a nominal contract is denominated is depreciating, you would like to take the receivables early and pay off the liabilities later.

♦ **Reinvoicing Centers**: A re-invoicing center is a separate corporate subsidiary that manages in one location all transaction exposure from intra company trade. The manufacturing affiliate sells the goods to the foreign distribution affiliates only by selling to the re invoicing center. The re invoicing center then sells the good to the foreign distribution affiliate. The importance of the re invoicing center is that the transactions with each affiliate are carried out in the affiliates local currency, and there invoicing center absorbs all the transaction exposure.

Illustrations:

1. Assume that XYZ Corporation will need £ 200000 in 180 days. It considers using

a) Forward Hedge;

b) Money Market Hedge;

c) Option Hedge; and

d) No Hedge.

Its analyst develop the following information which can be used to assess the alternative solutions.

Spot Rate of £ as up to day $ 1.50

180 day forward rate of £ as up to day = $1.47

Interest rates are as follows:

Particulars	U.K	U.S
180 day deposit rate	4.5%	4.5%
180 day borrowing rate	5.0%	5.0%

♦ A Call option on £ that expires in 180 days has an exercise price of $ 1.48 and a premium of $ 0.03

♦ A put option on £ that expires in 180 days as an exercise price of $ 1.49 and a premium of $ 0.02

XYZ Corporation forecasted he futures sport rate in 180 days are as follows:

Possible outcome	Probability
$ 1.43	20%
$ 1.46	70%
$ 1.52	10%

Solution:

1) Forward Hedge:

Purchase £180 days forward

Dollars needed in 180 days = Payables in £ x Forward Rate of £

$$= £ 2,00,000 \text{ x } £ 1.47$$

$$= \underline{\$ 2,94,000}$$

2) Money Market Hedge:

Borrow $ convert into £ invest £ repays $ in 180 days

Amt in £ to be invested = $\dfrac{£ \, 200000}{(1+0.045)}$

$$= \underline{£ 1,91,388}$$

Amt is $ needed to convert into £ for deposit

1£ = $ 1.50

191388 £=?   £ 191388 x 1.50 = **$ 2,87082**

Interest and principle owed on $ loan after 180 days

= $2,87.082 x (1 + 0.05)

= **$ 3,01,436**

3) Currency Option Hedge:

In the option hedging purchase call option at a strike price of $ 1.48 and a premium of 0.03.

Possible Spot rate in 180 days	Strike Price	Premium	Exercise options ?	Total price paid per unit	Total price paid for £ 200000	Probability
$ 1.43	1.48	$0.03	No	$1.43+0.03=1.46$	$ 2,92,000	20%
$ 1.46	1.48	$0.03	No	$1.46+0.03=1.49$	$ 2,98,000	70%
$ 1.52	1.48	$0.03	Yes	$1.48+0.03=$1.51	$ 3,02,000	10%

4 . No Hedge:

Possible spot Rate in 180 days	$ need to Purchase £ 200000	Probability
$ 1.43	$ 2,86,000	20%
$ 1.46	$ 2,92,000	70%
$ 1.52	$ 3,04,000	10%

2. ABC Corporation anticipates no payable in £ but it will receive £ 3,00,000 in 180 days, the same information on the spot, forward and option prices is used to compare hedging techniques and they unhedge strategy of the previous.

Solution:

1. Forward Hedge:

Sell £180 days forward

Dollars to be received in 180 days = Receivables in £ x Forward Rate of £

= £ 3,00,000 x £ 1.47

= $ 4,41,000

2) Money Market Hedge:

Borrow £ convert into $ invest $ Use the receivable to payoff the borrowed amount

Amt in £ to be borrowed = $\frac{£\ 300000}{(1+0.05)}$

= £ 2,85,714

Amt is $ received from converting £

1£ = $ 1.50

2,85,714 £=?   £ 2,85,714 x 1.50 = **$ 4,28,571**

$ accumulated after 180 days (Invested amount + Interest)

= $ 4,28,571 x (1 + 0.45)

= **$ 4,47,857**

3) Option Hedge:

In the option hedging purchase put option with strike price of $ 1.49 and a premium of 0.02

Possible Outcome	Strike Price	Premium	Exercise options?	Total price paid per unit	Total price paid for £ 200000	Probability
$ 1.43	1.49	$0.02	Yes	$1.49 - 0.02=1.47$	$ 4,41,000	20%
$ 1.46	1.49	$0.02	Yes	$1.49 - 0.02=1.47$	$ 4,41,000	70%
$ 1.52	1.49	$0.02	No	$1.52 - 0.02=1.50$	$ 4,50,000	10%

4 . No Hedge:

Possible Outcome	$ received from converting £ 300000	Probability
$ 1.43	$ 4,29,000	20%
$ 1.46	$ 4,38,000	70%
$ 1.52	$ 4,56,000	10%

3. 'A' Ltd. as bought Swiss Autoparts 2 months ago, 'A' Ltd., will need Swiss French Franc 1,00,000 in 180 days. The company wants to hedge the currency risk. 'A' Ltd. Considers

a. Forward Hedge;

b. Money Market Hedge;

c. Option Hedge; and

d. No hedge.

Its analyst has developed the following information which can be used to assess the alternative solution. Spot rate $ 0.68 / SFr; 180 days forward rate $ 0.70 / SFr. Interest rates are as follows: Deposit rate; Switzerland 9% , US 13%, borrowing rates Switzerland 10%, US 14%. A Call Option on SFr that expires in 180 days has an exercise price $ 0.70 / SFr and a Premium of $ 0.02.

The future spot rate in 180 days were forecasted as follows:

Possible Outcome	Probability
$ 0.67	0.30
$ 0.70	0.50
$ 0.75	0.20

Advice the Company.

Solution:

Forward Hedge:

Purchase SFr 180 days forward

Dollars needed in 180 days = Payables in SFr x Forward Rate of SFr

= SFr 1,00,000 x SFr 0.70

= $ 70,000

2) Money Market Hedge:

Borrow $ convert into SFr invest SFr repays $ in 180 days

Amt in SFr to be invested = $\dfrac{£\ 100000}{(1+0.09)}$

= SFr 91,743

Amt is $ needed to convert into SFr for deposit

1SFr = $ 0.68

191388 SFr=?   SFr 91,743 x 0.68 = $ 62,385

Interest and principle owed on $ loan after 180 days

= $ 62,385 x (1 + 0.14)

= $ 71,119

3) Currency Option Hedge:

In the option hedging purchase call option at a strike price of $ 0.70/SFr and a premium of $ 0.02

Possible Spot rate in 180 days	Strike Price	Premium	Exercise options ?	Total price paid per unit	Total price paid for SFr 100000	Probability
$ 0.67	0.70	$0.02	No	$ 0.67+0.02=0.69	$ 69,000	0.30
$ 0.70	0.70	$0.02	No	$ 0.70+0.02=0.72	$ 72,000	0.50
$ 0.75	0.70	$0.02	Yes	$ 0.70+0.02=0.72	$ 72,000	0.20

4 . No Hedge:

Possible spot Rate in 180 days	$ need to Purchase SFr 100000	Probability
$ 0.67	$ 67,000	0.30
$ 0.70	$ 70,000	0.50
$ 0.75	$ 75,000	0.20

Interpretation:

As per this transaction exposure, the 'A' Ltd., has to go for forward hedge because it can purchase the SFr 1,00,000 with a $ 70,000 which is relatively less compared to other hedging technique. The company should not go with no hedge strategy because the company is not considering foreign exchange risk. In order to reduce the foreign exchange risks the company should go with forward hedge.

9.6 TRANSLATION EXPOSURE

Translation exposure is also referred to as accounting exposure or balance sheet exposure. The restatement of foreign currency financial statements in terms of a reporting currency is termed translation. The exposure arises from the periodic need to report consolidated worldwide operations of a group in one reporting currency and to give some indication of the financial position of that group at those times in that currency. Translation exposure is measured at the time of translating foreign financial statements

for reporting purposes and indicates or exposes the possibility that the foreign currency denominated financial statement elements can change and give rise to further translation gains or losses, depending on the movement that takes place in the currencies concerned after the reporting date. Such translation gains and losses may well reverse in future accounting periods but do not, in themselves, represent realized cash flows unless, and until, the assets and liabilities are settled or liquidated in whole or in part.

In any event, translation exposure is not a real gain or loss in terms of making or losing money. The gain or loss results simply from translating from one currency to another. In that sense, one should not really worry about translation exposure (except to the extent that there is a perceived gain or loss from unsophisticated users of the financial statements). This is also referred to as conversion exposure or cash flow exposure. It concerns the actual cash flows involved in setting transactions denominated in a foreign currency**.**

These could include, for example:

♦ Sales receipts

♦ Payments for goods and services

♦ Receipt and/or payment of dividends

♦ Servicing loan arrangements as regards interest and capital

The existence of an exposure alerts one to the fact that any change in currency rates, between the time the transaction is initiated and the time it is settled, will most likely alter the originally perceived financial result of the transaction. It is, for example, important to commence monitoring the exposure from the time a foreign currency commitment becomes a possibility, not merely when an order is initiated or when delivery takes place. The financial or conversion gain or loss is the difference between the actual cash flow in the domestic currency and the cash flow as calculated at the time the transaction was initiated, i.e., the date when the transaction clearly transferred the risks and rewards of ownership. Where financing of a transaction takes place, such as a loan obligation, there are also gains/losses which may result.

9.6.1 Measurement of Translation Exposure

Translation exposure measures the effect of an exchange rate change on published financial statements of a firm. Assets & liabilities that are translated at the current exchange rate are considered to be exposed (uncovered) as the balance sheet will be affected by fluctuations in currency values over time. Assets & liabilities that are

translated at a historical exchange rate will be regarded as not exposed as they will not be affected by exchange rate fluctuations. So, the difference between exposed asset & exposed liabilities is called translation exposure.
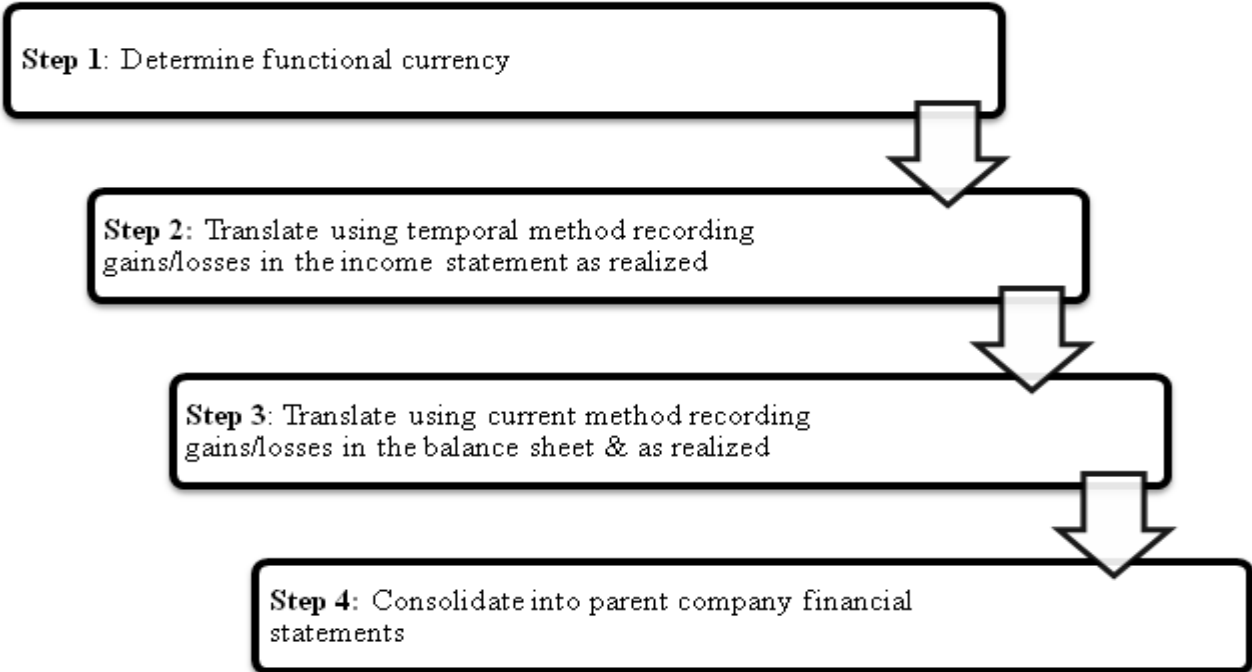
Formula:

Translation Exposure = Exposed Assets - Exposed Liabilities (Change in the Exchange Rate)

Under the generally accepted US accounting principles, the net monetary asset position of a subsidiary is used to measure its parent's foreign exchange exposure. The net monetary asset position is monetary assets such as cash & accounts receivable minus monetary liabilities such as accounts payable & long-term debt. The translation of gains & losses does not involve actual cash flows – these gains or losses are purely on paper i.e. they are of an accounting nature.

9.6.2 Steps for Measurseing Translation Exposure

The following diagram shows that steps for measuring translation exposure as follows:

Step 1: Determine functional currency

Step 2: Translate using temporal method recording gains/losses in the income statement as realized

Step 3: Translate using current method recording gains/losses in the balance sheet & as realized

Step 4: Consolidate into parent company financial statements

9.6.3 Methods of Translation

The different methods of translation vary among themselves as they are not unanimous on the items of the financial statement, which are exposed to changes in the exchange rate.

1. Current Rate Method

2. Current / Non-Current Method

3. Monetary / Non-Monetary Method

4. Temporal Method

1. **Current Rate Method:** The Current Rate Method is also known as the closing rate method. In this method, all items of the income statement and the balance sheet are translated at current rate or the post change rate. This method is preferred in case of those subsidiary located countries where the local currency accounts are periodically adjusted for inflation. The translation exposure in this case is simply the net worth of the affiliate as stated in local currency.

2. **Current / Non Current Method:** In this method current assets and current liability of the subsidiary are translated at current rte or the post-change rate. The fixed assets and long-term liabilities are translated at the historical or pre-change rate or at a rate at which they were acquired.

3. **Monetary / Non-Monetary Method**: In this method the assets and liabilities are classified as monetary and non-monetary. The income statement items are translated at average rate and those closely related to non-monetary assets and liabilities are translated at historical rate.

4. **Temporal Method**: the temporal method to a great extent resembles the monetary / non-monetary method. The main difference is that under the temporal method, inventory is translated at current rate if it is shown at market value. In the monetary / non-monetary method, it is translated at historical rate in all probabilities.

Illustrations:

Faran Products is the Canadian affiliate of a US manufacturing company. Its balance sheet in thousands of Canadian Dollars for Jan 1, 2015 as shown below . The Jan 1, 2015 Exchange rate was C $ 1.61$.

Faran Products balance sheet (Thousand of C$)

Assets	Amt	Liabilities and Net Worth	Amt
Cash	C$ 1,00,000	Current liabilities	C$ 60,000
Accounts Receivable	2,20,000	Long Term debt	1,60,000
Inventory	3,20,000	Capital Stock	6,20,000
Net Plant and Equipment	2,00,000		
Total	**C$ 8,40,000**		**C$ 8,40,000**

a) Determine Faren Products accounting exposure on Jan 1, 2016 using the current rate method /monetary /non –monetary method.

b) Calculate Faren products contribution to its parents accounting loss if the exchange rate on Dec 31, 2015 was C$ 1.8 / $. Assume all accounts remain as they were at the beginning of the year

Solution: Given

US – Parent Company

Canada- Subsidiary Company

H = C$ 1.61/ $$

C = C$ 1.81 / $

a. Current Rate Method

Particulars	Amt in C$	Exchange Rate	Conversion to US $
Assets			
Cash	1,00,000	C$ 1.8	$55555.55
Accounts receivable	2,20,000	C$ 1.8	122222.22
Inventory	3,20,000	C$ 1.8	177777.77
Net plant & equipment	2,00,000	C$ 1.8	111111.11
Total	8,40,000		466666.65
Liabilities			
Current liabilities	60000	C$1.8	33333.33
Long term debt	1.60.000	1.8	88888.88
Capital Stock	6.20.000	1.6	387500.00
CTA			(43,055.56)
	8.40.000	-	4,66,666.65

b. Monetary / Non-Monetary Method

Particulars	Amt in C$	Exchange Rate	Conversion to US $
Assets			
Cash	1,00,000	C$ 1.8	$55555.55
Accounts receivable	2,20,000	C$ 1.8	122222.22
Inventory	3,20,000	C$ 1.6	200000.00
Net plant & equipment	2,00,000	C$ 1.6	125000.00
Total	8,40,000	-	$502777.77
Liabilities			
Current liabilities	60000	C$1.8	33333.33
Long term debt	1.60.000	1.8	88888.88
Capital Stock	6.20.000	1.6	387500.00
CTA			(6944.44)
	8.40.000	-	5,02,777.77

2. AV Ltd., is the Indian affiliate of a US Sports manufacturer. AV Ltd. manufactures items which are sold primarily in the US & Europe. Av's balance sheet in thousands of rupees as of march 31st is as follows:

Assets	Amt in (₹)	Liabilities & Networth	Amt in (₹)
Cash	6000	Accounts payable	3.500
Accounts receivable	4500	Short term bank loan	1,500
Inventory	4500	Long term loan	4000
Net Plant & Equipment	102000	Capital stock	10.000
		Retained earnings	6000
Total	**25000**		**25000**

Exchange rates for translating the balance sheet into US$ are 35/$ Historic exchange rate, at which plant & equipment, long term loan & common stock were acquired or issued 40/$; 31st / 3 exchange rate. This was also the rate at which inventory was acquired 42/$ 1st /4 exchange rate, after devaluation of 20%.

Assuming no change in balance sheet accounts between 31st /3 & 1st/4, Calculate Accounting Gain or Loss by the Current rate method & by Monetary/Non-monetary method. Explain accounting loss in terms of changes in the value of exposed accounts.

Solutions:

U.S -> Parent Co.,

India -> Subsidiary Co

H = 35//$

C = on 31/3 is 40/$

C = on ¼ is 42/$

a.   Current rate method

Particulars	₹	Exchange rate on 31/3	Conversion to US $	Exchange Rate on 1/4	Conversion to US$
Assets					
Cash	6000	40	150	42	142.85
A/c receivable	4500	40	112.5	42	107.14
Inventory	4500	40	112.5	42	107.14
Net plant & equipment	10,000	40	250	42	238.09
	25000	-	625	-	595.22
Liabilities					
A/c payable	3500	40	87.5	42	83.33
Short term bank loan	1500	40	37.5	42	35.71
Long term loan	4000	40	100	42	95.23
Capital stock	10000	35	285.71	35	285.71
Retained earnings	6000	35	171.42	35	171.42
CTA			(57.13)		(76.18)
	25000		625		595.22

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b. Monetary & Non-monetary rate method

Particulars	₹	Exchange rate on 31/3	Conversion to US $	Exchange Rate on 1/4	Conversion to US $
Assets					
Cash	6000	40	150	42	142.85
A/c receivable	4500	40	112.5	42	107.14
Inventory	4500	35	128.57	35	128.57
Net pant & equ	10000	35	285.71	35	285.71
	25,000	-	676.78	-	664.27
Liabilities					
A/c payable	3500	40	87.5	42	83.33
Short term bank loan	1500	40	37.5	42	35.71
Long term loan	4000	40	100	42	95.23
Capital stock	10000	35	285.71	35	285.71
Retained earnings	6000	35	171.42	35	171.42

9.6.4 Management of Translation Exposure

There is a view that hedging of translation exposure is not necessary as it does not affect the cash flow but that firms try to hedge it in view of its potential impact on the reported consolidated earnings. There are two techniques in managing translation exposure.

a.   Balance-sheet Hedge:

Translation exposure emerges out of mismatch between the net assets and the net liabilities. Balance-sheet hedge attempts in eliminating such mismatches. The comparison of different translation methods illustrated above shows the extent of translation exposure arising on account of lower amount of liabilities than the assets and its impact on the net worth. If fresh borrowings are made to eliminate this mismatch, it would be called a balance-sheet hedge. However, it is to be considered that borrowing should be made in weaker currency. If, on the other hand, the situation is reverse meaning that the amount of asset is lower than that of liabilities, assets need to be matched with the liabilities through making investment. But the investment should be made in stronger

currency. It is because the whole mechanism of balance-sheet hedge rests on the belief that strong currencies normally tend to appreciate and weak currencies that are prone to depreciation. So, the exposure can be hedged if strong currency assts substitute by weak currency liabilities. For this purpose, weak currency assets are converted into hard-currency assets and hard-currency liabilities are converted into weak-currency liabilities.

b.   Contractual and Natural Hedge:

When borrowings / investments are made under the process of balance-sheet hedge, there is every possibility for the emergence of transaction exposure in face of changing exchange rate. Hedging a particular currency exposure means establishing an offsetting currency position such that whatever is lost or gained on the original currency exposure is exactly offset by a corresponding foreign exchange gain or loss on the currency hedge. If this can be achieved for each foreign currency, net accounting exposure will be zero. The hedging technique should be a standard technique responding to anticipated currency changes on the basis of costs and benefits. Based on the hedging strategy, the cost factor should analytically be evaluated.

9.7   ECONOMIC EXPOSURE

Economic exposure or operational exposure moves outside of the accounting context and has to do with the strategic evaluation of foreign transactions and relationships. It concerns the implications of any changes in future cash flows which may arise on particular transactions of an enterprise because of changes in exchange rates, or on its operating position within its chosen markets. Its determination requires an understanding of the structure of the markets in which an enterprise and its competitors obtain capital, labour, materials, services and customers. Identification of this exposure focuses attention on that component of an enterprise's value that is dependent on or vulnerable to future exchange rate movements. This has bearing on a corporation's commitment, competitiveness and viability in its involvement in both foreign and domestic markets. Thus, economic exposure refers to the possibility that the value of the enterprise, defined as the net present value of future after tax cash flows, will change when exchange rates change.

Economic exposure will almost certainly be many times more significant than either transaction or translation exposure for the long term well-being of the enterprise. By its very nature, it is subjective and variable, due in part to the need to estimate future cash flows in foreign currencies. The enterprise needs to plan its strategy, and to make operational decisions in the best way possible, to optimize its position in anticipation of changes in economic conditions.

The extent to which the value of the firm changes when the exchange rate changes (value is measured as the present value of expected future cash flows)

Suppose PV = present value of the firm

ÄPV = change in present value of the firm

ÄS = change in exchange rate

If ÄPV/ÄS '" 0,

Then the firm is exposed to currency risk (i.e., operating exposure) economic exposure arises because currency fluctuations can alter a firm's future revenues and costs.

9.8   MANAGING ECONOMIC EXPOSURE

Operational Strategies for Managing Economic Exposure

By its very definition, operating exposure is the impact of exchange rate changes on the firm's actual operations. Therefore, the first place to consider how to manage this exposure is to consider operation responses to exchange rate changes. Ideally the firm would like to set up its operations, production, sourcing, marketing such that the firm can respond to change in the real exchange rate so as to take advantage of the improved competitive positions and/or limit the harm caused by the degradation of competitiveness. Unlike financial hedging which provide the firm a deterministic cash flow in response to exchange rate movements without any real economic actions on the part of the firm, operational strategies require the firms to react to the new economic environments resulting from the exchange rate change and make changes to the economic behavior of the firm.

The following are the strategies adopted to manage Economic Exposure:

I.   Marketing Strategies;

II.   Production Strategies; and

III.   Financial Strategies;

9.8.1 Marketing Strategies for Managing Economic Exposure

1.   Market Selection:

A major strategic consideration for a firm is what market to sell in and the relative marketing support to devote to each market. For example, firms may decide to pull out of markets that have become unprofitable due to real exchange rate changes, and more

aggressively pursue market share or expand into new markets when the real exchange rate depreciates. These decisions depend, among other things, on the fixed costs associated with establishing or increasing market share. Market selection and market segmentation provide the basic parameters within which a company can adjust its marketing mix over time. They are primarily medium and longer term decisions and may not be feasible strategies to react to exchange rate exposure in the short run. For shorter run marketing reactions to exchange rate exposure, the firm may have to turn to pricing or promotional policies.

2.   Pricing Policies:

As we saw previously, in response to changes in real exchange rates, a firm has to make a decision regarding market share versus profit margin. This involves the pass through decision with respect to the foreign currency price of foreign sales. Of course, such a decision should be made by setting the price that maximizes dollar profits to the firm; however, since the world is stochastic, this is not always a clear choice. The decision on how to adjust the foreign currency price in response to exchange rate changes will depend upon how long the real exchange rate change is expected to persist, the extent of economies of scale that occur from maintaining large quantity of production, the cost structure of expanding output, the price elasticity of demand, and the likelihood of attracting competition if high unit profitability is apparent. The longer the exchange rate change is expected to persist, the greater the price elasticity of demand, the greater are the economies of scale and the greater is the possibility of attracting competition, the greater will be the incentive to lower home currency price and expand demand in light of a home currency depreciation, and to keep home currency price fixed and maintain demand in light of a home currency appreciation. However, in deciding to change prices, the firm should take into account the impact on cash flows not just today but in the future as well, as once a customer is lost, he may be lost for a long period of time making it difficult for a firm to regain market share.

3.   Promotional Strategies:

An essential issue in any marketing program is the size of the promotional budget for advertising, selling and merchandising. These budgets should explicitly build in exchange rate impacts.

9.8.2 Production Strategies for Managing Economic Exposure

All of these responses have involved attempts to alter the dollar value of foreign currency revenues. However, sometime real exchange rates change but such a large margin

that marketing strategies and pricing decisions cannot make the product profitable. Firms facing such circumstances must either drop the products or cut costs. Product mix, product sourcing and plant location are the principle production strategies that companies can use to manage competitive risks that cannot be handled by marketing strategies alone. The basic idea is to diversify the production mix such that the effect of exchange rate changes washes out or tie your costs more closely to your foreign competitors.

1.   Diversifying Operations:

One possibility to dealing with the impact of exchange rate exposure on the firm's cash flows is to have the firm diversify into activities with off-setting exposures to the exchange rate. For example, combine the production and exporting of a manufactured good with an importing operation that imports competitive consumer goods from foreign producers. This creates a natural operating hedge that keep total dollar cash flows steady in light of real exchange rate movements. While the benefits of this strategy are obvious, it has some potential drawbacks: it may lead the firm to enter into activities in which it has no apparent comparative advantage resulting in an inefficient source of resources, or alternatively, the firm may view the two activities as complementary and allow cross subsidization to occur for long periods of time and not consider the economic viability of each operation on its own. Put another way, unless done carefully, this can be an expensive way to hedge an operating exposure.

2.   Diversifying Sources of Inputs:

For firms wishing to stick to their knitting, the goal of a production strategy should be to reduce operating costs. The most flexible way to do this in light of a real home currency appreciation is to purchase more components from overseas. As long a the inputs are not priced in a globally integrated market (i.e., gold or oil), then the appreciation should lower the dollar cost of the inputs and thus total production costs. For the longer term, the firm may wish to consider the option of designing new local facilities that provide added flexibility in making substitutions among various sources of inputs, either from domestic sources or foreign sources. However, this strategy does not bode well for the concept of good supplier relations, and potential costs associated with constantly switching suppliers' needs to be taken into consideration when evaluating this strategy.

3.   Plant Location:

The most obvious way to be able to take advantage of relative costs changes due to real currency movements is to have production costs based in different currency by

actually having production capacity in different countries. The simplest response is to move production to your competitors market. Then any relative cost advantage he may gain from exchange rate changes also accrues to you as well. Alternatively, placing a plant in a third country based upon the intensity of certain inputs to production (i.e., labour, raw materials) may make more sense; however one needs to think about the correlations between the third country exchange rate and the foreign competitor's exchange rate to evaluate the hedge value of such an decision. The primary exposure management advantage to having foreign plant locations arises from the ability of the firm to shift production among the plants in response to real exchange rate change. Thus a firm with foreign plants can always produce at capacity in the location where costs are low, and meet additional demand from progressively higher costs locations. This is a generally a method for long run management of operating exposure, as plants take time to build. However, in response to a real exchange rate change that is expected to persist for some time, a firm may decide to undertake the development of foreign production through licensing or foreign acquisition.

4.   Plant Location as a Real Operating (Flexibility) Option:

Foreign plant locations are a good example for seeing the relation between real hedges and financial hedges. When neither the domestic or foreign plant are run at capacity, on average, the ability to transfer some production between the domestic and foreign plant is an option that the firm has. Just like a financial option, this real option hedges the firm's cash flows. Moreover, the firm can actually increase cash flows more than linearly with a beneficial change in the exchange rate, by increasing the quantity produced domestically (the low cost source) and reducing production abroad (the high costs source), and similarly reduce cash flows less than linearly with adverse exchange rate changes by increasing the quantity produced abroad (the low cost source) and reducing production domestically (the high costs source). Essentially the firm can alter the size of its exposure with the exchange rate. The existence of a foreign plant provides a real operating option that not only hedges the variability of firm cash flows, but depending on the costs of building and maintaining foreign plants, may actually add to total firm value Since this is an option, it value will increase with the variability of the real exchange rate. The implication of this is that foreign plants provides a real option that has value, and even in a world where there may be, on average, a cost disadvantage to producing abroad, the firm will can increase in value by installing production capacity abroad when real exchange rate will be volatile.

9.8.3 *Financial Strategies for Managing Economic Exposure*

The financial strategies for hedging operating exposure can roughly be broken down into two groups, the goals of these two groups are the same, it is just the relation to firm operations that differs. These are evaluating and managing the currency structure of a firm's debt, and the addition to the firm of external contracts whose market values or net payoffs are negatively related to the impact of real exchange rate change on firm value.

1. **Denomination of Firm Debt:**

The basic goal of hedging is to try to eliminate exposure. For real operating exposure to exchange rates, this can be done by trying to match (as best as possible) foreign currency inflows with foreign currency outflows. Since operating exposure is based upon long terms currency flows, and we have seen previously that future foreign currency revenues are affected by exchange rate changes, the firm may attempt to hedge some of this exposure by denominating some of their long term debt in foreign currency so as to generate offsetting impacts on expected cash flows.

2. **Swaps:**

Swaps are a financial instrument that allows the buyer to exchange one set of cash flows for another. Thus the buyer of a swap agrees to make periodic payments based upon some financial price and in return receives periodic payments based upon some other financial price. The most common swaps are interest rate swaps. In these, a firm agrees to pay the market (floating) rate over time (say every six month) on a given principal while at the same time receiving fixed interest rate payments on the same principal amount. Generally, the rates are set so that the PV of the expected payments equal the PV of the fixed receipts. Thus the swap is a zero NPV contract. Since the principal amount is purely notional (only for determining the size of the payments) no money is exchange up front or at the end.

3. **Options:**

Options are a popular way for the firm to protect the domestic currency value of future foreign currency cash flows. While exchange traded options only extend out for a year, over the counter option can be purchased, or sold, at maturities of up to 5 years (though spreads at these maturities are rather high). By creating a portfolio of long dated call options in foreign currency a firm can provide a financial offset to the impact of potential adverse currency movements on the stream of foreign currency cash flows. As with most hedges of operating exposure, it is virtually impossible to perfectly hedge as

the exact quantity of foreign currency cash flows at each point in the future is unknown, but the options are fixed quantity contracts.

9.9 DIFFERENCES BETWEEN TRANSACTION, TRANSLATION AND ECONOMIC EXPOSURE

The following are the major differences among the exposures:

S. No.	Bases	Transaction Exposure	Translation Exposure	Economic Exposure
.	Duration	Duration of the contract	At a point of time (conversion)	Life of the project
.	Gains/Losses	Actual, total value relatively less difficult to calculate	Paper exercise only easy to work out	Actual, total value difficult to compute
.	Contract	Specific in nature	Specific in nature	General in nature
.	Measurement	Value depends on changes in actual spot rates	Value depends on accounting guidelines	Value depends on variation in actual spot rates
.	Hedging	Relatively easy	Easy	Difficult (because difficult to predict)
.	Value	Contract value of assets and liabilities	Book value of assets and liabilities	Market value of assets
.	Extent of exposure	Determined by the nature	Depends on the accounting rules	Guided by the product and factor markets
.	Management of exposure	Treasury department	Treasury department	All departments

Thus, the translation exposure is historic in nature. It is basically static. It does not consider the change in an exchange rate. Moreover, no cash flow is involved in this exposure. The transaction and economic exposures, on the other hand, consider the impact of an exchange rate change in future. It may be noted that the firms are exposed to exchange rate changes at every stage in the process of capital budgeting, from developing new products to entering into contracts to sell these products in foreign market. For example, a weakening of the Re. will increase the competition among firms that depend upon the export markets, while hurting those firms that need import as inputs in their production process.

The transaction exposure can result in exchange rate related losses and gains that are already realized and have an impact on the reported income. However, the translation exposure results in exchange rate losses and gains that are reflected in the firm's accounting record and are not realized and hence have no impact on the taxable income. Thus, if the financial market are efficient and the managerial goal is consistent with the wealth maximization, then the firm should not have to waste efforts and real resources hedging against the book value losses caused by translation exposure. However, if the financial market is not efficient, then the firm should find it economical and go for hedge against expected translation exposure. But it is useful for a firm to manage its transaction and economic exposures because they affect the value of the firm directly by the firm.

9.10 CASE STUDY

CASE STUDY 1

The 6 month interest rate (annualized) in Italy and France are 13 percent and 11 percent, respectively. The current exchange rate is Lira 296.10/FF and the 6 month forward rate is Lira 326.50/FF.

(a) Where should a French investor invest?

(b) Where should be borrow from?

(c) Is there any arbitrage opportunity for the investor?

CASE STUDY 2

2. Manu Co is a U.S firm conducting a financial plan for the next year. It has no foreign subsidiary but more than half of sales are from exports. Its foreign cash inflows to be paid for in ported supplies over the next year are discussed below:

Currency	Total inflow	Total outflow
Canadian dollar (C$)	C$ 35,00,000	C$ 25,00,000
German Mark (DM)	DM 55,00,000	DN 16,00,000
French Franc (FF)	FFs 15,000,000	SF 80,00,000
Swiss Franc (SF)	SF 6,000,000	SF 80,00,000

The spot rates and 1 year forward rates as of today area

Currency	Spot Rate	1 year Forward rate
C$	$0.90	$0.95
DM	$0.62	$10.59
FF	$0.16	$0.14

9.11 NOTES

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9.12 SUMMARY

Foreign exchange risk is a financial risk that exists when a financial transaction is denominated in a currency other than that of the base currency of the company. Foreign exchange risk also exists when the foreign subsidiary of a firm maintains financial statements in a currency other than the reporting currency of the consolidated entity. The risk is that there may be an adverse movement in the exchange rate of the denomination currency in relation to the base currency before the date when the transaction is completed.

9.13 KEY WORDS

Exposure

Risk

Forward Contract

Futures

Options

Swaps

9.14 SELF ASSESSMENT QUESTIONS

1. What is foreign exchange exposure?

2. Explain the various techniques in management of transaction exposure?

3. Discuss the strategies adopted to manage economic exposure?

4. Differentiate between transaction, translation and economic exposures?

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UNIT-10:EXCHANGE RATES

Structure :

10.0 OBJECTIVES

After studying this unit, you should be able to;

- define the term foreign exchange rate.

- describe the various kinds of exchange rate system.

- discuss the determination of exchange rate.

- mention the problems of exchange rate.

10.1 INTRODUCTION

In the foreign exchange market, currencies of different nations are traded. In the course of exchanging one currency for another, an exchange rate is established. This exchange rate determines how much of one country's currency should be exchanged for that of another. This activity is of particular interest to the government of every nation and to the business community, especially those that deal with the international market. Based on this, business managers would be able to design better policies for their firms when they possess knowledge of the exchange rate. In this section of the work, we will be examining the concept of exchange rate and the types of exchange rates. Exchange rate (also known as foreign exchange rate, forex rate or FX rate) between any two currencies are the rates at which they are exchanged or sold against each other.

Currency of a country is used for transactions with foreigners. Each country in the world has its own currency. Theoretically, a country should transact with all foreign entities on a one-to-one basis, i.e. for all imports from a foreign country, a host country should pay in the currency of the former and for all exports, and the host country should be paid in its currency. But practically this is not possible because it involves keeping record of a multitude of exchange rates and associated payment problems. Therefore, most of the countries choose a common currency for trade amongst themselves. The U.S. dollar has emerged as the strongest international currency for the past sixty years and as such is used as the payment medium for most of the world trade. In the European Union the Euro has established itself as the common currency of about 25 countries.

It is clear that the currency of a country is evaluated against a common currency for external transactions. In case of countries having dominant economic power, trade would be held in their currency. Hence a country is required to trade in U.S. dollar or in other dominant currencies like Euro, Pound or the Japanese Yen. Account of a country's external trade is kept in the form of a Balance of payment account which is a double

book entry system. Receipts of foreign currencies are credited to this account while payments in foreign currency are debited to this account. The balance in this account shows a positive or a negative figure depending upon whether the receipts of foreign currency are more or less than the payments. Other things being equal, the presumption is that a country having a deficit balance of payments position would have a weakening national currency and vice versa. A deficit in the balance of payment account results in more demand for foreign currencies. Hence their value verses the domestic currency increases in domestic currency.

10.2 MEANING OF EXCHANGE RATE

Exchange rate (also known as foreign exchange rate, forex rate or FX rate) is a rate between any two currencies or the rates at which they are exchanged or sold against each other. In the foreign exchange market, currencies of different nations are traded. In the course of exchanging one currency for another, an exchange rate is established. This exchange rate determines how much of one country's currency should be exchanged for that of another. This activity is of particular interest to the government of every nation and to the business community, especially those that deal with the international market. Based on this, business managers would be able to design better policies for their firms when they possess knowledge of the exchange rate. In this section of the work, we will be examining the concept of exchange rate and the types of exchange rates.

10.3 KINDS OF EXCHANGE RATE SYSTEM

The choice between fixed, flexible and managed floating rates may then change as priorities change. The three kinds of exchange rate system are as follows:

a)   Fixed Exchange Rate System;

b)   Floating Exchange Rate System; and

c)   Managed Floating Rate System.

a)   Fixed Exchange Rate System:

The currency arrangement negotiated at Bretton Woods and monitored by the IMF worked fairly well during the post-World War II period of reconstruction and rapid growth in world trade. However, widely diverging national monetary and fiscal policies, differential rates of inflation and various unexpected external shocks eventually resulted in the system's demise. The U.S. dollar was the main reserve currency held by central banks and was the key to the web of exchange rate values. Unfortunately, the United

States ran persistent and growing deficits on its balance of payments. A heavy capital outflow of dollars was required to finance these deficits and to meet the growing demand for dollars from investors and businesses. Eventually, the heavy overhang of dollars held abroad resulted in a lack of confidence in the ability of the United States to meet its commitment to convert dollars to gold.

b)   Floating Rate System:

In a floating-rate system, it is the market forces that determine the exchange rate between two currencies. The advocates of the floating rate system put forth two major arguments. One is that the exchange rate varies automatically according to the changes in the macroeconomic variables. As a result, there is no gap between the real exchange rate and the nominal exchange rate. The country does not need any adjustment, which is often required in a fixed rate regime and so it does not have to bear the cost of adjustment. The other argument is that this system possesses insulation properties, that is the currency remains isolated from the shocks emanating from other counties. It also means that the government can adopt an independent economic policy without impinging upon the external sector performance.

c)   Managed Floating Rate system:

A managed flexible rate system is that in which nations now and then intervene to adjust their official reserve holdings and to moderate major changes in the exchange rate.international monetary system is best described as a managed flexible exchange rate system. Sometimes it is referred to more casually as a managed float. It is a kind of compromise between the fixed and flexible exchange rates. Nations now and then intervene to adjust their official reserve holdings to moderate major swings in exchange rates. Buying up or supplying foreign currency at the market price does this, It allows nations to pursue independent monetary policies. Under a (strict) fixed exchange rate system, fixed either by agreement or by gold, a nation with a merchandise trade deficit might have to enact a tight monetary policy in order to retard inflation and promote its export. This would not be the case with a managed float system.

10.4 DETERMINATION OF EXCHANGE RATES

Exchange rate in a floating rate system is determined by the demand and supply forces. The higher the demand or lower the supply, the greater the value of the currency in the spot foreign exchange market. There are different theories explaining the exchange rate behavior. While the balance of payments theory stresses on the current account and the capital account behavior influencing the exchange rate, the monetary theories emphasize on the demand and supply of money being the main force behind exchange rate behavior. Some forecasters believe that for the major floating currencies, foreign exchange markets are efficient and forward exchange rates are unbiased predictors of future spot exchange rates. The asset approach to forecasting suggests that whether foreigners are willing to hold claims in monetary form depends partly on relative real interest rates and partly on a country's outlook for economic growth and profitability. The factors influencing the exchange rate are primarily the inflation rate and interest rate differentials. In the forward market it is the Interest Rate Parity theory that explains exchange rate determination. There is no generally accepted theory or model to determine exchange rates. However, there are certain approaches which provide a general framework for analysis of exchange rates which are discussed below:

♦ **Balance of payments:** If payments by a country for its imports of goods and services and invisibles are out of step with its receipts for exports of goods and services and invisible, two possibilities arise. One, foreign currency payments exceed receipts and there is a deficit. This puts the home currency of the country under downward pressure against foreign currencies. Two, there is a surplus and there is an upward pressure on the home currency. In the former case, the home currency tends to depreciate, and in the latter to appreciate, against foreign currencies.

♦ **Demand and supply**: The demand for a foreign currency to pay for imports, etc. and the supply of a foreign currency by way of receipts on account of exports, etc. vary at various rates of exchange. The rate which equilibrates the demand and supply should be the rate of exchange.

♦ **Purchasing power parity:** This theory maintains that free international trade equalises prices of tradable goods in different countries. So, a product will sell for the same price in common currency in all countries. Different rates of changes in prices i.e. different inflation rates must eventually induce off-setting changes in exchange rates in order to restore approximate price equality.

♦ **Interest rate:** Interest rates are often highly related with inflation rates, and interest rate differentials between countries may be the result of inflation rate.

♦ **Prices and Exchange Rates:** If the identical product or service can be sold in two different markets, and no restrictions exist on the sale or transportation costs of moving the product between markets, the product's price should be the same in both markets. This is called the law of one price. A primary principle of competitive markets is that prices will equalize across markets if frictions or costs of moving the products or services between markets do not exist. If the two markets are in two different countries, the product's price may be stated in different currency terms, but the price of the product should still be the same. Comparison of prices would only require a conversion from one currency to the other.

♦ **Managed Floats:** Although still relying on market conditions for day-to-day exchange rate determination, countries operating with managed floats often find it necessary to take actions to maintain their desired exchange rate values. They therefore seek to alter the market's valuation of a specific exchange rate by influencing the motivations of market activity, rather than through direct intervention in the foreign exchange markets.

♦ **Parity Conditions:** There are many potential exchange rate determinants. Economists have traditionally isolated several of these determinants and theorized how they are linked with one another and with spot and forward exchange rates. These linkages are called parity conditions. They are useful in explaining and forecasting the long-run trend in an exchange rate.

10.5 MEASURING EXCHANGE RATE MOVEMENTS

All exchange rate measures the value of one currency in units of another currency. A decline in a currency's value is referred to as depreciation, while an increase is referred to as appreciation. Exchange rate movements can be measured directly in different markets.

10.5.1 Exchange Rate Determination in Spot Market

The exchange rate between two currencies in a floating-rate regime is determined by the interplay of demand and supply forces. The exchange rate between say, the rupee and the US dollar depends upon the demand for the US dollar and its availability or supply in the Indian foreign exchange market. The demand for foreign currency comes from individuals and firms who have to make payments in foreign currency mostly on

account of import of goods and services and purchase of securities. The supply of foreign exchange results from the receipt of foreign currency normally on account of export or sale of financial securities to foreign entities.

10.5.2 *Exchange Rate Determination in Forward Market*

Forward exchange rate is normally not equal to the spot rate. The size of forward premium or discount depends mainly on the current expectation of future events. Such expectations determine the trend of the future spot rate towards appreciation or depreciation and thereby determine the forward rate that is equal to, or close to, the future spot rate. Suppose, the dollar is expected to depreciate, then holders of dollars will start selling forward. These actions will help depress the forward rate of the dollar.

10.6 THEORIES OF EXCHANGE RATE

The following are the various theories of exchange rate.

1.   Purchasing Power Parity Theory:

It is the economic theory that price levels between two countries should be equivalent to one another after exchange-rate adjustment. The basis of this theory is the law of one price, where the cost of an identical good should be the same around the world. Based on the theory, if there is a large difference in price between two countries for the same product after exchange rate adjustment, an arbitrage opportunity is created, because the product can be obtained from the country that sells it for the lowest price.

2.   Demand and Supply Theory:

This approach holds that irrespective of what happens to demand and supply of a currency in the foreign exchange market, its exchange rate is determined by interaction of its demand and supply functions. Demand from rupees comes from several sources like Indian exports of goods and services, travel by foreigners in India, and inflows of funds on account of gifts, charities, remittances of earnings from abroad, loans and investment, and so on.

3.   Balance of Payments Theory:

According to the Balance of Payments Theory, under free market conditions is determined by demand and supply conditions in the foreign exchange market. The extent of the demand for the supply of a country's currency in the foreign exchange market depends on its balance of payments position. When the balance of payments is in equilibrium, the supply of and demand for the currency are equal. But when there is a

deficit in the balance of payments, the supply of the currency exceeds its demand and causes a fall in the external value of the currency. When there is a surplus, the demand exceeds the supply, and causes a rise in the external value of the currency.

4. Mint Parity Theory:

When the currency of two countries are on a metallic standard (gold or silver), the rate of exchange between them is determined on the basis of party of mint ratios between the currencies of the two countries. Thus, the theory explaining exchange rate between countries which are on the same standard is known as the Mint Party Theory of foreign exchange rate. Today, none of the modern countries in the world is one gold or metallic standard. Free buying and selling of gold internationally is not permitted, by various governments and as such it is not possible to fix par value in terms of gold content or mint parity and most of the countries today are on paper standard.

5. Monetary Theory:

The monetary theory assumes that PPP holds good, i.e. increase in the price level results in the depreciation of a country's currency and vice versa. With an increase in the real GNP (the real product) of a country results in an increase in the real money demand. Due to this, lesser money is left for purchase of goods, services and bonds. With no change in the money supply, this brings down the price levels. With the reduction in the demand for bonds, the bond prices also go down, resulting in an increase in the nominal interest rates.

6. Portfolio Balance Theory:

The portfolio balance theory suggests that not only the monetary factor but also the holding of financial assets, such as domestic and foreign bonds influences the exchange rate. This theory suggests that exchange rate is determined by the interaction of real income, interest rates, risk, price level and wealth. If a change takes place in these variables, the investor re-establishes a desired balance in its portfolio. The re-establishment of the portfolio balance needs some adjustments which, in turn, influence the demand for foreign assets. Any such change influence the exchange rate.

10.7 CASE STUDY

Case Study 1

1. Alert ltd is planning to import, the machine from Japan at a cost of 340 million Yen. The company can avail loan at 18% per annum with quarterly (quarterly compounding) with which it can import the machine.

   However, there is option from TOKYO by an Indian bank, extending credit of 180days at 2% per annum against opening an irrevocable letter of credit(promissory note) 6month forward quotation INR/JPY 3.45, INR/JPY spot 3.40

Commission charged for letter of credit is 2% p.a which alternative do you prefer.

Case Study 2

2. On 15th Dec. You received a mail order your New York correspondent that an amount of USD 5000 payable to your customer. Calculate the amount that has to be credited to your customer account.

The spot quotation:- is 46.5675 / 6825

The exchange margin is 0.12%

10.8 NOTES

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10.9 SUMMARY

Exchange rate (also known as foreign exchange rate, forex rate or FX rate) is a rate between any two currencies or the rates at which they are exchanged or sold against each other. In the foreign exchange market, currencies of different nations are traded. In the course of exchanging one currency for another, an exchange rate is established. This exchange rate determines how much of one country's currency should be exchanged for that of another. This activity is of particular interest to the government of every nation and to the business community, especially those that deal with the international market. Based on this, business managers would be able to design better policies for their firms when they possess knowledge of the exchange rate.

10.10 KEY WORDS

Exchange Rate

Currensy,

Float

BOP

Interest Rate

10.11 SELF ASSESSMENT QUESTIONS

1. Define Exchange Rate.

2. Elaborate on different kinds of exchange rate system.

3. Discuss on determinants of exchange rates.

4. Illustrate on theories of exchange rates.

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UNIT - 11: INTEREST RATE PARITY (IRP) AND PURCHASING POWER PARITY (PPP) THEORY

Structure :

11.0 OBJECTIVES

After studying this unit, you should be able to:

- define the term purchasing power parity theory

- describe the concept of interest rate parity theory.

- discuss the concepts of international Fishers Effects.

11.1 INTRODUCTION

The International parity relationships are the basis of analysis of exchange rate behavior. In the absence of barriers to international capital movements, there is a relationship between spot exchange rates, forward rates, interest rates and inflation rates. In equilibrium holds differences between forward and spot rates, differences in inflation rates and expected changes in spot rates are equal to one another.

The interest rate parity line establishes the break-even line where the return on a foreign currency investment covered against exchange rate risk is identical with the return on a domestic currency investment. The Fisher conditions are covered next. The International Fisher Effect establishes the breakeven line between investments in domestic securities and investments in foreign securities where the exposure to currency risk is not covered.

The International Fisher Effect predicts that high interest rate currencies tend to depreciate while low interest rate currencies tend to appreciate. The forward rate unbiased condition naturally follows the IRP and International Fisher Effect. The forward rate appears to be unbiased in the sense that periods of positive and negative bias offset each other. The chapter closes with a discussion of the impact that these financial parity conditions have on decisions by private and public policymakers.

11.2 MEANING AND DEFINITIONS

According to this definition, the real exchange rate can be defined in the long run as the nominal exchange rate (e) that is adjusted by the ratio of the foreign price level (Pf) to the domestic price level (P). In terms of this definition, the decline in the r_{ppp} can be interpreted as the real appreciation of the exchange rate.

Purchasing power parity (PPP) involves a relationship between a country's foreign exchange rate and the level or movement of its national price level relative to that of a foreign country. Absolute PPP states that the purchasing power of a unit of domestic

currency is exactly the same in the foreign economy, once it is converted into foreign currency at the absolute PPP exchange rate. Relative PPP implies that changes in national price levels are offset by commensurate changes in the nominal exchange rates between the relevant currencies. The voluminous research literature on PPP published in recent decades has been driven by econometric problems relating to univariate and panel unit root tests of necessary conditions for long-run absolute PPP to hold, in particular whether the real exchange rate has any tendency to settle down to a long-run equilibrium level.1 These include issues such as low power, possible structural breaks, the mixture of stationary and non-stationary error terms in the relevant regressions, and neglected cross-sectional dependence when real exchange rate panel data are used in the foreign exchange market.

According to the generalized International Fisher Theory, the real interest rates should be same across the borders. But the validity of generalized Fisher theory largely depends on the integration of the capital market. That is, the capital in the market needs to be free to flow across borders. Usually the capital markets of the developed countries are integrated in nature. It has been seen that in the underdeveloped countries the currency flow is restricted.

11.3 INTEREST RATE PARITY THEORY (IRP)

The theory of interest rate parity (IRP) provides the linkages between the foreign exchange markets and the international money markets. The theory states that the difference in the national interest rates for securities of similar risk and maturity should be equal to, but opposite in sign to, the forward rate discount or premium for the foreign currency, except for transaction costs. The spot and forward exchange markets are not, however, constantly in the state of equilibrium described by interest rate parity. When the market is not in equilibrium, the potential for riskless or arbitrage profit exists. The arbitrager who recognizes such an imbalance will move to take advantage of the disequilibrium by investing in whichever currency offers the higher return on a covered basis. This is called covered interest arbitrage (CIA).

Interest rate parity (IRP) is a theory used to explain the value and movements of exchange rates. It is also known as the asset approach to exchange rate determination. The interest rate parity theory assumes that the actions of international investors motivated by cross-country differences in rates of return on comparable assets induce changes in the spot exchange rate. In another view, IRP suggests that transactions on a country's financial account affect the value of the exchange rate on the foreign exchange

(Forex) market. This contrasts with the purchasing power parity theory, which assumes that the actions of importers and exporters, whose transactions are recorded on the current account, induce changes in the exchange rate.

Interest rate parity is a no-arbitrage condition representing an equilibrium state under which investors will be indifferent to interest rates available on bank deposits in two countries.[1] The fact that this condition does not always hold allows for potential opportunities to earn riskless profits from covered interest arbitrage. Two assumptions central to interest rate parity are capital mobility and perfect substitutability of domestic and foreign assets. Given market equilibrium, the interest rate parity condition implies that the expected return on domestic assets will equal the exchange rate-adjusted expected return on foreign currency assets.

Interest rate parity has to do with the idea that money should (after adjusting for risk) earn an equal rate of return. Suppose that an investor can earn 6% interest with a dollar deposit in a United States bank, or can earn 4% interest with a British pound deposit in a London bank. The investor can earn greater interest income by keeping funds in dollars and, therefore, one might expect all of his investment funds to flow to U.S. banks. However, exchange rate expectations also come into play. Suppose the investor expects the British pound to appreciate at the rate of 2% in terms of the dollar. That investor would then be indifferent to either investment choice, as both are expected to earn 6% interest to earn future profits is to be earn in the form of currencies.

11.4 KINDS OF INTEREST RATE PARITY THEORY

There are two kinds of interest rate parity theory as follows:

1. Covered Interest Rate Parity (CIRP)

2. Uncovered Interest Rate Parity (UIP)

a) Covered Interest Rate Parity (CIRP):

According to Covered Interest Rate theory, the exchange rate forward premiums (discounts) nullify the interest rate differentials between two sovereigns. In other words, covered interest rate theory says that the difference between interest rates in two countries is nullified by the spot/forward currency premiums so that the investors could not earn an arbitrage profit.

For example, assume Australian Treasury bills are offering an annual interest rate of 1.75%, while U.S. Treasury bills are offering an annual interest rate of 0.5%. If

an investor in the United States seeks to take advantage of the interest rates in Australia, the investor would have to translate U.S. dollars to Australian dollars to purchase the Treasury bill. Thereafter, the investor would have to sell a one-year forward contract on the Australian dollar. However, under the covered interest rate parity, the transaction would only have a return of 0.5%, or else the no-arbitrage condition would be violated.

FORMULA

$$(F-S)/S = (i-i^*)/(1+i^*)$$

Where as,

 S (spot exchange rate) is currently

 F (3-month forward exchange rate) is--initially

 i (base country interest rate) in year

 i* (foreign currency interest rate)

or approximately, $(F-S)/S = i - i^*$

if i* is sufficiently small. This means that

$$F>S \text{ if and only if } i > i^*$$
$$F<S \text{ if and only if } i < i^*$$

The interest rate parity to be covered when the no-arbitrage condition could be satisfied through the use of forward contracts in an attempt to hedge against foreign exchange risk. Conversely, the interest rate parity is said to be uncovered when the no-arbitrage condition could be satisfied without the use of forward contracts to hedge against foreign exchange risk.

The covered interest arbitrage condition is satisfied with the use of a forward contract to hedge against exposure to exchange rate risk, interest rate parity is said to be *covered*. Investors will still be indifferent among the available interest rates in two countries because the forward exchange rate sustains equilibrium such that the dollar return on dollar deposits is equal to the dollar return on foreign deposit, thereby eliminating the potential for covered interest arbitrage profits. Furthermore, covered interest rate parity helps explain the determination of the forward exchange rate.

b) Uncovered Interest Rate Parity (UIP):

Uncovered Interest Rate theory says that the expected appreciation (or depreciation) of a particular currency is nullified by lower (or higher) interest.

FORMULA

$$(1 + i(d)) = E(t + k) / S(t) \times (1 + i(c))$$

$E(t + k) / S(t)$ = the expected <u>rate of change</u> in the <u>exchange rate,</u> which is simply the projected exchange rate at time $(t + k)$ divided by the spot rate at time t

k = the number of time periods into the future from time t

$i(c)$ = the foreign interest rate

$i(d)$ = the domestic interest rate.

The uncovered interest rate parity theory is a powerful idea with real implications. This theory argues that the difference between the risk free interest rates offered for different kinds of currencies will determine the rate at which these currencies can be converted to each other in a forward transaction. To better understand how it all works, let us start by looking at a forward currency transaction.

Illustrations:

1. An American firm purchase $4,000 worth of perfume (FF 20,000) from a French firm. The American distributors must make the payment in 90 days in French Franc. The following quotation and expectations exist for the FF.

Present Spot rate $ 0.2000   US interest rate 15%

90 day forward rate 0.2200   French interest rate 10%

Your expectation of the SR 90 days hence 0.2400.

a. What is the premium of discount on the forward French France? What is the interest differential between US and France? Is there an incentive for covered Interest Arbitrage?

b. If there is a CIA, how can an arbitrageur take advantage of the situation? Assume (i) the arbitrageur is willing to borrow $ 4,000 or FF 20,000 and (ii) there are no transaction costs.

c. If transaction costs are $ 50, would an opportunity still exist for CIA?

Solution:-

a.   Forward premium on $FF = \frac{FR - SR}{SR} \; X \; 4 \; X \; 100$

$$= \frac{.22 - .20}{.20} \; X \; 4 \; X \; 100$$

$$= 40\%$$

The interest differential between US and France is 5%

Yes, there is an incentive for CIA (Outflow of trends from US) as interest differential in favour of France is 5% or 5% in favour of US.

b.   The arbitrageur can take advantage of the situation in the following manner.

i.   Borrow $ 4,000 for 90 days.

       Amount to be repaid after 90 days

       $4,000 \left(4 \; \frac{15}{100} \; X \; \frac{1}{4} \right) = \$ 4.150$

ii.   Convert $ 4,000 into FF at current SR. i.e. $1 = 5FF

       $ 4,000   = FF (4,000 X 5)

                 = FF 20,000

iii.   Invest FF 20,000 in France @ 10% p.a for 90 days.

       Amount received at the end of 90 days = FF 20,500

iv.   Sell investment proceeds forward at rate FF 1 = $ .22

       Amount received in US dollars after 90 days by selling

       FF 20,500   = $ (20,500 X .22)

                    = $ 4510

v.   Amount received $ 4510

       Amount to be paid $ 4150

       Profit $ 360

As the profit of $ 360 > transaction cost of $ 50, opportunity still exists for CIA.

2. **Given the following data:**

(a) Spot rate Rs. 42,0010 per USD

(b) 6 months forward rate ₹ 428020 per USD

(c) Annualized interest rate on 6 month Rupee 12% p.a.

(d) Annualized interest rate on 6 month USD 8% p.a

(e) Explain the arbitrage opportunity if any arbitrager has 1000 dollars

Step - 1

Connected into Indian Rupees   1000 USD X 42.0010

$$= 42,001$$

Step - 2

Deposit the amount in Indian Bank and take a forward contract

Step - 3

Receive amount from the Indian bank

42001 + 42001 X   X

$$= 44.521.06$$

Step - 4

Convert the amount into dollar

$$= 1040.16 \text{ dollar}$$

Stpe-5

Repay the balance to US bank

$$1000 + 1000 \text{ X} \frac{8}{100} \text{ X} \frac{6}{12} = 1040$$

Arbitrage profit $= 1040.16 - 1040$

$$= 0.16 \text{ USD}$$

11.5 PURCHASING POWER PARITY THEORY (PPP)

Purchasing power parity expresses the idea that a bundle of goods in one country should cost the same in another country after exchange rates are taken into account. Suppose that with existing relative prices and exchange rates, a basket of goods can be purchased for fewer U.S. dollars in Canada than in the United States. The expect U.S. consumers to buy those goods in Canada. Even if this is not possible from a transportation or cost viewpoint, some businesses will have an incentive to buy the goods cheaply in Canada and remarket them in the United States. Such actions would cause U.S. dollars to be sold in exchange for Canadian dollars. As a result, the U.S. dollar would depreciate in relation to the Canadian dollar. They expect the currency depreciation to continue until the bundle of goods costs the same in both countries

If the law of one price were true for all goods and services, the purchasing power parity exchange rate could be found from any individual set of prices. By comparing the prices of identical products denominated in different currencies, we could determine the real or PPP exchange rate which should exist if markets were efficient. The hamburger standard, as it has been christened by The Economist, is a prime example of this law of one price. Assuming that the Big Mac, food item sold by McDonalds is indeed identical in all countries, it serves as one means of identifying whether currencies are currently trading at market rates that are close to the exchange rate implied by Big Macs in local currencies. A less extreme form of this principle would say that, in relatively efficient markets, the price of a basket of goods would be the same in each market. This is the absolute version of the theory of purchasing power parity. Absolute PPP state that the spot exchange rate is determined by the relative prices of similar baskets of goods in the state.

If the assumptions of the absolute version of PPP theory are relaxed a bit more, we observe what is termed relative purchasing power parity. This more general idea is that PPP is not particularly helpful in determining what the spot rate is today, but that the relative change in prices between two countries over a period of time determines the change in the exchange rate over that period. More specifically, if the spot exchange rate between two countries starts in equilibrium, any change in the differential rate of inflation between them tends to be offset over the long run by an equal but opposite change in the spot exchange rate.

The Purchasing Power Parity (PPP) theory is one of the early theories of exchange rate determination. This theory is based on the concept that the demand for a country's

currency is derived from the demand for the goods that this country produces. Thus, the exchange rate for a certain country's currency depends on the demand for the goods produced in that country. If prices of goods are low relative to those in other countries, then this exchange rate will be high. The PPP relationship is important because it tells us whether changes in the nominal exchange rate have an impact on real variables such as the value of a firm or the return on a portfolio of assets in the foreign exchange.

The concept of purchasing-power parity (PPP) has two applications: it was originally developed as a theory of exchange rate determination, but it is now primarily used to compare living standards across countries. From the perspective of exchange rate determination, PPP is useful as a reminder that monetary policy has no long-run impact on the real exchange rate. Thus, countries with different inflation rates should expect their bilateral exchange rate to adjust to offset these differentials in the long run. The exchange rate, however, can deviate persistently from its PPP value in response to real shocks. To compare living standards across countries, PPP exchange rates are constructed by comparing the national prices for a large basket of goods and services. These rates are used to translate different currencies into a common currency to measure the purchasing power of per capita income in different countries. A PPP exchange rate constructed in this manner is not, however, an accurate measure of the equilibrium value of the market-determined exchange rate.

FORMULA

The relative version of PPP is calculated as:

$$S = \frac{P_1}{P_2}$$

Whereas,

"S" represents exchange rate of <u>currency</u> 1 to currency 2

"P_1" represents the cost of good "x" in currency 1

"P_2" represents the cost of good "x" in currency 2

Purchasing power parity (PPP) is a theory in economics that approximates the total adjustment that must be made on the currency exchange rate between countries that allows the exchange to be equal to the purchasing power of each country's currency. PPPs is the alternative to using market exchange rates. The actual purchasing power of any currency is the quantity of that currency needed to buy a specified unit of a good or

a basket of common goods and services. PPP is determined in each country based on its relative cost of living and inflation rates. Purchasing power plus parity ultimately means equalizing the purchasing power of two differing currencies by accounting for differences in inflation rates and cost.

Although the current deviation of the exchange rate from the PPP rate indicates that Canadian goods and services are relatively inexpensive by historical standards when compared with those in the United States or in other OECD countries, this deviation from PPP cannot be interpreted as indicating that the Canadian dollar is undervalued by a comparable amount. Fundamentally, exchange rates are influenced by real, as well as monetary, factors. Consequently, the equilibrium value of the exchange rate need not equal its PPP rate.

Illustrations:

1. Assume the spot rate b/w the Indian rupee & U.S dollar is ₹ 47.

The inflation rate in India is 8% & in America is 10% what is the expected forward rate after 1 year

Solution:-

Forward rate: Spot rate $\left(\frac{1+rn}{1+rf}\right)$

Spot rate = 47 $\qquad 47\left(\frac{1+0.08}{1+0.1}\right)$

Rn = 0.08

Rf = 0.10

$$= 47\left(\frac{1.08}{1.1}\right)$$

$$= 47\,(0.9818)$$

$$= 46.1446$$

2. The expected forward rate of GBP is Rs. 72. The Indian Inflation rate is 10% p.a with U.K. is 16% p.a. What is the expected spot rate.

Solution:-

Forward rate:- Spot rate

Forward rate = 72

Rn = 0.1

Rf = 0.16

$$= 72 = SR \left(\frac{1.1}{1.16}\right)$$

$$= 72 = SR \ (0.9482)$$

$$= SR = \frac{72}{0.9482} = 75.933$$

3. Find out the basis as well as further price of euro based on the following date

Spot = USD 0.60 = 1 Euro

Days to maturity = 90 days

3 month interest rate in Germany & USA is 6%, 5% respectively.

Forward price = Spot rate $\left(\dfrac{1 + rn}{1 + rf}\right)$

11.6 THE INTERNATIONAL FISHERS EFFECT

The Fisher effect, named after economist Irving Fisher, states that nominal interest rates in each country are equal to the required real rate of return plus compensation for expected inflation. The relationship between the percentage change in the spot exchange rate over time and the differential between comparable interest rates in different national capital markets is known as the international Fisher effect. Fisher-open as it is often termed, states that the spot exchange rate should change in an amount equal to but in the opposite direction of the difference in interest rates between two countries. Empirical tests lend some support to the relationship postulated by the international Fisher effect, although considerable sort-run deviations occur. However, a more serious criticism has been posed by recent studies that suggest the existence of a foreign exchange risk premium for major currencies. Also, speculation in uncovered interest arbitrage, such as carry trade, creates distortions Thus the expected change in exchange rates might be consistently more than the difference in interest rates.

According to the generalized International Fisher Theory, the real interest rates should be same across the borders. But the validity of generalized Fisher theory largely depends on the integration of the capital market. That is, the capital in the market needs to be free to flow across borders. Usually the capital markets of the developed countries are integrated in nature. It has been seen that in the underdeveloped countries the currency flow is restricted

FORMULA

> **E = [(i1-i2)/(1+i2)]*(i1-i2)**
>
> Where as:
> E represents the percentage change in exchange rate
> i1 represents the interest rate of country A
> i2 represents the interest rate of country B

An **example** may help to understand the value of the theory. For example, if the interest rate of country A is 10% and that of country B is 5%, then the currency of country B should appreciate roughly 5% compared to the currency of country A.

International Fisher Theory hypothesis, the real interest rate in a particular economy is independent of monetary variables. With the assumption that real interest rates are calculated across the countries, it can also be concluded that the country with lower interest rate would also have a lower inflation rate. This will make the real value of the country's currency rise over time. This theory is also known as the assumption of Uncovered Interest Parity.

International Fisher Theory hypothesis, the real interest rate in a particular economy is independent of monetary variables. With the assumption that real interest rates are calculated across the countries, it can also be concluded that the country with lower interest rate would also have a lower inflation rate. This will make the real value of the country's currency rise over time. This theory is also known as the assumption of Uncovered Interest Parity and also states that an estimated change in the current exchange rate between any two currencies is directly proportional to the difference between the two countries' nominal interest rates at a particular time in the period.

The **International Fisher Theory** observation holds that a country with higher interest rate will also be inclined to have a higher inflation rate. The International Fisher Theory also estimates the future exchange rates based on the nominal interest rate relationships. The estimate of the spot exchange rate 12 months from now is calculated by multiplying the current spot exchange rate by the nominal annual U.S. interest rate and then dividing it by the nominal annual British interest rate.

11.7 CASE STUDY

Case Study 1

Given spot rate 1 DEM = Rs. 22.50

1 year forward rate 1 Dem = Rs. 23.25

Interest rate on DEM = 10.2%

Interest rate on Rs. 9.5%

Explain whether there is arbitrage opportunity if

(a)   DEM 1000 is borrowed

(b)   Rs. 10000 is borrowed

Case Study 2

Explain on the basis of the following date whether (a) absolute version of purchasing (b) low of 1 price hold good

U.S			India		
Units	Goods	US dollar	Unit	Goods	Indian Rupees
40	Rice	1	20	Rice	40
20	wheat	2	10	wheat	80

Exchange rate Rs. 40 per U.S dollar

11.8 NOTES

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11.9 SUMMARY

The theory of Purchasing Power Parity postulates that foreign exchange rates should be evaluated by the relative prices of a similar basket of goods between two nations. A possible change in the rate of inflation of a given country should be balanced by the opposite change of country's exchange rate. If prices in the country are surging because of inflation, country's exchange rate should decrease in order to return to parity.

11.10 KEY WORDS

Inflation

Interest Rate

Arbit

11.11 SELF ASSESSMENT QUESTIONS

1. What is Interest Rate Parity?

2. Discuss the kinds of Interest Rate Parity Theory?

3. Elaborate the concept of International Fishers Effect?

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UNIT -12 : EXCHANGE RATE FORCASTING

Structure :

12.0 OBJECTIVES

After studying this unit, you should be able to:

- give the meaning of exchange rate forecasting.

- describe the factors influencing exchange rate.

- discuses the forecasting of exchange rate.

12.1 INTRODUCTION

Exchange rate forecasts play a fundamental role in nearly all aspects of international financial management. Based on the alleged poor performance of popular models of exchange rate determination and on foreign exchange market efficiency, there is considerable skepticism about the possibility of accurate or useful forecasts. A central theme in this chapter is that more insights about exchange rate forecasting are possible if we clearly define the market setting meaning the exchange rate system, the forecasting horizon, and the units of the forecast where we find ourselves. With these factors well specified, this chapter argues that is possible to formulate a sensible, and possibly successful, approach to currency forecasting. The chapter also highlights the difference between accurate and useful forecasts. While economists typically judge a model on the basis of accuracy, professional economists may take a more pragmatic stance and judge a forecast by its ability to achieve correct hedging decision or speculative profits in the currency market. These include short-run forecasts, long-run forecasts, and composite forecasts. The chapter argues that the failure to reject the random-walk model of exchange rates may stem from reliance on linear regression testing. In comparison, technical trend-following rules rely on a nonlinear relationship.

The exchange rate among countries is affected by a large number of factors like rate of inflation, growth prospects, political stability, and economic policies. Most of these factors are difficult to predict in advance. As a result, the future exchange rates, like most of the events, become uncertain. Participants in the international markets therefore, face problems, in making decisions which are based on future exchange rates.

For example, future exchange rates may be required by the companies to hedge against potential losses, arranging short-and long-term funds, performing investment analysis, and to assess earnings of a foreign subsidiary. The quality of decision, in such cases, depends on the accuracy of exchange rate projections. The percentage change between the current and the forecasted exchange rates may be calculated to find our

appreciation or depreciation in the currency. A positive percentage change represents currency appreciation whereas a negative percentage change shows depreciation.

Exchange rate movement is an important subject of macroeconomic analysis and market surveillance. Despite its importance, forecasting the exchange rate level has been a challenge for academics and market practitioners. The collapse of the Bretton Woods system of fixed exchange rates among major industrial countries marked the beginning of the floating exchange rate regime. Since then, there has been considerable interest in forecasting exchange rate movements. However, empirical results from many of the exchange rate forecasting models in the literature, no matter they are based on the economic fundamentals or sophisticated statistical construction, have not yielded satisfactory results. For example, Mussa (1979) concludes that the spot exchange rate approximately follows a random-walk process and most changes in exchange rates are unexpected.

12.2 FACTORS INFLUENCING EXCHANGE RATE

Foreign Exchange being a commodity likes any other commodities the exchange rates tend to fluctuate from time to time. There are various factors that cause the fluctuations in the rates of exchange. These factors can be divided into several following groups. These groups can affect the exchange rates on a short term as well as long-term basis. All of these factors determine the foreign exchange rate fluctuations. If you send or receive money frequently, being up-to-date on these factors will help you better evaluate the optimal time for international money transfer. To avoid any potential falls in currency exchange rates, opt for a locked-in exchange rate service, which will guarantee that your currency is exchanged at the same rate despite any factors that influence an unfavorable fluctuation.

1) Fundamental Factors:

The fundamental factors include all such events that affect the basic economic and fiscal policies of the concerned government. These factors normally affect the long-term exchange rates of any currency. On short-term basis on many occasions, these factors are found to be rather inactive unless the market attention has turned to fundamentals. However, in the long run exchange rates of all the currencies are linked to fundamental causes.

The fundamental factors are basic economic policies followed by the government in relation to inflation, balance of payment position, unemployment, capacity utilization,

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trends in import and export, etc. Normally, other things remaining constant the currencies of the countries that follow sound economic policies will always be stronger. Similarly for the countries which are having balance of payments surplus, the exchange rate will always be favorable. Conversely, for countries facing balance of payment deficit, the exchange rate will be adverse. Continuous and ever growing deficit in balance of payment indicates over valuation of the currency concerned and the dis-equilibrium created can be remedied through devaluation.

2) Political and Psychological Factors:

Political and psychological factors are believed to have an influence on exchange rates. Many currencies have a tradition of behaving in a particular way for e.g. Swiss franc as a refuge currency. The US Dollar is also considered a safer haven currency whenever there is a political crisis anywhere in the world.

3) Exchange rate policy and intervention:

Exchange rates are also influenced in no small measure by expectation of changes in regulation relating to exchange markets and official intervention. Official intervention can smoothen an otherwise disorderly market but it is also the experience that if the authorities attempt half-heartedly to counter the market sentiments through intervention in the market, ultimately more steep and sudden exchange rate swings can occur. In the second quarter of 1985 the movement of exchange rates of major currencies reflected the change in the US policy in favour of co-ordinate exchange market intervention as a measure to bring down the value of the dollar in country.

4) Balance of Payments:

Balance of Payments represents the demand for and supply of foreign exchange which ultimately determine the value of the currency. Exports, both visible and invisible, represent the supply side for foreign exchange. Imports, visible and invisible, create demand for foreign exchange. Put differently, export from the country creates demand for the currency of the country in the foreign exchange market. The exporters would offer to the market the foreign currencies they have acquired and demand in exchange the local currency. Conversely, imports into the country will increase the supply of the currency of the country in the foreign exchange market in the country.

5) Relatively Inflation:

Inflation in the country would increase the domestic prices of the commodities. With increase in prices exports may dwindle because the price may not be competitive. With the decrease in exports the demand for the currency would also decline; this in

turn would result in the decline of external value of the currency. It may be noted that unit is the relative rate of inflation in the two countries that cause changes in exchange rates. If, for instance, both India and the USA experience 10% inflation, the exchange rate between rupee and dollar will remain the same. If inflation in India is 15% and in the USA it is 10%, the increase in prices would be higher in India than it is in the USA. Therefore, the rupee will depreciate in value relative to US dollar in country.

6)   Interest rate:

The interest rate has a great influence on the short – term movement of capital. When the interest rate at a centre rises, it attracts short term funds from other centers. This would increase the demand for the currency at the centre and hence its value. Rising of interest rate may be adopted by a country due to tight money conditions or as a deliberate attempt to attract foreign investment. Whatever be the intention, the effect of an increase in interest rate is to strengthen the currency of the country through larger inflow of investment and reduction in the outflow of investments by the residents of the country.

7)   Money Supply:

An increase in money supply in the country will affect the exchange rate through causing inflation in the country. It can also affect the exchange rate directly. An increase in money supply in the country relative to its demand will lead to large scale spending on foreign goods and purchase of foreign investments. Thus the supply of the currency in the foreign exchange markets is increased and its value declines. The downward pressure on the external value of the currency then increases the cost of imports and so adds to inflation

8)   National Income:

An increase in national income reflects increase in the income of the residents of the country. This increase in the income increases the demand for goods in the country. If there is underutilized production capacity in the country, this will lead to increase in production. There is a chance for growth in exports too. But more often it takes time for the production to adjust to the increased income. Where the production does not increase in sympathy with income rise, it leads to increased imports and increased supply of the currency of the country in the foreign exchange market

9)   Capital Movements:

There are many factors that influence movement of capital from one country to another. Short term movement of capital may be influenced buy the offer of higher interest

in a country. If interest rate in a country rises due to increase in bank rate or otherwise, there will be a flow of short term funds into the country and the exchange rate of the currency will rise. Reverse will happen in case of fall in interest rates

10) Speculation:

Speculation or the anticipation of the market participants many a times is the prime reason for exchange rate movements. The total foreign exchange turnover worldwide is many a times the actual goods and services related turnover indicating the grip of speculators over the market. Those speculators anticipate the events even before the actual data is out and position themselves accordingly to take advantage when the actual data confirms the anticipations. The initial positioning and final profit taking make exchange rates volatile. These speculators many a times concentrate only on one factor affecting the exchange rate and as a result the market psychology tends to concentrate only on that factor neglecting all other factors that have equal bearing on the exchange rate movement. Under these circumstances even when all other factors may indicate negative impact on the exchange rate of the currency if the one factor that the market is concentrating comes out positive the currency strengthens.

11) Others factors:

The turnover of the market is not entirely trade related and hence the funds placed at the disposal of foreign exchange dealers by various banks, the amounts which the dealers can raise in various ways, banks' attitude towards keeping open position during the course of a day, at the end of the day, on the eve of weekends and holidays, window dressing operations as at the end of the half year or year, end of the month considerations to cover operations for the returns that the banks have to submit the central monetary authorities etc. — all affect the exchange rate movement of the currencies.

12.3 CALCULATIONS OF EXCHANGE RATES

Currencies are the backbone of the foreign exchange market. Just like the commodities gold, silver, or grain, currencies are given prices that are representative of their worth. The foreign exchange market's rates, like any other free floating market, are controlled by the forces of supply and demand. Forex trading is a type of investment where a trader speculates on the future movements of different currencies 'exchange rates.

Exchange rates come in pairs, where one country's currency is measured against another countries. Exchange rates affect a country's consumers and producers because

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their economy is engaged in world trade. Most individuals partake in foreign exchange daily, regardless of whether they trade in the forex market, because many common goods like food and clothing are materialized abroad. In order for stores to sell these products, there had to have been a currency transaction between manufacturers abroad and retail sellers at home. The retail store needs to convert some of its revenue into foreign currency in order to pay their foreign suppliers.

12.4 FORCASTING OF EXCHANGE RATE

An exchange rate is the price of one currency expressed in terms of another currency. The exchange rate among countries is affected by a large number of factors like rate of inflation, growth prospects, political stability, and economic policies. Most of these factors are difficult to predict in advance. As a result, the future exchange rates, most of the events, become uncertain. Participants in the international markets, therefore, face problems, in making decisions which are based on future exchange rates. For example, future exchange rates may be required by the companies to hedge against potential losses, arranging short-and long-term funds, performing investment analysis, and to assess earnings of a foreign subsidiary. The quality of decision, in such cases, depends on the accuracy of exchange rate projections.

The percentage change between the current and the forecasted exchange rates may be calculated to find out appreciation or depreciation in the currency. A positive percentage change represents currency appreciation whereas a negative percentage change shows depreciation. The exchange rates may be fixed or floating. Different methods are used to forecast fixed and floating exchange rates. The floating exchange rates are determined by the market forces of demand and supply. These are not influenced by the government intervention. Fixed exchange rates, on the other hand, are decided by the regulating agencies.

The floating exchange rates may be forecast with the help of various methods. Fundamental and technical analyses are commonly used for this purpose. Fundamental analysis studies the relationship between macro economic variables (such as inflation rates, national income growth, and changes in money supply) and exchange rates to forecast the latter. Technical analysis uses past prices and volume movements to project future currency exchange rates. The technical analysis may produce useful results if the past trend is repeated. The companies normally use technical analysis for short-term forecasts. But, they use fundamental analysis for long-term projections. The primary methods of technical analysis are charting and mechanical rules. The reliability of the

forecasts may be found out on the basis of forecasting error which is calculated by root square error.

Fixed exchange rate forecasts are based on the study of government decision – making structure. Attempt is made to determine the pressure to devalue the currency of the nation and the ability of the government to sustain the disequilibrium. Forecasting fixed exchange rates requires an assessment of balance-of-payments disequilibrium on the basis of key economic variables such as inflation, money supply, international reserves, gap between official and market rates, and the balance of foreign trade. The change in the exchange rate required to restore the balance of payment equilibrium is estimated with the help of forward exchange rates, free market rates and the purchasing power parity principle.

The capacity of the country to resist or postpone the use of corrective measures is evaluated on the basis of the ability to borrow hard currencies and the availability of international reserves. Attempt is also made to project the policies which may be followed by the Government to correct the position of the nation. Thus, exchange rates are forecasted to make various decisions by the companies which require foreign exchange. These forecasts are made separately for the fixed and floating exchange rates with the help of different methods. Percentage change between forecasted and current exchange rates may be calculated to find out appreciation or depreciation in the currency.

12.5 MEANING OF EXCHANGE RATE FORECASTING

International transactions are usually settled in the near future. Exchange rate forecasts are necessary to evaluate the foreign denominated cash flows involved in international transactions. Thus, exchange rate forecasting is very important to evaluate the benefits and risks attached to the international business environment. A forecast represents an expectation about a future value or values of a variable.

12.6 REASONS FOR FORECASTING EXCHANGE RATE

The following are the various reasons for forecasting exchange rate:

1. *Hedging decision:*

Hedging is required to done for those payables and receivables which are denominated in foreign currency, and the exchange rate is expected to affect the values of receipts and payments adversely. For Ex: An exporter has a receivable to be received in a month and currency in which this receivable is denominated depreciates, the receipts

will be less than the expected value. Unless the exchange rate is projected for future dates one cannot think of protecting against the loss due to adverse movements in exchange rate.

2.   *Financing decisions*

The financial decisions of MNCs crucially depend on the foreign exchange forecasts. The cost of capital is a crucial determinant of profitability. When the funds are mobilized from the foreign market, the forecast of exchange rates are needed because cost of capital depends on the appreciation of the currency in which the capital is mobilized. If the currency depreciates, the cost of capital is lowered.

a. Short term Financing Decision:

When large corporations borrow, they have access to several different currencies. The borrowing should be done in a currency which has low interest rate and is expected to depreciate. This is because the interest payments will be low over time; and smaller amounts of domestic currency will be needed to repay both interest and principal.

b. Long Term Financing Decision:

The long term financing decisions also depend on future forecasts for longer period horizons. Corporations issue bonds to secure long term funds. These MNCs may consider denominating the bonds in foreign currencies. The corporation would prefer denominating the bonds in currencies which tend to weaken over time.

3.   *Investment Decisions: The investment decisions are of two types:*

a.   **Short term Investment Decisions:** MNCs have substantial excess cash available for short term investment. These corporations have deposits in several currencies. The ideal currency for deposits would be that: a) which has high interest rate; and b) has tendency to appreciate over the investment period.

b.   **Long Term Investment Decisions:** MNCs usually expand by establishing subsidiaries or by acquiring companies abroad. These corporations attempt to determine whether to establish a subsidiary or to acquire a company in a given country. For making this decision, a capital budgeting analysis is done.

4.   *Earning Decisions:*

All the MNCs have to report consolidated earnings of all its subsidiaries to its shareholders. The earnings of subsidiaries initially occur in terms of subsidiary's country's currency. These earnings denominated in foreign currency are translated into

the currency of parent. Transaction is done just to consolidate the subsidiary's balance sheet with the parent. All these activities require forecasts of exchange rates.

12.7 TECHNIQUES OF FORECASTING EXCHANGE RATES

1. Technical Forecasting:

This forecasting involves use of historical exchange rate data to predict future values. For predicting the future movements, two types of methods are used:

i) Charting: in charting everyday rate is plotted on a graph against time. Then peaks, shoulders, triangles or other formations are detected and the forecasting resorted. Basically in technical analysis, a change in trend is identified at an early stage and an effort is made to maintain position as required, unless the weight of the evidence indicates the reversal of the trend. Technical analysis is classified in three types of indicators:

a) Data Indicators: These are market structure indicators. These indicators monitor the trend of various price indices, market breadth, cycles and volumes of currencies traded in order to evaluate the health of bull and bear markets.

b) Sentimental Indicators: These are also called expectation indicators. These indicators monitor the actions of different market participants. The assumption on which these indicators are based is that different groups of participants are consistent in their action at major market turning points. Keeping this indicator in view, the forecasting is resorted.

c) Flow of Fund Indicators: These are another important set of indicators which analyze the financial strength of participants and their capacity and need to buy and sell the currency. The fund flow indicators are balance of trade, currency account balance, balance of payment, debt, etc.

ii) Time Series Modeling: This is also another technique of forecasting exchange rates. The basic assumption of this analysis is also the same as was in the case of charting. This analysis assumes that the exchange rate can be forecasted on the basis of historical movements exhibits in exchange rates. In these models, seasonality and cyclical movements can be incorporated and forecast improved. Basic technique to the time series modeling is that it tries to model the stochastic process which is supposed to generate successive exchange rates or changes in exchange rates.

2. Fundamental Forecasting:

Fundamental forecasting is based on fundamental relationship between economic variables and exchange rate. On the basis of independent fundamental variables along with their historical impact on currency's values, the corporations can develop exchange rate forecast models and use forecasts of making business decisions. The long run exchange rate determination models can be used as forecast models and exchange rate projections made. Similarly, in the case of short run models, the balance of payment, currency account and growth models are based on the fundamental variables determining the exchange rate.

3. Market Based Forecasts:

When the forecasts are made on the basis of market indicators, the forecasting is known as market based forecasting. There are three important market indicators for forecasting exchange rate. These indicators reflect the market sentiments therefore may be used t o forecast the exchange rate.

i) **Spot Rate:** When dollar is expected to appreciate the speculators start buying dollars, thus pushing its price up against rupee immediately. Conversely, if dollar is expected to depreciate, the selling pressure builds up. Thus spot rate is an important indicator of future exchange rate because it reflects the market expectations. This can be used to forecast exchange rate.

ii) **Forward Rate:** Speculative buying and selling of currencies push the forward rate towards the expected future spot rate. If dollar is expected to appreciate in the future and the forward market is not reflecting this sentiment, the speculators would start buying currency if it is expected to appreciate at the future date and push the price to the expected levels.

iii) **Current Account Balance:** current account balance is also an important indicator for forming expectations on future spot rate. If in consecutive months, the current account balance exhibits deficits, the exchange rate is expected to depreciate and if it is exhibiting surplus, the domestic currency is expected to appreciate.

4. Mixed forecasting:

Usually no single forecasting technique has been found to be consistently superior to the others, some MNCs prefer to use a combination of forecasting techniques. This method is referred to as mixed forecasting. Various forecasts for a particular currency value are developed using several forecasting technique. The techniques used are assigned weights in such a way that the weighs total 100 per cent, with the techniques considered

more reliable being assigned higher weights, the actual forecast of the currency is a weighted average of the various forecasts developed.

12.8 CASE STUDY

Case Study 1

Given spot rate 1 DEM = Rs. 22.50

1 year forward rate 1 Dem = Rs. 23.25

Interest rate on DEM = 10.2%

Interest rate on Rs. 9.5%

Explain whether there is arbitrage opportunity if

(a)   DEM 1000 is borrowed

Rs. 10000 is borrowed

Case Study 2

Shrewsbury Herbal Products, located in central England close to the Welsh border, is an old-line producer of herbal teas, seasonings, and medicines. Its products are marketed all over the United Kingdom and in many parts of continental Europe as well. Shrewsbury Herbal generally invoices in British pound sterling when it sells to foreign customers in order to guard against adverse exchange rate changes. Nevertheless, it has just received an order from a large wholesaler in central France for £320,000 of its products, conditional upon delivery being made in three months' time and the order invoiced in Euros.

Shrewsbury's controller, Elton Peters, is concerned with whether the pound will appreciate versus the euro over the next three months, thus eliminating all or most of the profit when the euro receivable is paid. He thinks this is an unlikely possibility, but he decides to contact the firm's banker for suggestions about hedging the exchange rate exposure. Mr. Peters learns from the banker that the current spot exchange rate is €/£ is €1.4537, thus the invoice amount should be €465,184. Mr. Peters also learns that the three-month forward rates for the pound and the euro versus the U.S. dollar are $1.8990/£1.00 and $1.3154/€1.00, respectively. The banker offers to set up a forward hedge for selling the euro receivable for pound sterling based on the €/£ forward cross-exchange rate implicit in the forward rates against the dollar.

QUESTIONS

1. Calculate the exchange rate of Shrewsbury herbal products Ltd?

2. Suggest the solution for the above case in the conversion of foreign currency in forex market?

12.9 NOTES

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12.10 SUMMARY

International transactions are usually settled in the near future. Exchange rate forecasts are necessary to evaluate the foreign denominated cash flows involved in international transactions. Thus, exchange rate forecasting is very important to evaluate the benefits and risks attached to the international business environment. A forecast represents an expectation about a future value or values of a variable. The expectation is constructed using an information set selected by the forecaster.

12.11 KEY WORDS

Forecasting,

Inflation,

Interest Rate,

Speculation,

Nastional Income

Hedging

12.12 SELF ASSESSMENT QUESTION

1.   Explain the various factors effecting exchange rate in brief?

2.   Explain the techniques of forecasting exchange rates?

3.   Define International Fisher Effect and Fisher Effect with the example?

4.   Explain the two versions of PPP theory?

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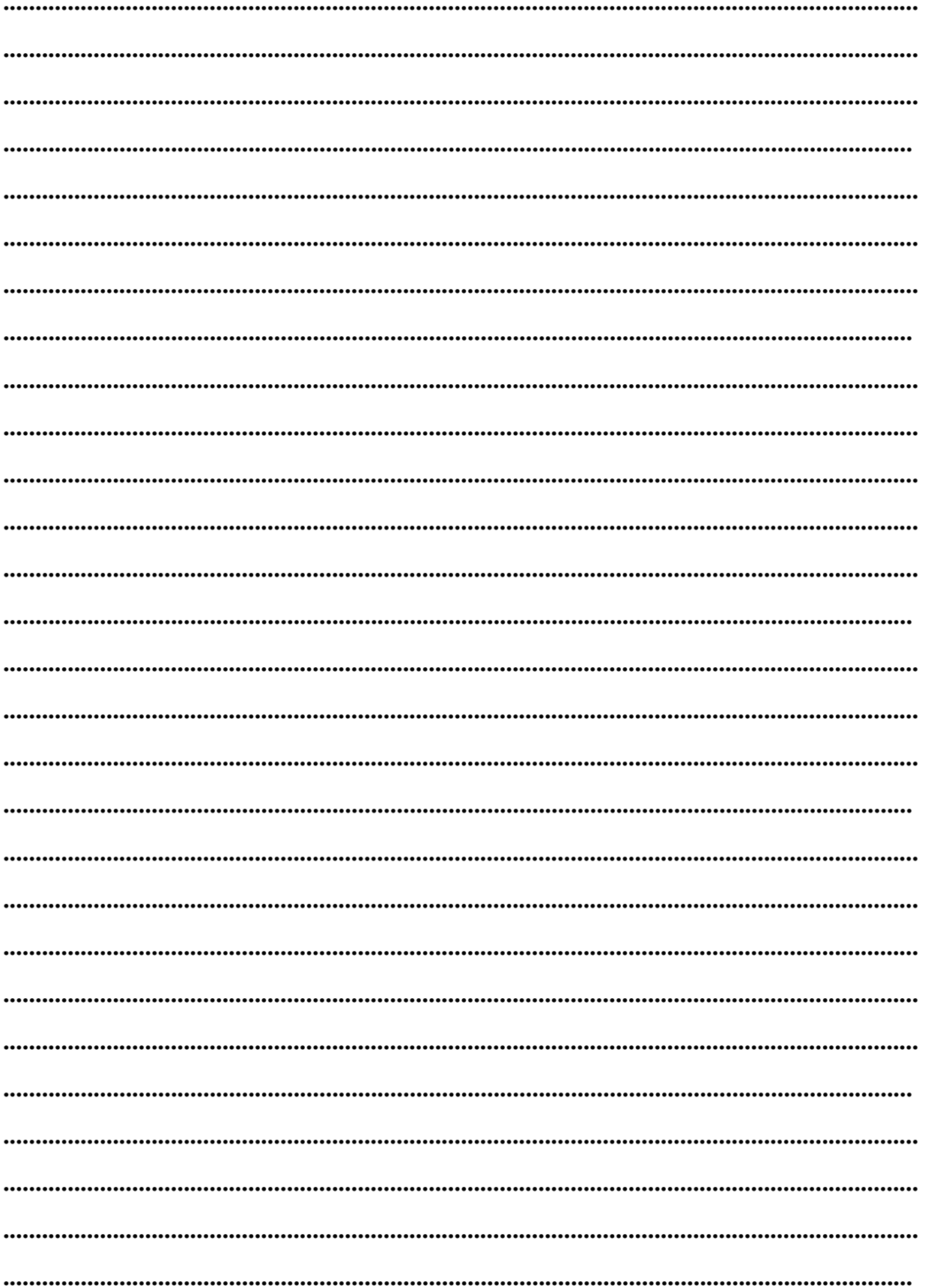
MODULE - IV
FOREIGN EXCHANGE RISK MANAGEMENT

UNIT-13 : MEASUREMENT OF TRANSACTION EXPOSURE, TRANSLATION EXPOSURE AND ECONOMIC EXPOSURE

Structure :

13.0 OBJECTIVES

After studying this unit, you should be able to;

- • Explain how transaction exposure can be measured,

- • Explain how economic exposure can be measured,

- • Explain how translation exposure can be measured, and

- • Discuss the relevance of an MNC's exposure to ex- change rate risk.

13.1 INTRODUCTION

Liberalization of financial markets has enhanced corporate risk significantly. Corporate treasurers have become increasingly concerned about exchange rate risk. It is primarilydue to significant increase in international capital flows and exposure to different currencies.

Foreign exchange exposure is a measure of the potential for firm's profitability, net cash flow and market value to change because of a change in exchange rates. An importance task of the financial manager is to measure foreign exchange exposure and to manage it so as to maximize the profitability, net cash flow and market value of the firm.

With the liberalization of foreign exchange market, firms all over the world have aware of the fact that fluctuations in exchange rates expose their revenues, costs, operating cashflows and their market value to substantial fluctuations. Firms which have exports and imports of goods and services, foreign currencies borrowings and lending, foreign investments are directly exposed to currencies fluctuations.

Contractually fixed payments and receipts in foreign currency such as export receivables,imports payables, interest payables on foreign currency loans and so forth do not vary with exchange rate changes. Hence, these are called contractual exposures. On the other hand, anunanticipated change in the foreign exchange rate has an impact on the cash flows of day-today transactions.

The sensitivity of the home currency value of assets and liabilities which are denominated in foreign currencies to unanticipated changes in exchange rate is known as transaction exposures.

The unanticipated changes in the exchange rate also have effect on the future sales volume,prices and costs. These types of exposures are known as operating exposure, economic exposure, or strategic exposure. It measures the change in the present value

of the firm resulting from any change in future operating cash flows of the firm caused by an unanticipated change in exchange rates.

Other kind of short-term exposure is known as Translation Exposure or Accounting Exposure. It is the potential for accounting derived changes in owner's equity to occur because of the need to "translate" foreign currency financial statements of foreign subsidiaries into a single reporting currency to prepare worldwide consolidated financial statements. The key difference between transaction and translation exposure is that the formerhas impact on cash flows while the latter has no direct effect on cash flows. However, there is board agreement among finance theorists that translation losses and gain are only notionalaccounting losses and gains.

Exchange rate risk can be broadly deûned as the risk that a company's performance will be affected by exchange rate movements. Multinational corporations (MNCs) closely monitor their operations to determine how they are exposed to various forms of exchange rate risk. Financial managers must understand how to measure the exposure of their MNCs to exchange rate ûuctuations so that they can determine whether and how to protect their companies from that exposure.

As mentioned in the previous modules, exchange rates cannot be forecasted with perfect accuracy, but the firm an at least measure its exposure to exchange rate fluctuations.If the firm is highly exposed to exchange rate fluctuations, it can consider techniquesto reduce its exposure. Such techniques are identified in the following module. Before choosing among them, the firm should first measure its degree of exposure.

Exposure to exchange rate fluctuations comes in three forms:

- Transaction exposure
- Economic exposure
- Translation exposure

Measurement of each type of exposure will be discussed in turn.

13.2 RISK AND EXPOSURES: A FORMAL APPROACH

As discussed, the value of foreign currencies denominated assets and liabilities change their values because of fluctuations in foreign currencies. These changes are primarily unanticipated and it may cause by variations in short-term interest rates, inflation, tax, equity market return,expectation etc.

♦ Change in the real domestic-currency value of an item: ÄV

♦ Spot Exchange rate, expressed as number of rupee per US$: S

♦ Unanticipated change (appreciation or depreciation of rupee) in the value of the risk factor: ÄSU

Any appreciation or depreciation of rupee has its impact on the domestic currency value of theitem (V). In other words, there is a functional relationship between ÄV and ÄSU. Let us estimatea regression equation, considering change in domestic value of the item as dependent variableland change in the rupee-dollar exchange rate as independent variable. The estimated equationmay take the following form:

$$\Delta V = \beta 0 + \beta 1\ \Delta SU$$

â1 is the slope co-efficient, indicating the sensitivity of change in the value of V to change in S.The slope co-efficient measure the exposure with respect to the corresponding exchange rate.

13.3 TRANSACTION EXPOSURE

The value of a firm's future contractual transactions in foreign currencies is affected by exchange rate movements. The sensitivity of the firm's contractual transactions in foreign currencies to exchange rate movements is referred to as transaction exposure.

Transaction exposure can have a substantial impact on a firm's value. It is not unusual for acurrency to change by as much as 10 percent in a given year. If an exporter denominates itsexports in a foreign currency, a 10 percent decline in that currency will reduce the dollar value ofits receivables by 10 percent. This effect could possibly eliminate any profits from exporting.

Transaction exposure measures gains or losses that arise from the settlement of existing financial obligations the term of which are stated in a foreign currency. Transaction exposure arises from:

♦ Purchasing or selling on credit goods and services when prices are stated in foreigncurrencies.

♦ Borrowing or lending funds when repayment is to be made in a foreign currency.

♦ Acquiring assets or incurring liabilities denominated in foreign currencies.
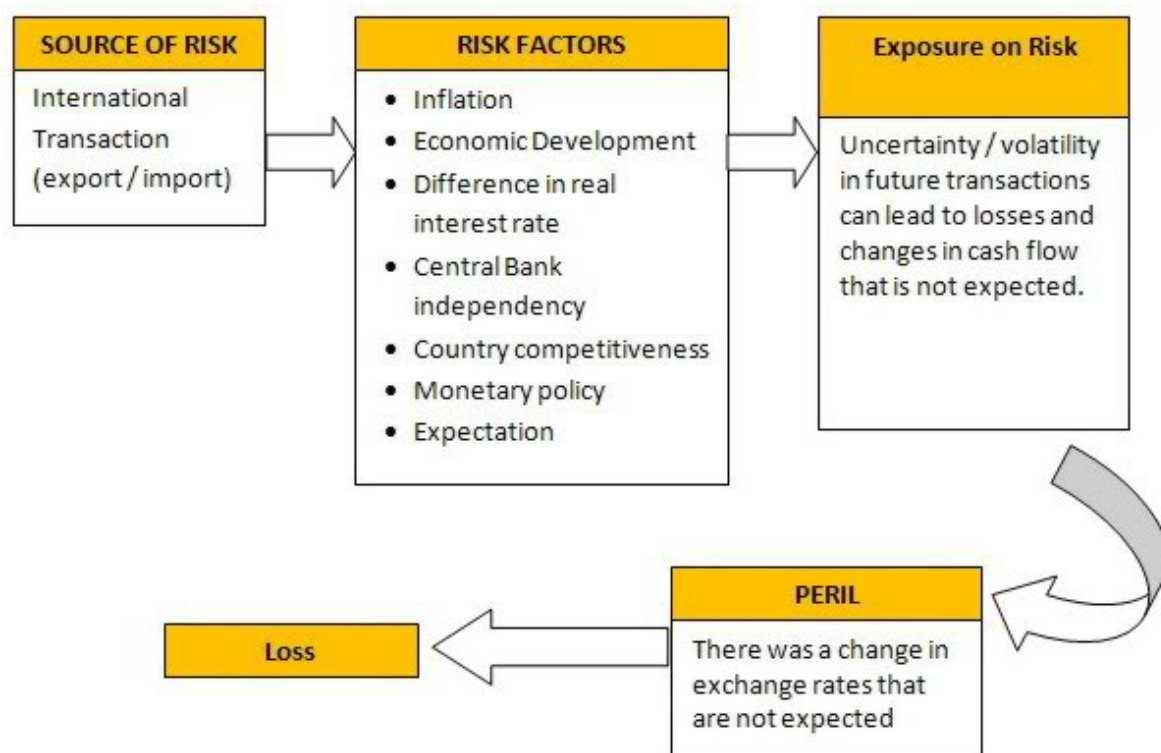
Foreign currencies denominated receivables or payables are common types of transaction exposures. A transaction exposure is actually created at the first moment the seller quotes a pricein foreign currency term to a potential buyer. With the placing of the order, the potentialexposure created at the time of the quotation is converted into actual exposure, called "backlogexposure" because the product has not yet been shipped or billed. Backlog exposure lasts until the goods are shipped and billed, at which time it becomes "billing exposure". Billing exposureremains until actual payment is received by the seller.

Open Account: Purchasing and Selling

An Indian firm sells merchandise on open account to a US buyer for US$ 2, 85,000/- payment tobe made in 30 days. The current exchange rate is Rs.48/- per US$ and the Indian seller expects toexchange the US$ received for Rs.136, 80,000/- when payment

is received. In this case,transaction exposure arises because of the risk that the Indian seller will receive something otherthan the Rs.136, 80,000/- expected. If US$ depreciate then the Indian seller would receive lessand it may happen that Indian rupee depreciate where the Indian seller get more than theexpected. Thus, exposure is the chance of either a loss or gain.

Borrowing and Lending

Transaction exposure can also arise when foreign currency denominated borrowings or lending'sare involved. An Indian company has long-term exposure in the form of commercial borrowingin US Debt market. It has taken a commercial loan of US$ 200 million in 2002 denominated inUS$ and need to repay also in US$ after 10 years. The interest rate for the same loan is linked to6-month LIBOR and payment will be made in US$.

In the above case the Company is exposed to transaction exposure both for payment of interestand principal amounts. In case of interest payment the Company would face the risk of LIBORvolatility and also the transaction exposure for exchange rate volatility. When the principalpayment due, the long-term exchange rate change can create fundamental transaction exposurefor the Company.

Principal Payment of US$200 Million

	2002	2005	2008	2012
Rs. Per US$	38.45	41.55	48.75	55.7
Principal Amount (Rs. In Millions)	7690	8310	9750	11140
Transaction Exposure (Rs.in Million)		620	2060	3450

With the change in exchange rate, every year there will be a change in the value of the principaland hence create transaction exposure.

Interest Payment for US$200 Million

	Sept -02	Mar-03	Sept-03	Mar-04
Rs. Per US$	38.45	41.55	48.75	55.70
6-Month Libor rate	6.25%	6.85%	7.05%	7.25%
Interest Amount (US$ Million)	6.25	6.85	7.05	7.25
Interest Amt in Rs Million	240.31	284.62	343.69	403.83
Transaction Exposure (Rs. Million)		21.24	50.76	50.39

Interest payment will be made half yearly basis which is linked to 6-month LIBOR. Hence, the interest amount will be fixed at the end of six month and it need to be paid in US$. Sinceexchange rate is changing, payment of interest itself creates transaction exposure. In Sept-02 the Company paid interest amount half yearly at the rate of 6.25% amounting to Rs.240.31 million when the exchange rate was Rs.38.45 per US$. In Mar-03 the company paid interest amount halfyearly at the rate of 6.85% amounting to Rs.284.62 million when the rupee depreciated toRs.41.55 per US$. Hence the transaction exposure is Rs.21.24 million {(Rs.41.55*6.85%-Rs.38.45*6.85%)*(200/2)}.

To assess transaction exposure, an MNC needs to

1. Estimate its net cash flows in each currency

2. Measure the potential impact of the currency exposure.

13.3.1 Estimating "Net" Cash Flows in Each Currency

MNCs tend to focus on transaction exposure over an upcoming short-term period (such as thenext month or the next quarter) for which they can anticipate foreign currency cash flows with reasonable accuracy. Since MNCs commonly have foreign subsidiaries spread around the world,they need an information system that can track their currency positions. The Internet enables allsubsidiaries to tap into the same network and provide information on their existing and expected future currency positions.

To measure its transaction exposure, an MNC needs to project the consolidated net amount in currency inflows or outflows for all its subsidiaries, categorized by currency. One foreign subsidiary may have inflows of a foreign currency while another has outflows of that same currency. In that case, the MNC's net cash flows of that \currency

overall may be negligible. If most of the MNC's subsidiaries have future inflows in another currency, however, the net cash flows in that currency could be substantial. Estimating the consolidated net cash flows per currency is a useful first step when assessing an MNC's exposure because it helps to determine the MNC's overall position in each currency.

Example:

Miami Co. conducts its international business in four currencies. Its objective is to first measure its exposure in each currency in the next quarter and then estimate its consolidated cash flows for one quarter ahead, as shown in Exhibit 13.1. For example, Miami expects Canadian dollar inflows of C$12 million and outflows of C$2 million over the next quarter. Thus, Miami expects net inflows of C$10 million. Given an expected exchange rate of $.80 at the end of the quarter, it can convert the expected net inflow of Canadian dollars into an expected net inflow of $8 million (estimated as C$10 million x$.80).

The same process is used to determine the net cash flows of each of the other three currencies.Notice from the last column of Exhibit 13.1 that the expected net cash flows in three of the currencies are positive, while the net cash flows in Swedish kronor are negative (reflecting cashoutflows). Thus, Miami will be favorably affected by appreciation of the pound, Canadian dollar, and Mexican peso. Conversely, it will be adversely affected by appreciation of the krona.

The information in Exhibit 13.1 needs to be converted into dollars so that Miami Co. can assess the exposure of each currency by using a standardized measure. For each currency, the net cash flows are converted into dollars to determine the dollar amount of exposure. Notice that Miami has a smaller dollar amount of exposure in Mexican pesos and Canadian dollars than in the other currencies. However, this does not necessarily mean that Miami will be less affected by these exposures, as will be explained shortly.

Exhibit 13.1 Consolidated Net Cash Flow Assessment of Miami Co.

Currency	Total Inflow	Total Outflow	Net Inflow or Outflow	Epected Exchange Rate at End of Quarter	Net Inflow or Outflow as Measured in U.S. Dollars
British pound	£17,000,000	£7,000,000	+ £10,000,000	$1.50	+$15,000,000
Canadian dollar	C$12,000,000	C$2,000,000	+C$10,000,000	$.80	+ $ 8,000,000
Swedish krona	SK20,000,000	SK120, 000,000	-SK100,000,000	$.15	-$15,000,000
Mexican peso	MXP90,000,000	MXP10,000,000	+ MXP80,000,000	$.10	+ $ 8,000,000

Exhibit 13.2Estimating the Range of Net Inflows or Outflows for Miami Co.

Currency	Net Inflow or Outflow	Range of Possible Exchange Rates at End of Quarter	Range of Possible Net Inflows or Outflows in U.S. Dollars(Based on Range of Possible Exchange Rates)
British pound	+ £10,000,000	$1.40 to $1.60	+ $14,000,000 to + $16,000,000
Canadian dollar	+ C$10,000,000	$.79 to $.81	+ $ 7,900,000 to + $ 8,100,000
Swedish krona	-SK100,000,000	$.14 to $.16	- $14,000,000 to - $16,000,000
Mexican peso	MXP80,000,000	$.08 to $.11	+ $ 6,400,000 to + $ 8,800,000

Recognize that the net inflows or outflows in each foreign currency and the exchange rates at theend of the period are uncertain. Thus, Miami might develop a range of possible exchange ratesfor each currency, as shown in Exhibit 13.2, instead of a point estimate. In this case, there is arange of net cash flows in dollars rather than a point estimate. Notice that the range of dollar cash flows resulting from Miami's peso transactions is wide, reflecting the high degree of uncertainty surrounding the peso's value over the next quarter. In contrast, the range of dollar cash flows resulting from the Canadian dollar transactions is narrow because the Canadian dollar is expected to be relatively stable over the next quarter.

Miami Co. assessed its net cash flow situation for only one quarter. It could alsoderive itsexpected net cash flows for other periods, such as a week or a month. SomeMNCs assess their transaction exposure during several periods by applying the methodsjust described to eachperiod. The further into the future an MNC attempts tomeasure its transaction exposure, the less accurate will be the measurement due to the greater uncertainty about inflows or outflows in each foreign currency, as well as future exchange rates, over periods further into the future. AnMNC's overall exposurecan be assessed only after considering each currency's variability andthe correlationsamong currencies. The overall exposure of Miami Co. will be assessed after the following discussion of currency variability and correlations.

13.3.2 *Measure the potential impact of the currency exposure.*

The dollar net cash ûows of an MNC are generated from a portfolio of currencies. The exposure of the portfolio of currencies can be measured by the standard deviation of the portfolio, which indicates how the portfolio's value may deviate from what is expected. Consider an MNC thatwill receive payments in two foreign currencies. The risk (as measured by the standard deviation of monthly percentage changes) of a two-currency portfolio (σ_p) can be estimated as follows:

$$\sigma_p = \sqrt{w_x^2 \sigma_x^2 + w_y^2 \sigma_y^2 + 2w_x w_y \sigma_x \sigma_y CORR_{xy}}$$

Where

W_X - Proportion of total portfolio value that is in currency X

W_Y - Proportion of total portfolio value that is in currency Y

σ_X - Standard deviation of monthly percentage changes in currency X

σ_Y - Standard deviation of monthly percentage changes in currency Y

$CORR_{XY}$ - Correlation coefficient of monthly percentage changes between currencies X andY

The equation shows that an MNC's exposure to multiple currencies is influenced by the variability of each currency and the correlation of movements between the currencies. Thevolatility of a currency portfolio is positively related to a currency's volatility and positivelyrelated to the correlation between currencies. Each component in the equation that affects a currency portfolio's risk can be measured using a series of monthly percentage changes in each currency. These components are described in more detail next.

Measurement of Currency Variability:

The standard deviation statistic measures the degree of movement for each currency. In any given period, some currencies clearly fluctuate much more than others. For example, the standard deviations of the monthly movements in the Japanese yen and the Swiss franc are typically more than twice that of the Canadian dollar. Based on this information, the potential for substantial deviations from the projected future values is greater for the yen and the Swiss franc than for the Canadian dollar (from a U.S. ûrm's perspective). Some currencies in emerging markets are very volatile.

Currency Variability over Time:

The variability of a currency will not necessarily remain consistent from one time period to another. Nevertheless, an MNC can at least identify currencies whose values are most likely to be stable or highly variable in the future. For example, the Canadian dollar consistently exhibits lower variability than other currencies, regardless of the period that is assessed.

Measurement of Currency Correlations:

The correlations among currency movements can be measured by their correlation coefficients, which indicate the degree to which two currencies move in relation to each other. The extreme case is perfect positive correlation, which is represented by a correlation coefficient equal to 1.00. Correlations can also be negative, reflecing an inverse relationship between individual movements, the extreme case being - 1.00.

Exhibit 13.3 shows the correlation coefûcients (based on quarterly data) for several currency pairs. It is clear that some currency pairs exhibit a much higher correlation than others. The European currencies are highly correlated, whereas the Canadian dollar has a relatively low correlation with other currencies. Currency correlations are generally positive; this implies that currencies tend to move in the same direction against the U.S. dollar (though by different degrees). The positive correlation may not always occur on a day-to-day basis, but it appears to hold over longer periods of time for most currencies.

Exhibit 13.3 Correlations among Exchange Rate Movements

	British Pound	Canadian Dollar	Euro	Japanese Yen	Swedish Krona
British Pound	1.00				
Canadian Dollar	0.35	1.00			
Euro	0.91	0.48	1.00		
Japanese Yen	0.71	0.12	0.67	1.00	
Swedish Krona	0.83	0.57	0.92	0.64	1.00

Applying Currency Correlations to Net Cash Flows:

The implications of currency correlations for a particular MNC depend on the cash flow characteristics of that MNC. The equation for a portfolio's standard deviation suggests that positive cash ûows in highly correlated currencies result in higher exchange rate risk for the MNC. However, many MNCs have negative net cash flow positions in some currencies; in these situations, the correlations can have different effects on the MNC's exchange rate risk.

Currency Correlations over Time:

An MNC cannot use previous correlations to predict future correlations with perfect accuracy. Nevertheless, some general relationships tend to hold over time. For example, movements in the values of the pound, the euro, and other European currencies against the U.S. dollar tend to be highly correlated in most periods. In addition, the Canadian dollar tends to move independently of other currency movements.

Assessing Transaction Exposure Based on Value at Risk:

A related method for assessing exposure is the value-at-risk (VAR) method, which measures the potential maximum one-day loss on the value of positions of an MNC that is exposed to exchange rate movements. The maximum one-day loss of a currency is dependent on three factors. First, it is dependent on the expected percentage change in the currency for the next day. Second, the maximum one-day loss is dependent on the conûdence level used. A higher confidence level will cause a more pronounced maximum one-day loss, holding other factors constant. If the conûdence level in the example is 97.5 percent instead of 95 percent, the lower boundary is 1.96 standard deviations from

the expected percentage change. Third, the maximum one-day loss is dependent on the standard deviation of the daily percentage changes in the currency over a previous period.

Applying VAR to Longer Time Horizons:

The VAR method can also be used to assess exposure over longer time horizons. The standard deviation should be estimated over the time horizon in which the maximum loss is to be measured.

Applying VAR to Transaction Exposure of a Portfolio:

Since MNCs are commonly exposed to more than one currency, they may apply the VAR method to a currency portfolio. When considering multiple currencies, software packages can be used to perform the computations.

Applying VAR to Transaction Exposure of a Portfolio:

Since MNCs are commonly exposed to more than one currency, they may apply the VAR method to a currency portfolio. When considering multiple currencies, software packages can be used to perform the computations. An example of applying VAR to a two-currency portfolio is provided here.

13.4 ECONOMIC EXPOSURE

The value of a ûrm's cash flows can be affected by exchange rate movements if it executes transactions in foreign currencies, receives revenue from foreign customers, or is subject to foreign competition. The sensitivity of the firm's cash flows to exchangerate movements is referred to as economic exposure (also sometimes referred to as operating exposure). Transaction exposure is a subset of economic exposure. But economic exposure also includes other ways in which a ûrm's cash ûows can be affected by exchange rate movements

Example

Intel invoices about 65 percent of its chip exports in U.S. dollars. Although Intel is not subject to transaction exposure for its dollar-denominated exports, it is subject to economic exposure. If the euro weakens against the dollar, the European importers of those chips from Intel will need more euros to pay for them. These importers are subject to transaction exposure and economic exposure. As their costs of importing the chips increase in response to the weak euro, they may decide to purchase chips from European manufacturers instead. Consequently, Intel's cash ûows from its exports will be reduced, even though these exports are invoiced in dollars.

Exhibit 13.4 provides examples of how a firm is subject to economic exposure. Consider each example by itself as if the firm had no other international business. Since the first two examples involve contractual transactions in foreign currencies, they reflect transaction exposure. The remaining examples do not involve contractual transactions in foreign currencies and therefore do not reflect transaction exposure. Yet, they do reflect economic exposure because they affect the firm's cash flows. If a firm experienced the exposure described in the third and fourth examples but did not have any contractual transactions in foreign currencies, it would be subject to economic exposure without being subject to transaction exposure.

Exhibit 13.4 Examples That Subject a Firm to Economic Exposure

A U.S. Firm:	U.S. Firm's Dollar Cash Flows Are Adversely Affected If the:
1. Has a contract to export products inwhich it agreed to accept euros.	Euro depreciates
2. Has a contract to import materials that are priced in Mexican pesos.	Peso appreciates.
3. Exports products to the United Kingdom that are located in the United Kingdom.	Pound depreciates (causing some priced in dollars, and competitors are customers to switch to the competitors).
4. Sells products to local customers, and its main competitor is based in Belgium.	Euro depreciates(causing some customers to switch to the competitors).

Some of the more common international business transactions that typically subject an MNC's cash flows to economic exposure are listed in the first column of Exhibit 13.5. Transactions listed in the exhibit that require conversion of currencies, and thus reflect transaction exposure, include exports denominated in foreign currency, interest received from foreign investments, imports denominated in foreign currency, and interest owed on foreign loans. The other transactions, which do not require conversion of currencies and therefore do not reflect transaction exposure, are also a form of economic exposure because the cash flows resulting from these transactions can be influenced by exchange rate movements. Exchange rate movements can have as large an effect on cash flows from these transactions as on cash flows from transactions that require currency conversion. The second and third columns of Exhibit 13.5 indicate

how each transaction can be affected by the appreciation and depreciation, respectively, of the ûrm's home (local) currency.

Exhibit 13.5 Economic Exposure to Exchange Rate Fluctuations

Transactions That Influence the Firm's Local Currency Inflows		Impact of Local Currency Appreciation on Transactions	Impact of Local Currency Depreciation on Transactions
Local sales (relative to foreign competition in local markets)		Decrease	Increase
Firm's exports denominated in local currency		Decrease	Increase
Firm's exports denominated in foreign currency		Decrease	Increase
Interest received from foreign investments		Decrease	Increase
Transactions That Influence the Firm's Local Currency Outflows			
Firm's imported supplies denominated in local currency		No change	No change
Firm's imported supplies denominated in foreign currency		Decrease	Increase
Interest owed on foreign funds borrowed		Decrease	Increase

13.4.1 Economic Exposure to Local Currency Appreciation

The following discussion is related to the second column of Exhibit 13.5. Local sales (in the firm's home country) are expected to decrease if the local (home) currency appreciates because the ûrm will face increased foreign competition. Local customers will be able to obtain foreign substitute products cheaply with their strengthened currency. Cash inflows from exports denominated in the local currency will also likely be reduced as a result of appreciation in that currency because foreign importers will need more of their own currency to pay for these products. Any interest or dividends received from foreign investments will also convert to a reduced amount if the local currency has strengthened.

With regard to the ûrm's cash outûows, the cost of imported supplies denominated in the local currency will not be directly affected by changes in exchange rates. If the local currency appreciates, however, the cost of imported supplies denominated in the foreign currency will be reduced. In addition, any interest to be paid on ûnancing in

foreign currencies will be reduced (in terms of the local currency) if the local currency appreciates because the strengthened local currency will be exchanged for the foreign currency to make the interest payments.

Thus, appreciation in the ûrm's local currency causes a reduction in both cash inûows and outûows. The impact on a ûrm's net cash ûows will depend on whether the inûow transactions are affected more or less than the outûow transactions. If, for example, the ûrm is in the exporting business but obtains its supplies and borrows funds locally, its inûow transactions will be reduced by a greater degree than its outûow transactions. In this case, net cash ûows will be reduced. Conversely, cash inûows of a ûrm concentrating its sales locally with little foreign competition will not be severely reduced by appreciation of the local currency. If such a ûrm obtains sup- plies and borrows funds overseas, its outûows will be reduced. Overall, this ûrm's net cash ûows will be enhanced by the appreciation of its local currency.

13.4.2 Economic Exposure to Local Currency Depreciation

If the ûrm's local currency depreciates (see the third column of Exhibit 13.5), its transactions will be affected in a manner opposite to the way they are inûuenced by appreciation. Local sales should increase due to reduced foreign competition becauseprices denominated in strong foreign currencies will seem high to the local customers. The ûrm's exports denominated in the local currency will appear cheap to importers, thereby increasing foreign demand for those products. Even exports denominated in the foreign currency can increase cash ûows because a given amount in foreign currency inûows to the ûrm will convert to a larger amount of the local currency. In addition, interest or dividends from foreign investments will now convert to more of the local currency.

With regard to cash outûows, imported supplies denominated in the local currency will not be directly affected by any change in exchange rates. The cost of imported supplies denominated in the foreign currency will rise, however, because more of the weakened local currency will be required to obtain the foreign currency needed. Any interest payments paid on ûnancing in foreign currencies will increase.

In general, depreciation of the ûrm's local currency causes an increase in both cash inflows and outflows. A ûrm that concentrates on exporting and obtains supplies and borrows funds locally will likely benefit from a depreciated local currency. This is the case for Caterpillar, Ford, and General Motors in periods when the dollar weakens substantially against most major currencies. Conversely, a firm that concentrates on

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local sales, has very little foreign competition, and obtains foreign supplies (denominated in foreign currencies) will likely be hurt by a depreciated local currency.

13.4.3 Economic Exposure of Domestic Firms

Although our focus is on the ûnancial management of MNCs, even purely domestic ûrms are affected by economic exposure.

Example

Burlington, Inc. is a U.S. manufacturer of steel that purchases all of its supplies locally and sells all of its steel locally. Because its transactions are solely in the local currency, Burlington is not subject to transaction exposure. It is subject to economic exposure, however, because it faces foreign competition in its local markets. If the exchange rate of the foreign competitor's invoice currency depreciates against the dollar, customers interested in steel products will shift their purchases toward the foreign steel producer. Consequently, demand for Burlington's steel will likely decrease, and so will its net cash inflows. Thus, Burlington is subject to economic exposure even though it is not subject to transaction exposure.

13.5 MEASURING ECONOMIC EXPOSURE

Since MNCs are affected by economic exposure, they should assess the potential degree of exposure that exists and then determine whether to insulate themselves against it.

Using Sensitivity Analysis to Measure Economic Exposure:

One method of measuring an MNC's economic exposure is to separately consider how sales and expense categories are affected by various exchange rate scenarios.

Example:

Madison Co. is a U.S.-based MNC that purchases most of its materials from Canada and generates a small portion of its sales from exporting to Canada. Its U.S. sales are denominated in U.S. dollars, while its Canadian sales are denominated in Canadian dollars (C$). The estimates of its cash flows are shown in Exhibit 13.8 separated by country.

Assume that Madison Co. expects three possible exchange rates for the Canadian dollar over the period of concern: (1) $.75, (2) $.80, or (3) $.85. These scenarios are separately analyzed in the second, third, and fourth columns of Exhibit 13.6. Row 1 is constant across scenarios since the U.S. business sales are not affected by exchange rate movements. In row 2, the estimated U.S. dollar sales due to the Canadian business are determined by

converting the estimated Canadian dollar sales into U.S. dollars. Row 3 is the sum of the U.S. dollar sales in rows 1 and 2.

Row 4 is constant across scenarios since the cost of materials in the United States is not affected by exchange rate movements. In row 5, the estimated U.S. dollar cost of materials due to the Canadian business is determined by converting the estimated Canadian cost of materials into U.S. dollars. Row 6 is the sum of the U.S. dollar cost of materials in rows 4 and 5.

Row 7 is constant across scenarios since the U.S. operating expenses are not affected by exchange rate movements. Row 8 is constant across scenarios since the interest expense on U.S. debt is not affected by exchange rate movements. In row 9, the estimated U.S. dollar interest expense from Canadian debt is determined by converting the estimated Canadian interest expenses into U.S. dollars. Row 10 is the sum of the U.S. dollar interest expenses in rows 8 and 9.

The effect of exchange rates on Madison's revenues and costs can now be reviewed. Exhibit 13.6 illustrates how the dollar value of Canadian sales and Canadian cost of materials would increase as a result of a stronger Canadian dollar. Because Madison's Canadiancost of materials exposure (C$200 million) is much greater than its Canadian sales exposure (C$4 million), a strong Canadian dollar has a negative overall impact on its cash flow. The total amount in U.S. dollars needed to make interest payments is also higher when the Canadian dollar is stronger. In general, Madison Co., would be adversely affected by a stronger Canadian dollar. It would be favorably affected by a weaker Canadian dollar because the reduced value of total sales would be more than offset by the reduced cost of materials and interest expenses

Estimated Sales and Expenses for Madison's U.S. and Canadian Business Segments (in Millions)

Particulars	U.S. Business	Canadian Business
Sales	$320	C$4
Cost of materials	$50	C$200
Operating expenses	$60	—
Interest expenses	$3	C$10
Cash flows	$207	C$206

Exhibit 13.6 Impact of Possible Exchange Rates on Cash Flows of Madison Co. (in Millions)

Particulars	Exchange Rate Scenario		
	C$1 = $.75	C$1 = $.80	C$1= $.85
Sales			
(1) U.S. sales	$320.00	$320.00	$320.00
(2) Canadian sales	C$4 = $ 3.00	C$4 = $ 3.20	C$4 = $3.40
(3) Total sales in U.S.$	**$323.00**	**$323.20**	**$323.40**
Cost of Materials and Operating Expenses			
(4) U.S. cost of materials	$ 50.00	$ 50.00	$ 50.00
(5) Canadian cost of materials	C$200 = $150.00	C$200 = $160.00	C$200 = $170.00
(6) Total cost of materials in U.S. $	**$200.00**	**$210.00**	**$220.00**
(7) Operating expenses	$ 60.00	$ 60.00	$ 60.00
Interest Expenses			
(8) U.S. interest expenses	$ 3	$ 3	$ 3
(9) Canadian interest expenses	C$10 = $ 7.5	C$10 = $ 8	C$10= $ 8.50
(10) Total interest expenses in U.S. $	**$10.50**	**$11.00**	**$11.50**
Cash Flows in U.S. Dollars before Taxes	**$52.50**	**$42.20**	**$31.90**

A general conclusion from this example is that ûrms with more (less) in foreign costs than in foreign revenue will be unfavorably (favorably) affected by a stronger foreign currency. The precise anticipated impact, however, can be determined only by utilizing the procedure described here or some alternative procedure. The example is based on a one-period time

horizon. If ûrms have developed forecasts of sales, expenses, and exchange rates for several periods ahead, they can assess their economic exposure over time. Their economic exposure will be affected by any change in operating characteristics over time.

13.5.1 Using Regression Analysis to Measure Economic Exposure:

A firm's economic exposure to currency movements can also be assessed by applying regression analysis to historical cash ûow and exchange rate data as follows:

Where

PCF_t = Percentage change in inflormation-adjusted cash flows measured in the firm's home

currency over period t

e_t = Percentage change in the direct exchange rate of the currency over period t

μ_t = Random error term

α_0 = Intercept

α_1 = Slope coefûcient

The regression coefûcient, estimated by regression analysis, indicates the sensitivity of PCF t to e_t. If the coeflicient is positive and significant, this implies that a positive change in the currency's value has a favorable effect on the ûrm's cash ûows. If the coefûcient is negative and significant, this implies an inverse relationship between the change in the currency's value and the firm's cash ûows. If the ûrm anticipates no major adjustments in its operating structure, it will expect the sensitivity detected from regression analysis to be some what similar in the future.

This regression model can be revised to handle more complex situations. For example, if additional currencies are to be assessed, they can be included in the model as additional independent variables. Each currency's impact is measured by estimating its respective regression coefûcient. If an MNC is influenced by numerous currencies, it can measure the sensitivity of PCFt to an index (or composite) of currencies.

The analysis just described for a single currency can also be extended over separate sub periods, as the sensitivity of a firm's cash flows to a currency's movements may change over time. This would be indicated by a shift in the regression coefficient, which may occur if the firm's exposure to exchange rate movements changes.

Some MNCs may prefer to use their stock price as a proxy for the ûrm's value and then assess how their stock price changes in response to currency movements. Regression analysis could also be applied to this situation by replacing PCF t with the percentage change in stock price in the model speciûed here.

Regression analysis can be used for assigning stock returns as the dependent variable; regression analysis can indicate how the ûrm's value is sensitive to exchange rate ûuctuations. Some companies may assess the impact of exchange rates on particular corporate characteristics, such as earnings, exports, or sales.

Example

Toyota Motor Corp. measures the sensitivity of its exports to the yen exchange rate (relative to the U.S. dollar). Consequently, it can determine how the level of exports may change in response to potential changes in the value of the yen. This information is useful when Toyota determines its production level and manages its inventory.

13.6 TRANSLATION EXPOSURE

An MNC creates its ûnancial statements by consolidating all of its individual subsidiaries' ûnancial statements. A subsidiary's ûnancial statement is normally measured in its local currency. To be consolidated, each subsidiary's ûnancial statement must be translated into the currency of the MNC's parent. Since exchange rates change over time, the translation of the subsidiary's ûnancial statement into a different currency is affected by exchange rate movements. The exposure of the MNC's consolidated ûnancial statements to exchange rate ûuctuations is known as translation exposure. In particular, subsidiary earnings translated into the reporting currency on the consolidated income statement are subject to changing exchange rates.

To translate earnings, MNCs use a process established by the Financial Accounting Standards Board (FASB). The prevailing guidelines are set by FASB 52 for translation and by FASB 133 for valuing existing currency derivative contracts.

13.6.1 Does Translation Exposure Matter?

The relevance of translation exposure can be argued based on a cash ûow perspective or a stockprice perspective.

Cash Flow Perspective:

Translation of ûnancial statements for consolidated reporting purposes does not by itself affect an MNC's cash ûows. The subsidiary earnings do not actually have to be converted

into the parent's currency. If a subsidiary's local currency is currently weak, the earnings could be retained rather than converted and sent to the parent. The earnings could be reinvested in the subsidiary's country if feasible opportunities exist.

An MNC's parent, however, may rely on funding from periodic remittances of earnings by the subsidiary. Even if the subsidiary does not need to remit any earnings today, it will remit earnings at some point in the future. To the extent that today's spot rate serves as a forecast of the spot rate that will exist when earnings are remitted, a weak foreign currency today results in a forecast of a weak exchange rate at the time that the earnings are remitted. In this case, the expected future cash ûows are affected, so translation exposure is relevant.

Stock Price Perspective:

Many investors tend to use earnings when valuing ûrms, either by deriving estimates of expected cash ûows from previous earnings or by applying an industry price-earnings (P/E) ratio to expected annual earnings to derive a value per share of stock. Since an MNC's translation exposure affects its consolidated earnings, it can affect the MNC's valuation.

13.6.2 Determinants of Translation Exposure

Some MNCs are subject to a greater degree of translation exposure than others. An MNC's degree of translation exposure is dependent on the following:

■ The proportion of its business conducted by foreign subsidiaries

■ The locations of its foreign subsidiaries

■ The accounting methods that it uses

Proportion of Its Business Conducted by Foreign Subsidiaries:

The greater the percentage of an MNC's business conducted by its foreign subsidiaries, the larger the percentage of a given ûnancial statement item that is susceptible to translation exposure.

Example

Locus Co. and Zeuss Co. each generate about 30 percent of their sales from foreign countries. However, Locus Co. generates all of its international business by exporting, whereas Zeuss Co. has a large Mexican subsidiary that generates all of its international business. Locus Co. is not subject to translation exposure (although it is subject to economic exposure), while Zeuss has substantial translation exposure.

Locations of Foreign Subsidiaries.

The locations of the subsidiaries can also inﬂuence the degree of translation exposure because the ﬁnancial statement items of each subsidiary are typically measured by the home currency of the subsidiary's country.

Example

Zeuss Co. and Canton Co. each have one large foreign subsidiary that generates about 30 percent of their respective sales. However, Zeuss Co. is subject to a much higher degree of translation exposure because its subsidiary is based in Mexico, and the peso's value is subject to a large decline. In contrast, Canton's subsidiary is based in Canada, and the Canadian dollar is very stable against the U.S. dollar.

Accounting Methods:

An MNC's degree of translation exposure can be greatly affected by the accounting procedures it uses to translate when consolidating ﬁnancial statement data. Many of the important consolidated accounting rules for U.S.-based MNCs are based on FASB 52:

1. The functional currency of an entity is the currency of the economic environment in which the entity operates.

2. The current exchange rate as of the reporting date is used to translate the assets and liabilities of a foreign entity from its functional currency into the reporting currency.

3. The weighted average exchange rate over the relevant period is used to translate revenue, expenses, and gains and losses of a foreign entity from its functional currency into the reporting currency.

4. Translated income gains or losses due to changes in foreign currency values are not recognized in current net income but are reported as a second component of stockholder's equity; an exception to this rule is a foreign entity located in a country with high inﬂation.

5. Realized income gains or losses due to foreign currency transactions are recorded in current net income, although there are some exceptions.

Under FASB 52, consolidated earnings are sensitive to the functional currency's weighted average exchange rate.

Example

A British subsidiary of Providence, Inc., earned £10 million in year 1 and £10 million in year 2. When these earnings are consolidated along with other subsidiary earnings, they are translated into U.S. dollars at the weighted average exchange rate in that year. Assume the

weighted average exchange rate is $1.70 in year 1 and $1.50 in year 2. The translated earnings for each reporting period in U.S. dollars are determined as follows:

Reporting Period	Local Earnings of British Subsidiary	Weighted Average Exchange Rate of Pound over the Reporting Period	Translated U.S. Dollar Earnings of British Subsidiary
Year 1	£10,000,000	$1.70	$17,000,000
Year 2	£10,000,000	$1.50	$15,000,000

Notice that even though the subsidiary's earnings in pounds were the same each year, the translated consolidated dollar earnings were reduced by $2 million in year 2. The discrepancy here is due to the change in the weighted average of the British pound exchange rate. The drop in earnings is not the fault of the subsidiary but rather of the weakened British pound that makes its year 2 earnings look small (when measured in U.S. dollars).

Examples of Translation Exposure

Consolidated earnings of Black & Decker, The Coca-Cola Co., and other MNCs are very sensitive to exchange rates because more than a third of their assets and sales are overseas. Their earnings in foreign countries are reduced when translated if foreign currencies depreciate against the U.S. dollar.

In the 2000–2001 periods, the weakness of the euro caused several U.S.-based MNCs to report lower earnings than they had expected. In September 2000, when DuPont announced that its consolidated earnings would be affected by its translation exposure to the euro, investors responded quickly by dumping DuPont's shares. The stock price of DuPont declined 10 percent on that day. Other MNCs including Colgate-Palmolive, Gillette, Goodyear, and McDonald's followed with similar announcements.

In the 2002–2007 period, the euro strengthened, which had a favorable translation effect on the consolidated earnings of U.S.-based MNCs that have foreign subsidiaries in the euro zone. In some quarters over this period, more than half of the increase in reported earnings by MNCs was due to the translation effect.

13.8 NOTE

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13.8 SUMMARY

♦ MNCs with less risk can obtain funds at lower ûnancing costs. Since they may experience more volatile cash ûows because of exchange rate movements, exchange rate risk can affect their ûnancing costs. Thus, MNCs may beneût from hedging exchange rate risk.

♦ Transaction exposure is the exposure of an MNC's future cash transactions to exchange rate movements. MNCs can measure their transaction exposure by determining their future payables and receivables positions in various currencies, along with the variability levels and correlations of these currencies. From this information, they can assess how their revenue and costs may change in response to various ex- change rate scenarios.

♦ Economic exposure is any exposure of an MNC's cash ûows (direct or indirect) to exchange rate movements. MNCs can attempt to measure their economic exposure by determining the extent to which their cash ûows will be affected by their exposure to each foreign currency.

♦ Translation exposure is the exposure of an MNC's consolidated ûnancial statements to exchange rate movements. To measure translation exposure, MNCs can forecast their earnings in each foreign currency and then determine how their earnings could be affected by the potential exchange rate movements of each currency.

13.9 KEYWORDS

Exchange rate exposure: It is the sensitivity of the value of assets/liabilities/ cash flow to the change in exchange rate.

Transaction exposure: It is the exposure that results from change in value of the items whose foreign currency value is contractually fixed and these are to be liquidated in near future, affecting cash flows.

Translation exposure: It is the exposure that relates to the change in value of items in balance sheet and income statement that are denominated in foreign currency but are not to be liquidated in near future.

Economic exposure: It is the exposure that results from change in value of items whose foreign currency value is not contractually fixed but they have an effect on cash flows.

13.10 SELF-ASSESSMENT QUESTIONS

1. Given that shareholders can diversify away an individual firm's exchange rate risk by investing in a variety of firms, why are firms concerned about ex- change rate risk?

2. Bradley, Inc., considers importing its supplies from either Canada (denominated in C$) or Mexico (de- nominated in pesos) on a monthly basis. The quality is the same for both sources. Once the firm completes the agreement with a supplier, it will be obligated to continue using that supplier for at least 3 years. Based on existing exchange rates, the dollar amount to be paid (including transportation costs) will be the same. The firm has no other exposure to exchange rate movements. Given that the firm prefers to have less exchange rate risk, which alternative is preferable? Explain.

3. Assume your U.S. firm currently exports to Mexico on a monthly basis. The goods are priced in pesos. Once material is received from a source, it is quickly used to produce the product in the United States, and then the product is exported. Currently, you have no other exposure to exchange rate risk. You have a choice of purchasing the material from Canada (denominated in C$), from Mexico (de- nominated in pesos), or from within the United States (denominated in U.S. dollars). The quality and your expected cost are similar across the three sources. Which source is preferable, given that you prefer minimal exchange rate risk?

4. Using the information in the previous question, consider a proposal to price the exports to Mexico in dollars and to use the U.S. source for material. Would this proposal eliminate the exchange rate risk?

5. Assume that the dollar is expected to strengthen against the euro over the next several years. Explain how this will affect the consolidated earnings of U.S.-based MNCs with subsidiaries in Europe.

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UNIT- 14 : HEDGING STRATEGIES FOR CURRENCY RISK: CONTRACTUAL AND NON – CONTRACTUAL HEDGING

Structure:

14.0   OBJECTIVES

After going through this unit, you should be able to;

- Understand the meaning of Exchange Risk orExposure;

- Recognize the different types of Exchange Exposures;and

- Utilize the techniques of managing ExchangeExposures.

14.1   INTRODUCTION

Exchange rate risk or exchange rate exposure results from fluctuations in the exchange rate. In this unit, we have used exchange rate risk and exposure interchangeably. Currency rate fluctuations affect the value of revenues, costs, cash flows, assets and liabilities of a business organization. Transactions of business firms with foreign entities could be in the form of exports, imports, borrowing, lending, portfolio investment and direct investment etc. So a firm with any one or more types of transactions is subject to exchange rate exposure.

Firms have to become more and more careful about currency rate exposure as the process of globalization gains further momentum. Suppose US dollar depreciation against euro. This change in the exchange rate can have significant consequence both for American as well as European firms. For example, it can adversely affect the competitive position of European firms in the highly competitive US market. They will be forced to raise dollar prices of their products by more than their US competitors. The same change in exchange rate, however, will strengthen the competitive position of import-competing US firms. On the other hand, should the dollar appreciate against the euro, it would enhance the competitive position of European firms at the exposure of US firms.

Exchange rate fluctuations can affect not only firms that aredirectly engaged in international trade but also purely domestic firms. Consider, for example, an Indian leather goods manufacturer who sources only domestic materials and sells exclusively in the Indian market, with no foreign currency receivables or payables.

This seemingly purely domestic Indian firm can be subject to foreign exchange exposure if it competes against imports, say, from Chinese leather goods manufacturer. When Chinese yuan depreciates against Indian rupee, this is likely to lean to a lower rupee price of Chinese goods, increasing their sales in India, thus harming Indian manufacturer.

Exchange rate variations affect not only the operating cash flows of a firms but also home currency values of the firm's assets and liabilities. If an Indian firm has borrowed pound sterling, it can gain or loose as the pound sterling depreciates or appreciates against

the rupee. Thus, it is clear that exchange rate fluctuations can affect the value of the firm by influencing its operation cash flows as well as the domestic currency values of its assets and liabilities.

Transaction exposure arises when a firm faces contractual cash flows that are fixed in a foreign currency. For example, suppose that CHC Helicopters of St John's, Newfoundland, a world leader in supply logistics to offshore oil rigs, has billed British Petroleum (BP) for services provided to BP's sites on the North Sea. CHC's invoice is for £1 million, due in three months.1 When CHC Heli- copters receives £1 million three months from now, it will convert these British pounds into Canadian dollars at the spot rate of exchange prevailing at that time. The future spot rate cannot be known in advance. Consequently, in dollar terms, the value of the settlement is uncertain. If the British pound appreciates (depreciates) against the Cana- dian dollar, the dollar receipt will be higher (lower). The uncertain end-result suggests that if CHC Helicopter does nothing to address this uncertainty, it is effectively speculating on the future course of the exchange rate. It is as if CHC is willing to take a bet that the British pound will appreciate against the Canadian dollar. Consider another example. Say, Mitsubishi of Japan enters into a loan contract with the Swiss bank UBS that calls for payment of SF100 million for principal and interest in one year. To the extent that the yen/ Swiss franc exchange rate is uncertain, Mitsubishi does not know how much yen will be required to buy SF100 million spot in one year's time. If the yen appreciates (depreciates) against the Swiss franc, a smaller (larger) yen amount will be needed to retire the SF-denominated loan. These examples suggest that whenever a firm has foreign-currency-denominated receivables or payables, it is subject to transaction exposure, and the eventual settlements have the potential to affect the firm's cash flow position. Since modern firms are often involved in commercial and financial contracts denominated in foreign currencies, management of transaction exposure has become an important function of inter- national financial management.

14.2 DIFFERENT TYPES OF EXCHANGE RATE EXPOSURES

As already mentioned, there are three types of currency exposures which are briefly described here.

14.2.1 Transaction Exposure

This exposure arises when a company has assets and liabilities the value of which is contractually fixed in foreign currency and these items are to be liquidated in the near future. For example, the value of assets in the form of foreign currency receivables or liabilities in the form of foreign currency payables will be sensitive to the exchange rate. Likewise,

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currency rate fluctuations would impact loans, interest, dividend and royalty etc. to be paid to the foreign entities or to be received from them.

To illustrate, let us consider that a company buys raw material from abroad the contractual price of which is $100. The payment will be settled after a credit period of six months within the current financial year. Till the date of settlement, this company has a transaction exposure of $100. If dollar appreciates during six months period, the company will have to pay more in rupees than what it would have paid on the date of contract. Conversely, depreciation of dollar will result in a smaller rupee outflow. Either way, the company remains under an uncertainty as to what rupee outflow will take place on the settlement date. This uncertainty of cash flows is what constitutes the exposure/risk. Like receivables or payables, repayment of principal and interest to foreign entities due during the current financial year also gives rise to transaction exposure.

From the above description, it becomes clear that transaction exposures affect operating cash flows during the current financial year and they have short time frame. As they arise from contractually fixed items, they are also called contractual exposures. Some examples of transaction exposure could be as follows:

i)   A foreign currency receivable or payable arising out of sales or purchases of goods and services is to be liquidated in nearfuture;

ii)   A foreign currency loan or interest due thereon is to be paid or received shortly;

iii) Payment of dividend or royalty etc. is to be made or received in foreign currency.

14.2.2 *TranslationExposure*

Translation exposure arises from the variability of the value of assets and liabilities as they appear in the balance sheet and are not to be liquidated in near future. Translation of the balance sheet items from their value in foreign currency to that in domestic currency is done to consolidate the accounts of various subsidiaries. Therefore, translation exposure is also known as Consolidation Exposure or balance sheet exposure.

For the purpose of illustration, let us take an Indian parent company having a subsidiary in the USA. In the beginning of the year, the US subsidiary has capital equipment, inventory and cash valued at $200 000, $100 000 and $20 000 respectively. The exchange rate is Rs 45 per dollar. Therefore the translated value of these assets is Rs 1, 44, 00,000. At the end of the year, the assets are $210 000 (capital equipment), $105000 (inventory) and $10000 (cash) respectively. At the exchange rate of Rs 46 per dollar, the translated value becomes Rs 1, 49, 50,000. Thus, there is a translation "gain" of Rs 5, 50,000 on asset side of the balance sheet.

Likewise there must have been a translation "loss" on liabilities of the subsidiaries such as, debts denominated in dollars.

Here; it must be noted that there is no movement of cash since these assets and liabilities are not being liquidated. Simply, their value is being worked out in the currency of the parent company. Thus, translation "gains" or "losses" are notional, assuming that there is no tax implications related thereto. As a matter of fact, the main difference between transaction exposure and translation exposure is that while the former has effect on cash flows, the latter does not.

A view about translation exposure is that it is only notional in character since the translation losses or gains will differ according to the accounting practices. However, this view is not accepted unanimously. That is why an attempt is made to measure and manage it.

14.2.3 EconomicExposure

Economic exposure results from those items which have an effect on cash flows but the value of which is not contractually defined, as is the case of transaction exposure. Some examples of operating exposure are given below;

Tender submitted for a contract remains an item of operating exposure until the award of contract. Once the contract is awarded, it becomes transaction exposure.

a. A deal for buying or selling of goods is under negotiation. The price of goods being negotiated may be affected by fluctuations in the exchangerate.

b. If a part of raw material is imported, the cost of production willincrease following a depreciation of the homecurrency.

c. Interest cost on working capital requirements may increase if money supply is tightened following a depreciation of the homecurrency.

d. Domestic inflation will increase input costs of the firm even if there is nochange in the exchange rate. This will adversely affect its competitiveness vis-a-vis the firms of othercountries.

Exchange rate will affect future revenues as well as costs and hence operating profits. Since these effects are of long-term nature and impact the competitiveness of firms, operating exposure is also called **Strategic Exposure**. It influences the long- term business decisions such as products, markets, sources of supply and location of production facilities etc.

For example, continued appreciation of dollar in early eighties rendered many American firms uncompetitive vis-a-vis their competitors because the value of revenue streams denominated in foreign currencies diminished when converted into dollars. On the contrary,

in later part of eighties, many Japanese and German companies were not able to keep their operating income at satisfactory level due to fall of dollar. Some of these companies shifted their manufacturing activities in USA:

Thus we see that the operating exposure may occur when firm has direct involvement in foreign transactions as well as when it does not have a direct involvement.

Fluctuation in exchange rate has an effect on customers and suppliers as well as competitors. A firm selling only in domestic market with inputs denominated only in home currency is still exposed to competition from importing firms. An appreciation of home currency will put it at a disadvantage vis-a-vis another firm that sells imported product.

14.3 EXCHANGE RISK MANAGEMENT

The discussion so far has shown that the uncertainty of exchange rates in future gives rise to uncertainty about cash flows of a business firm. The uncertainty is nothing but exposure or risk. Consequently, firms try to minimize the uncertainty. The process to minimize or eliminate uncertainty is variously referred to as managing or covering or hedging the risk.

14.3.1 Management of TransactionExposure

The techniques used for hedging purpose can be categorized in two classes: (a) Internal techniques and (b) External techniques. These are described here under.

A)   Internal Techniques for Management of Transaction Exposure

The major techniques or methods included in this category are:

- Choice of a particular currency for invoicing receivables andpayables
- Leads andlags
- Netting
- Back-to-back creditswap
- Sharingrisk

It would be in order to say a word why these techniques are known as internal. It is because a firm does not have to take recourse to any external agency or market to apply these techniques. These are basically internal arrangements either between different subsidiaries of the same MNC or between two transacting but unrelated companies.

i.   Choice of a particular currency forinvoicing

A firm can negotiate with its counter party to receive or make payments in its own currency or another currency, which moves very closely with its own currency. For example, if an Indian company is able to invoice all its sales and purchases in rupees, then its revenues and costs will not be affected at all by currency fluctuations. Thus, its currency exposure will be totallyeliminated.

On the face of it, this is the simplest techniques to hedge exchange exposure. However, it is easier said than done. A company should be in a very strong bargaining position in order to impose the currency of its choice on its counterparts. For example, companies selling essential products like petroleum may be able to impose currency of their choice. Otherwise, for a majority of transactions, companies will have to negotiate hard to have such a choice.

In some cases, it may be possible to diversify exchange exposure by using currency basket units like SDR (special drawing rights). The SDR comprises five currencies, the US dollar, the Japanese yen, the British pound, the German mark and the French franc. The last two currencies have since ceased to be in use, after the introduction of euro. Since the SDR is a weighted portfolio of several currencies, its value is more stable than the value of any individual constituent currency.

ii. Leads and Lags

A firm will accelerate or delay receiving from or paying to foreign counter parties, depending upon what is beneficial to it. In case, home currency is expected to depreciate, a firm would like to expedite (lead) payments of the payables due. On the other hand, an exporting firm will be better off by delaying (lagging) the receipts in foreign currency. It should be kept in mind that the action of leading or lagging will not be possible without a cost for the firms desiring to do so. For example, a firm has payables of $100 due in three months. Fearing depreciation of rupee, it may renegotiate to make payment in two months.

Conversely, importing firms will delay (lag) the payment if an appreciation of home currency is anticipated and exporting firms will advance (lead) the settlement in similar situation.

For example, a firm has payables of euro 100 000 due in one month. Anticipating appreciation of rupee it delays payment to 3 months. The rates after one month and three months turn out to be Rs 56 per euro and Rs 55.50 per euro respectively. As a result, the firm stands to save Rs 500 000 [100 000 (56.00 - 55.50)] by delaying payments. Of course, it will have to negotiate with its counter party and as a result, the savings will be less than Rs 500 000. Let us suppose that the counter party agrees to delay the settlement if it is paid euro 100 750 instead of euro 100 000. So the Indian firm will effectively be paying Rs 5,591,625.

Still the firm saves Rs 8.375 (100 000 x 56 - 100 750 x 55.50).

However, it must be kept in mind that home currency may further appreciate if such actions are generalized.

iii. Netting

Normally, different affiliates of a multinational company have dealings between themselves and with their parent. For example, a subsidiary supplies semi-finished product to its parent which, in turn, sells the final product to the subsidiary. If sales value of subsidiary to the parent is $100 while that of the parent to the subsidiary is$125. Now, the total exposure of the two (parent and subsidiary) combined is $225. But this exposure can be reduced to $25 if both of them resort to what is called netting of exposures. As the name implies, netting is a technique where transacting entities try to match the maturity dates and currencies of receivables and payables between themselves. As a result, net exposures are reduced to balance amounts.

Netting can be either bilateral or multilateral. If it is done between two companies, it is called bilateral. It is called multilateral, if done between more than two transacting companies. Transacting companies may belong to the same MNC or they may be unrelated entities. However, it is easier to practice it between different companies belonging to the same MNC.

For example, Company A sells its products to company B for $100,000 and buys from B for $75 000. The movement of funds will appear as shown in the Figure 14.1
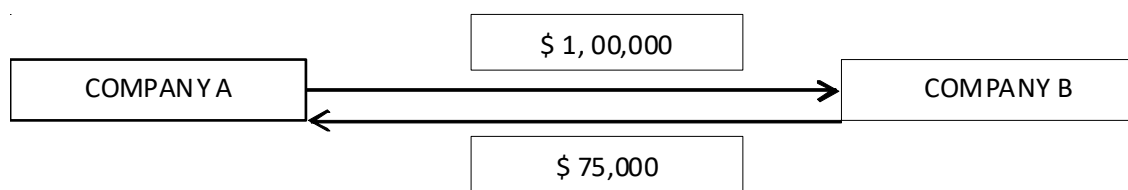
Figure 14.1 Movement of funds without Netting

The combined exposure of companies A and B is obviously $ 1, 75.000. But by netting, the net exposure is reduced to $ 25,000 as shown in figure 14.2.
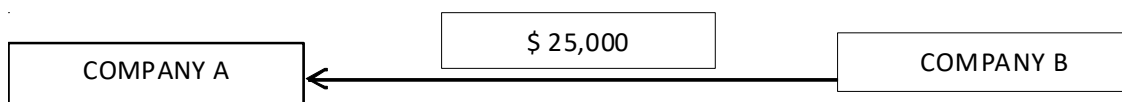
Figure 14.2 Movement of funds with Netting

iv. Back-to-Back Credit Swap

Under this method, two companies, located in two different countries, agree to exchange loans in their respective currencies. Loans are given for a pre-decided fixed period at a pre-decided exchange rate. On maturity, the sums are again re-exchanged. This arrangement can work effectively between MNCs of two different countries, each having subsidiaries in the country of the other. For example, Mitsubishi (an MNC of Japan) has a subsidiary in USA while Microsoft (an MNC of USA) has a subsidiary in Japan. The subsidiary of Mitsubishi located in USA needs to raise a dollar loan whereas the subsidiary of Microsoft located in Japan needs yen loan. Each parent company can advance loans to the subsidiary of the other in the former's home currency. This arrangement is depicted in Figure 14.3.
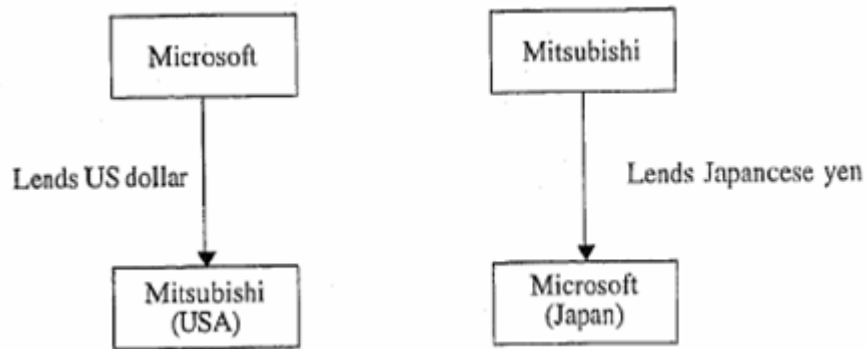
Figure 14.2 Back to Back Credit Swap

The loan amount is equivalent in the two currencies. (US dollar and Japanese yen). After the period of loans is over, the sum will again be re-exchanged. Thus, the two companies have been able to manage their exchange risk internally.

v.   SharingRisk

Any two companies from two different countries can practice this technique. The basic principle underlying this technique is that neither the benefit of the favorable movement of the exchange rate should go to one party nor the entire loss due to the unfavorable movement of the exchange rate should be borne by the other party.

For example, Airbus Industries (a French company) has sold aircrafts to a UK company. One way is to invoice the whole sales price of •10 million in euros. In this case the French company has shifted the entire exchange risk to the UK Company. Or, alternatively the sales can be invoiced as £7 million. This means that the exchange risk is now totally shifted to the French company. The third possibility is that the sales be invoiced as •5 million plus £3.5 million. This arrangement enables both the parties to share the exchange risk.

Risk sharing can take different forms. For example, the two transacting parties (business organizations located in different countries) establish a Base Exchange rate and a permissible band around this base rate, also called Neutral Zone at the time of contract. As long as the exchange rate at the time of settlement is within the permissible band/neutral zone around the base rate, settlement takes place applying the base exchange rate. However, in case, exchange rate at the time of settlement is beyond the neutral zone, then its effects on the parties are shared as per a pre- determined formula. Example 14.1 will illustrate this technique.

Example   14.1

An Indian enterprise has exported goods worth euro I million to a German company. The two companies have agreed that the base rate will be Rs 55/euro with a neutral zone of Rs 54- Rs 56 per euro. The risk resulting from fluctuations of Re/euro exchange rate will be shared between the two on 50:50 basis at the time of settlement. Find out how much will the Indian enterprise receive in rupees at the time of settlement if the spot rate happens to be.

(a)Rs52/euro, (b) Rs 54.50/ euro, (c)Rs55.75/euroand   (d) Rs 57.50/euro.

As has been agreed between the two parties, the Indian company will get Rs 55 million as long as the exchange rate at the time of settlement is between Rs 54/ euro and Rs 56/euro and the risk in terms of gains or losses will be shared between the two in case exchange rate is either below Rs 54/euro or above Rs 56/euro. Keeping this in view, the amounts received by the Indian company are worked out as given below.

(a) Exchange rate: Rs52/ euro:

Since this rate is below the neutral zone, the effective exchange rate applicable will be Rs [55 - (54 - 52) x 0.5] per euro

Or Rs 54 per euro

This means that the Indian enterprise will get Rs 54 million ratherthan Rs 55 million. The rate has moved against the Indian enterprise. If it were to be paid at the actual market rate, it would receive only Rs 52 million. However because of the risk sharing arrangement, it is able to get Rs 54 million.

The German company will pay euro 1.0384 (1 x 54/52) millionrather than euro 1 million.

(b) Exchange rate: Rs54.50 /euro:

As this rate falls within the neutral zone, the rate of Rs 55/ euro will apply. Again, since the exchange rate has moved against the Indian enterprise, it has benefited because of

the risk sharing agreement. At the market rate, it would have got only Rs 54.50 million but it has been able to get Rs 55million in this case.

The German company pays euro 1.0091 (1 x 5.5/54.50) million.

(c) Exchange rate: Rs55.75/euro:

Again the exchange rate is within neutral zone. So the Indiancompany will get Rs 55 million. This time the rate has moved in its favour. But it is not allowed to reap the full benefit of the favorable exchange rate movement. At the market rate, it would have got Rs 55.75 million but actually would get only Rs55million.

The German company has to pay only euro 0.9865 (1 x 55/55.75) million which is less than euro 1 million.

(d) Exchange rate: Rs57.50/euro:

In this case, exchange rate is beyond the neutral zone. Therefore, the effective exchange rate applicable will be

Rs [55+ (57.50 -56) x 0.5] per euro

Or, Rs 55.75 per euro.

Here the rate has moved in favour of the Indian company. Yet it is not able to reapthe full benefit of favorable movement. Instead of receiving Rs 57.50 million as per the market rate, it is getting only Rs 55.75 million.

The German company will have to pay euro 0.9695 (1 x 55.75/57.50) million instead of euro 1 million.

Thus, it is seen that in risk sharing, the effect of exchange rate fluctuations does not pass on entirely as a benefit to one enterprise or loss to another party. Instead the two enterprises, share it.

B) External Techniques for Management of TransactionExposure

The major techniques in this category are:

i)   Use of Currency ForwardMarket

ii) Use of MoneyMarket

iii) Use of Currency OptionsMarket

iv) Use of Currency FuturesMarket

These techniques are known as External Techniques simply because the various instruments that are used are external to a business organization. In order to hedge through one or more of these instruments, a company has to enter into a contractual agreement with external agencies dealing in these instruments. For this reason, they are also called Contractual Techniques.

Here we will discuss these instruments one by one considering as if at a given point of time, data relating to only one instrument is available. But in reality, a company could use one or more of them simultaneously depending upon the company's policies and choice.

I) Use of Currency ForwardMarket:

Currency Forward Market is the most frequently used market for covering the exchange risk. An organization having foreign currency receivables will sell them forward whereas the one having foreign currency payables will buy forward.

Examples 14.2 and 14.3 will illustrate this process.

Example 14.2

A French exporter has sold goods worth £l million to a British company. The receivables resulting from this transaction are due in three months. Fearing a depreciation of pound sterling, the French exporter covers his receivables in the forward market. The rates are as follows:

Spotrate: euro1.4120/£

3-m forward rate: euro1.3930/£

The value of exports on the date of transaction is euro1.41.20 million. But, naturally, the exporter is not going to receive this amount on the date of settlement as UK £ is showing tendency to depreciate. To avoid any uncertainty about the amount that the French exporter is going to get in his country's currency (i.e. euro), he sells £ 1 million forward. He waits for 3 months. On the settlement date, after three months, he receives £1 million from the British company which he surrenders to the dealer (usually a bank) with whom he had entered into the agreement for forward sale, and receives euro 1.3930 million. Thus, by covering his receivables in the forward market, the exporter has ensured that his receipts in his own currency are euro1.3930, neitherless normore.

Now, suppose he had not covered in the forward market and the spot rate on the settlement date had come down to euro 1.38/£. In that case, he would have got only euro 1.38 million. So he would have made a notional loss of euro13000 (euro 1.3930 million minus euro1.3800million).

However, there is a possibility that the UK £ appreciated instead of depreciating. Suppose the rate had become euro1.4260/£. In this situation, it would look, in retrospect, which the French exporter would have been better off if he had not covered his receivables by selling them forward. His notional loss would work out to euro 46000 (- 1.4260 million minus euro 1.3800 million) if compared with forward rate. And, his notional loss would be euro 14000 (euro1.4260 million minus euro 1.4120 million) if compared with the spot rate prevailing at the time of the export transaction.

However, it should be kept in mind that notional losses or gains are only the calculations that are done as a post-mortem exercise. The main aim of hedging or covering an exposure is not to reduce loss or increase gain. Instead it is to avoid uncertainty by selling receivables forward as the exporter knows that he would get a definite sum of euro 1.68 million.

Example 14.3

An Indian importer has bought goods worth $500,000 from an American company. The payables are due in six months. The US dollar has a tendency to appreciate. The rates available are as follows:

Spotrate: Rs44.00/$

6-mforwardrate: Rs45.50/$

The value of payables on the date of transaction between the Indian and the American company is Rs 22 million ($500,000 x Rs 44/$). But the importer will have to pay more than this amount, if US dollar appreciates during the six months that remain before settlement. By how much more? There is no answer to this question because nobody knows what spot rate will prevail at the time of settlement. To avoid this uncertainty, the importer covers his payables by buying US dollars in forward market. Once he does so, he knows the value of his payable becomes Rs 22.75 million ($500,000 x Rs45.50/$).

After the import transaction, he waits for 6 months and then he pays Rs 22.75 million to the foreign exchange dealer to receive $500,000 which he pays to the American company. By covering in the forward market, he has ensured that he has to pay neither more nor less than Rs 22.75 million.

Let us suppose the spot rate on the date of settlement turns out to be

Rs 46.00/$. It is easy to see that by buying forward, the importer has made a notional gain of Re 0.50 (40.00 - 45.50) per dollar. In other words, his total notional gain is Rs 250,000 (500,000 x 0.50). -

It is quite possible that, instead of appreciation, dollar actually depreciated to Rs 43.80/$ on the date of settlement. In that case, the importer made a notional loss of Re 0.20/ $ (Rs 44 - Rs 43.80) if compared with the spot exchange rate as it was on thedate of transaction and a much bigger loss of Rs 1.70/$ (Rs 45.50 - Rs43.80)ifcompared with the forwardrate.

But as explained in the previous example, notional gains or losses areonlypost-even exercises. The main purpose of hedging was to reduce uncertainty about theamountin rupees to be paid out for the imports. That amount is Rs 22.75 million, neither more nor less, with no uncertainty whatsoever.

II.   Use of MoneyMarket

We consider that only spot exchange rate and money market data (interest rates) are available. How does an organisation having foreign currency exposure make use of the money market data for the purpose of hedging? This is illustrated by the examples 14.4 and 14.5.

Example 8.4

We consider the same French exporter as an example 4.2 above. He has an exposure of £1 million in the form of receivables. The following money market data are given:

3 - m interest rate:

Euro:	5.5%p.a.
PoundSterling:	8%p.a.
Spotexchangerate:	euro1.4120/£

Hedging in the money market means that the exporter, by making use of the money market, should be able to know what definite amount in his own currency (i.e. euro) he is going to receive after 3 months. For this purpose, he takes following steps:

Step I: Borrow a sum of pound sterling at 8% p.a. interest for three months such that this

sum becomes £1 million along with the interest after 3 months. Say, the borrowed amount is B. Thus,B (1 + 0.08 x 3/12) = £ 1 million B = £1/1.02 = 0.98039 million

Step II: Sell this borrowed sum of pound sterling in the spot currency market at the rate of euro 1.4120/£ to get euros. The amount in euros is going to be £0.98039 x Euro 1.4120/£ million.= euro1.3843 million

Step III: Place euro 1.3843 million for 3 months in the money market at the rate of 5.5%p.a. Thus, at the end of 3 months, the amount that the French exporter will have is Euro 1.3843 x (1 + 0.055 x 3/12) million = euro 1.4033 million

Step IV: Refund the loan and interest combined that works out to be £l million as soon as this amount is received from the British company. It is clear that irrespective of the movement of the exchange rate, the exporter will have a definite amount of euro 1.4033 million. There is no uncertainty about this amount. This has been possible due to a methodical use of money market, or in other words, through hedging in money market.

Example 14.5

Taking the case of Indian importer as an example 14.3, let us see how money market data can be made use of to hedge payables of $500 000. The data are as follows:

6 - m interest rate:

US$	4.5%p.a.
Rupee:	7.5%p.a.
Spotexchangerate:	Rs44/$

The aim of the Indian importer is to know what definite amount he is going to pay in his own currency (i.e. rupee) after six months when he settles the import bill. For this purpose, he will

take the following steps:

Step I: Buy an A amount of dollars and place this amount in the money market for 6 months at the rate of 4.5% p.a. The bought amount should be such that it should become $500, 000 including interest after 6 months.

Thus,

A (1 + 0.045 x 6/12) = 500 000

A = $500,000/(1 + 0.0225) = $488997.56

In order to buy this amount of dollars in the spot market, the sum of rupees required is Rs 44 x 488997.56

= Rs 21 515892 or Rs 21.516 million.

This sum can be borrowed at the rate of 7.5% p.a. for 6 months.

Step II: The dollar amount bought from the spot exchange market is placed in the money market for 6 months. At the end of 6 months, it would become $500,000 including interest. This sum is paid to the American company on the due date of settlement.

Step III: Refund the rupee loan along with interest after six months. This works out to be

Rs 21.516 (1 +0.075x6/12)

= Rs 22.323 million

Thus, the Indian company has been able to know that it would have to pay Rs 22.323 million to clear its payables. There is no uncertainty about this sum. This has been made possible due to the methodical use of money market data.

III) Use of Currency Options Market:

Here, we are going to see how; options can be used for hedging currency exposures. The distinguishing feature of options is that they protect against the unfavorable movement of the exchange rate but allow the benefit of favorable change. Examples 14.6 and 14.7 show how payables and receivables can be hedged by using call and put options respectively.

Example 14.6

A German company has payables of $10 million due to be paid in one month. The company wants to hedge this exposure by using a call option. The data are as follows:

Spot exchange rate: $1.20/ euro

Option strike price: $1.19/euro

Maturity: One month

Option premium: 2.5

The German company will need $10 million in one month. In case, dollar appreciates against euro, the company will have to pay a greater amount in its own currency than its expectation. What is more, it does not know how much that sum is going to be onthe date of settlement after one month. It knows that the dollar has tendency to appreciate in near future. So it buys call option for the underlying dollar amount of $10 million. For this, it pays the premium upfront, which works out to be

Euro 0.025 x 10/1.20 million

= euro 0.2083 million

Then, the company waits for one month. On the maturity date, different scenarios can be envisagedas follows:

Scenario I: Dollar does appreciate against euro and the spot rate on the settlement date is $1.175/euro. So the company exercises its call option and buys required amount of dollars at the rate of $1.19/euro. Thus the total sum paid by the company is

Euro 10/1.19 + Premium already paid

= euro 8.4033 + 0.2083 million

= euro 08.6116 million

Scenario II: Dollar appreciates and the spot rate on the date of maturity is \$1.19/euro. Now whether the company exercises its option or abandons it, it will have to pay in any case at the rate of \$1.19/ euro to get required amount of dollars. So the company is said to be indifferent between exercising and abandoning its call option. In either situation, it will pay

Euro 10/1.19 + Premium already paid

= euro 8.4033 + euro 0.2083 million

= euro 8.6166 million

Scenario III: Contrary to expectation, dollar depreciates or even if it appreciates, it does not go beyond \$1.19/euro. Let the actual spot rate on the settlement date be \$1.21/ euro. In this situation, the company abandons its call option and buys required amount of dollars directly from the exchange market. The total outgo in euro works out to be

Euro 10/1.21 + Premium paid on call option

 = euro 8.2644+ 00.2083 million

= euro 8.4727 million

Thus we see the company does not have to pay more than 08.6166 irrespective of the degree of appreciation of dollar. But it benefits from the favorable movement (depreciation) of dollar. A table can be prepared to show the amount of euros to be paid by the company for various exchange rates observed on the date of settlement. See Table 14.1.

Table 14.1: Net Sum paid in euros to buy \$10 m in Example 14.6.

S. No.	Spot Rate on Maturity(ST)(\$/euro)	Call Option exercised/abandoned	Premium already paid	Net sum paid in euros (P)
1	1.15	Exercised	• 0.2083 m	• 8.6166 m
2	1.16	Exercised	•0.2083m	08.6166m
3	1.17	Exercised	• 0.2083 m	•8.6166m
4	1.18	Exercised	• 0.2083 m	• 8.6166 m
5 .	1.19	Either exercised or abandoned	• 0.2083 m	• 8.6166 m
6	1.20	Abandoned	•0.2083m	•8.54L6m
7	1.21	Abandoned	• 0.2083 m	• 8.4727 m
8	1.22	Abandoned	• 0.2083 m	• 8.4050 m
9	1.23	Abandoned	• 0.2083 m	• 8.3384 m

Profile of net payment can also be depicted graphically as in Figure 14.4

Figure 14.4 Net sum to be paid with call option

Example 14.7

A British exporter has sold goods to a US company. The receivables of $2 million are clue in 2 months. The exporter would like to hedge this exposure by using a put option. He finds out the availability of put options and chooses to buy one with the following features:

Strike price: £0.5559 /$

Maturity: 2 months

Premium: 3 per cent

The current spot rate is £0.5600/$

The British exporter will be interested in ensuring that his receivables do not lose too much value due to expected depreciation of dollar. There is no certainty how much the final amount in pound-sterling is going to be when he receives the $2 million on the settlement date. So he buys put option and pays the premium amount right away. The sum paid as premium is equal to:

£2 x 0.03 x 0.5600 million

= £0.0336million

After this the exporter waits for two months. On the maturity date, following scenarios can be visualized.

Scenario I: US dollar depreciates (as anticipated) to £ 0.50. In this situation, the exporter will exercise his put option and sell his $2 million to the writer of the option. Thus, his total inflow in pound sterling will be

£2 x 0.5.559 - Premium already paid

= £ 1. I 1 1 8 - £0.0336 million

=£1.0782million

Scenario II: US dollar depreciates to £0.5559/$ (a rare possibility) which is the same as strike price of the put option held by the hedger (exporter). In this scenario, he is indifferent between the use of his put option and its non-use. In either case, he will have the same cash inflow, that is,

 £2 x 0.5559 - Premium already paid

= £ 1 .0782 million

Scenario III: US dollar appreciates as against the anticipation. Suppose the spot rate on the settlement day is £0.5660 /$. Now the exporter abandons his put option and sells $2 million directly in the market. The total inflow in this scenario works out to be

£2 x 0.5660 - Premium already paid

 = £1.132 - £0.0336

= £1.0984 million

It is thus seen that the exporter never receives less than £1.0782 irrespective of actual spot rate on the date of settlement. His inflows are minimum at £1.0782 and he benefits from the favorable movement (appreciation) of dollar. For different possible spot rates, inflows in pound sterling are contained in Table 14.2.

Table 14.2: Net sum received by the exporter in Example 14.7

S. No.	Spot Rate on Maturity (ST)	Put options exercised/abandoned	Premium already paid	Net sum paid in pond sterling (R)
1.	£0.5300/$	Exercised	£0.0336 million	$1.0782
2.	£0.5300/$	Exercised	£0.0336million	$1.0782
3.	£0.4400/$	Exercised	£0.0336 million	$1.0782
4.	£0.5500/$	Exercised	£0.0336 million	$1.0782
5.	£0.5559/$	Either exercised or abandoned	£0.0336 million	$1.0782
6	£0.5600/$	Abandoned	£0.0336million	$1.0864
7.	£0.5700/$	Abandoned	£0.0336 million	$1.1064
8.	£0.5800/$	Abandoned	£0.0336million	$1.1264
9.	£0.5900/$	Abandoned	£0.0336 million	$1.1464

Profile of net receipt can be depicted graphically as in figure 14.5
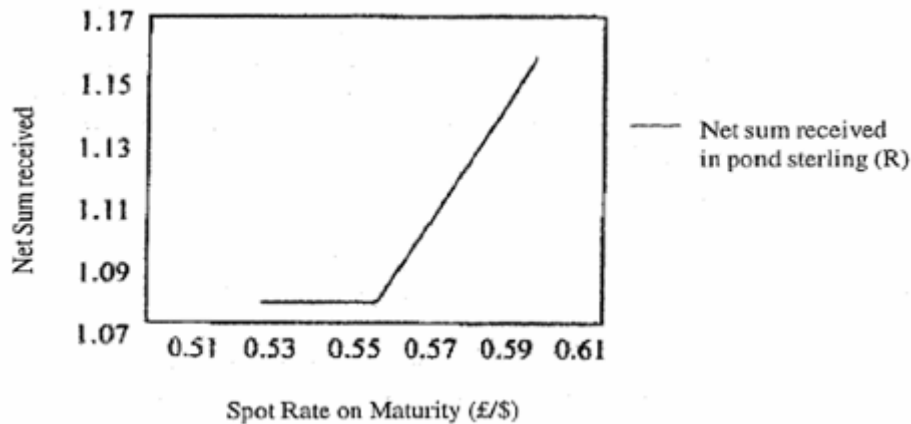
Figure 14.5Net sum to be paid with Put option

Note: Here we have learnt the use of call or put option for covering payables and receivables respectively. However, more complex methods can be used by combining options in different ways. The resultant payment/receipt will also accordingly be different.

IV) Use of Currency Futures Market

Another important derivative instrument that can be used for hedging currency exposure is Futures. Currency futures have four maturities: March, June, September and October respectively. Since these are standardised in terms of contract value,exposures (if they are not exact multiples of contract size) are either over hedged or under hedged.

For example, standard size of futures in pound sterling is £62500. The exposed amount happens to be £140,000. Now, using sterling futures, either £187 500 (£62500 x 3) can be hedged (a case of over hedging) or £1 250,000 (£62500 x 2) can be hedged (a case of under hedging) but not £140,000 as such because this amount is not an exact multiple of £62500. Normally hedged amount is more close to an exact multiple of contract size. In other words, hedge ratio should be as close to 1 as possible.

In the data given above, there are two possibilities:

Possibility I: £187,500 is hedged. In that case,

Hedge ratio =1.87, 500/ 140,000 = 1.339

Possibility II: £125 000 be hedged. In that case,

Hedge ratio = 125,000/140,000 = 0.893

It is clear that second possibility gives hedge ratio, which is more close to 1. Therefore, it would be preferred that exposure be under hedged. That is, for an exposure of £140 000, only £125 000 be hedged, leaving £15 000 un-hedged as far as the use of futures is concerned.

Now, let us look at two examples 14.8 and 14.9 to illustrate hedging through futures.

Example 14.8

An American company expects to receive euro 6 million in December from its European client. It is likely that euro would depreciate against dollar between now and settlement date. The exchange data available now are as follows:

Spot rate: $1.200/euro

December Euro futures: $1.195/euro

The American company decides to hedge its exposure in futures market. The standard size of euro futures is euro 125 000. The number of euro futures needed for hedging the exposure is:

Euro 6 000 000/ Euro 1 25 000 = 48

The number of euro futures required being an exact number, it is clear that the hedge ratio is I and the full amount of Euro 6 million can be hedged.

The American company sells 48 December euro futures by depositing guarantee margin and follows daily movement of futures. It pays variation margin whenever called upon to do so or withdraws excess amount from its margin account.

On 15 December, it decides to close the futures contract by a reverse operation. The rates on 15 December are:

Spot rate: $1.1925/ euro

Decemberfutures: $1.1890 / euro

It is clear that the American company suffered a loss on spot market as the rate has come down from $1.20/euro to $1.1925/euro. But on the future market, it makes a gain as the future which was sold at $1.195 is trading at a lower rate of $1.1890/euro.

The loss on spot market = $6 million x (1.200 - 1.1925)

 =$0.045 million

The gain on Futures = $6 million x (1.195 - 1.189)

= $0.036 million

Thus, a part of the loss suffered on spot market has been compensated by the gain on futures market. The hedge efficiency is 80 per cent (0.036/0.045).

Example 14.9

A German company has to pay SFr 200, 00 in March next. Swiss franc is likely to appreciate against euro (the German currency). The current rates are as follows:

Spot rate: SFr 1 .690/euro

March euro future: SFr1.675/euro

The German company covers its payables with March euro futures. The amount of exposure is SFr200, 000 which is equal to euro 118,343.19 (200 000/1.690) at the current exchange rate. The standard size of Euro-SFr futures is considered to be euro 125,000. So the number of euro futures needed for hedging purpose is 118343.19/125000 = 0.9467.

This number is very close to l and far above zero. Therefore, it is preferred to over hedge (hedging to the extent of euro 125 000). So one euro futures maturing in March is sold.

On the date of settlement of payables in March, the March future is closed by a reverse operation. The market rates on that date are:

Spot rate: SFr1.68/euro

March futures rate: SFr 1.668/euro

Thus, the loss on spot rate is

Euro 200,000 (1/1.68 - 1/1.69)

 = euro 119047.62 - euro 1.18343.19

 = euro 704.42

At the same time, there is a gain on futures contract. The gain works out to be

 SFr 125000 (1.675 - 1.668)

= SFr 875

At the spot rate of SFr1.68/euro, on the date of maturity the gain is euro 875/1.68 = euro 520.83

Thus, the loss on spot market has been partly compensated by gain on futures market. This compensation is to the extent of 73.93% (520.83/704.42). The compensation is not 1 00 per cent for two reasons:

i)   There is over hedging of the exposed amount since hedging has been clone to the extent of 105.62 per cent (125 000/118343.19). Hedge ratio is more than 1.

ii) The difference between spot rate and futures rate did not remain same as the time elapsed. Initially this difference was SFr 0.015/euro (SFr1.690/euro - SFr1.675/euro) while on the date of closure, it was SFrO.012/euro (SFr1.680/euro - SFr1.668/euro).

CHOOSING BETWEEN INSTRUMENTS

In choosing between these different financial techniques the firm should consider the costs and the ultimate home currency cash flows (appropriately adjusted for time value) of each method based upon the prices available to the firm. The different techniques involve different types of cash flows at different points in time and this must also be taken into account by the firm. In efficient markets, under the assumption if risk neutrality, all of these contracts should be priced so that their expected net present value is zero. In other words, contracts, such as forward and futures, that have no upfront payment will have a zero expected payoff; while options, depending on their strike price and maturity, will have an expected payoff whose discounted value is equal to the upfront premium.

There is another important distinction between the first three techniques and options for hedging exposures that the firm should consider in making its choice of hedging techniques. All of these techniques provide variance reduction to the ultimate payoff on a foreign currency denominated contract. In the case of the forward contract andthe money market hedge, the variance of the final cash flows is eliminated entirely. For most futures contracts and options, volatility still exists, but it has been substantially reduced. Options on the other hand also provide insurance to their purchaser. They provide a guarantee against losses above some preset amount, but do not lock the transaction into a fixed price, in case the price may turn out later to be wrong. Thus, one aspect of the decision of which financial instrument to use to hedge a known foreign currency transaction is whether one really desires variance reduction (say for making budgeting easier) or insurance against losses.

Transaction Hedging Under Uncertainty

Uncertainty about either the timing or the existence of an exposure does not provide a valid argument against hedging.

Uncertainty about transaction date:

Many corporate treasurers loath to commit themselves to the early protection of foreign currency cash flow. Often the reason is that, although they are sure a foreign currency transaction will occur, they are unsure as of the exact date that the transaction will occur.

These fears arising from a possible mismatch of maturities of transaction and hedge are unfounded. Through the mechanism of rolling or early unwinding, financial contracts leave open the possibility of adjusting the maturity at a later date, when more precise information is available. The resulting risk borne from the maturity mismatch is usually quite small relative to the total risk of leaving a transaction exposed until better information becomes available.

Consider the example of a French exporter who had been expecting to receive, from a foreign purchaser, a payment of $1 million at a future date t. Early on, he had hedged himself by selling forward the $1m at a forward price of $1 = FF6.200. Come date t, he is informed that his foreign customer will pay one month later at date t+1. Thus, at date t the French producer must roll over his forward contract on the basis of the then prevailing rates:

Spot rate at t (FF/$): 5.9375 / 405

One-month Franc discount 74 / 100 (Outright forward 5.9449 / 5.9505)

Below are the French exporter's transactions:

Time Transaction Exchange rate Cash Flow (FFm)

0 Forward sale of $1m to t $1 = FF6.200 0

t Roll over: 6.2000

_ spot purchase of $1m $1 = FF5.9405 -5.9405

0.2595

_ forward sale of $1m to t+1 $1 = 5.9479

(5.9405 + 0.0074)

t+1 Execute forward contract 5.9479

Notice that the rollover rate is not a regular forward rate. It is calculated by tagging the swap bid rate of 74 Franc points applying normally to the exporter's forward sale of Francs onto the current spot ask price of 5.9405. FF/$ at which he has just bought dollars. Since the rollover only requires the bank to enter a swap as opposed to a swap and a spot. On a spot purchase with a forward sale transaction, the bank does not charge a bid-ask spread for the forward round trip component.

Now the French exporter collects his Franc in two installments. Suppose he re-invests his profits on the original forward contract, FF 0.2595m for 30 days at the Franc deposit rate, which happens to be 8.25% at the time. This generates a small amount of interest equal

to FF 0.0018m. In total the exporter collects an amount equal to FF 5.9479 + 0.2595 + 0.0018 = FF 6.2092m. This can be decomposed as:

FF 6.2092 = FF 6.200 + 0.0074 + 0.0018

or, the proceeds of the original forward rate contracted at time 0 for maturity t, plus the forward premium prevailing at date t for the extra month, plus the interest on the gain from rolling over the forward contract.

While it is difficult to disentangle the interest rate risk arising from the unexpected delay of the payment which was unavoidable and the basis risk arising from hedging the wrong maturity, we can see that the risky components of the roll over return (0.0074 + 0.0018) are small in magnitude relative to the exchange rate risk that would have been borne if the transaction had not been hedged, albeit incorrectly. Thus the fact that the maturity of an identified transaction is not known is not sufficient grounds to delay the hedging of the transaction.

Uncertainty about existence of exposure:

Another form of uncertainty that arises regarding transaction exposure is in submitting bids with prices fixed in foreign currency for future contracts. If and when a bid is accepted, the firm will either pay or receive foreign currency denominated cash flows. This is a special source of exchange rate risk as it is a contingent transaction exposure. In such cases, an option is ideally suited. As mentioned above, the firm is really interested in insurance against adverse exchange rate movements between the time the bid is submitted and the time it may be accepted. Thus an option can be used to protect the value of the foreign currency cash flows associated with the bidagainst adverse currency movements. The cost of the option, which can be included in the bid, protects the value of the expected cash flows from falling below a predetermined level and represents the most the firm can lose due to currency risk. Under such a situation there are four possible outcomes: the bid is either accepted or rejected and the option is either exercised or let to expire. The following table summarizes the effective proceeds to the firm per unit of option contract (equal to the net cash flows of the project).

State	Bid Accepted	Bid Rejected
Spot price better than exercise price : let option expire	Spot Price	0
Spot price worse than exercise price: exercise option	Exercise Price	Exercise Price - Spot Price

14.3.2 Management of Translation Exposure

Before something is said about how or why to manage translation exposure, it would be appropriate to understand the four methods used for foreign currency translation. These are:

(i)   The current/noncurrent method,

(ii)   The monetary/nonmonetary method,

(iii)   The temporal method, and

(iv)   The current rate method.

Each one of the than is described hereafter:

♦   *Current/Non-current Method:* The basic principle behind the current/ noncurrent method is that assets and liabilities are translated on the basis of their maturity. Current assets and liabilities are translated at the current exchange rate. Noncurrent (long-term) assets and liabilities are translated at the historical exchange rate which prevailed at the time when they were recorded for the first time in the balance sheet. It is obvious that under this method, there will be a translation gain (loss) if the foreign currency (the currency in which the subsidiary keeps its books) appreciates (depreciates) in case the subsidiary has net positive working capital. Reverse will happen in case of net negative working capital. The reader will recall that net working capital is defined as current assets minus current liabilities.

As regards the income statement (or profit-loss account), the most items, under this method, are translated at the average exchange rate for the accounting period. Only the

revenues and expenses associated with the noncurrent assets and liabilities, such as depreciation expense, are translated at the historical rate applicable to the corresponding balance sheet item.

- **Monetary/Nonmonetary Method:** As per this method, all monetary items of balance sheet of a foreign subsidiary are translated at the current exchange rate. These terms include cash, marketable securities, accounts receivables and accounts/notes payable etc. All the nonmonetary items in the balance sheet, including equity, are translated at the historical exchange rate. The main difference between this method and current/ noncurrent method is with respect to items such as inventory, long-term debts and other long-term receivables. This method distinguishes items on the basis of similarly of attributes rather than similarity of maturity.

    The income statement items, under this method, are translated at the average exchange rate for the accounting period. The revenue and expense items associated with nonmonetary items such as cost of goods sold and depreciation are translated at the historical rates applicable to the corresponding balance sheet item.

- *Temporal Method:* Under this method, monetary accounts such as cash, receivables and payables, irrespective of their maturity (whether short-term or long-term) are translated at the current rate. Other items are translated at the current rate if their value is written in the balance sheet at current rather than historical valuation. On the other hand, if these items are carried at historical costs, they are translated at the historical rate. For example, inventory and fixed assets will have the same translated value under temporal as well as monetary/ nonmonetary method if they are recorded in the balance sheet at historical value.

    Most income statement items, under this method are translated at the average exchange rate for the accounting period. Depreciation and cost of goods sold are translated at historical rates applicable to corresponding balance sheet items if they have been carried at historical costs.

- *Current Rate Method:* This is the simplest method to use. Under this method, all items of the balance sheet are translated at the current rate except equity, which is translated at the exchange rates which existed on the dates of issuance. In this method, a Cumulative Translation Adjustment (CTA) account is created to make the balance sheet balance since translation gains/losses do not go through the income statement unlike in other three methods.

Income statement items, ender this method, are translated at the exchange rate on the dates the revenue/expense items were recognized. However, to avoid too many exchange rates, a more practical way is to use an appropriately weighted average exchange rate for the period of translation.

Application of all the four methods is illustrated through Table 14.3. The example shows the translation of the balance sheet and the income statement of an European subsidiary of US MNC. Table 14.3(a) makes use of the appreciation of euro from Euro 0.80/$ to $0.6/$ whereas Table 14.3(b) shows the translation when euro depreciates from Euro 0.8/$ to Euro 1/$.

Table 14.3(a): Effect of Translation Methods on Balance Sheet and Income Statement after Appreciation from .0.8/$ to •0.6/$. (Average rate is •0.7/$)

Item	Local Currency value of items	Value under current/non current	Value under monetary/non monetary method	Value under temporal method	Value under currentr metho
Balance Sheet					
• Cash	Euro 3300	$5500	$5500	$5500	$5500
• Inventory	2200	$3667	$2750	$4500	$3667
• (Current value=. Euro 2700)	Euro 4500	$5625	$5625	$5625	$7500
• Total assets	Euro 10000	$14792	$13875	$15625	$1666
• Current liabilities	Euro 1800	$3000	$3000	$3000	$3000
• Long-term debt	Euro 2700	$3375	$4500	$4500	$4500
• Common equity	Euro 4000	$5000	$5000	$5000	$5000
• Retained	Euro 1500	$3417	$1375	$3125	$2143
• CTA	-	-	-	-	$2024
• Total liabilities and equity	Euro I0000	$14792	$13875	$15625	$1666
Income Statement	Euro 1 5000	$21429	$21429	$21429	$2I429
• Sales revenue					
• Cost of goods	Euro 11000	$15714	$13750	$15714	$1571
• Depreciation	Euro 1500	$1875	$1875	$1875	$2143
• Net operating	Euro 2500	$3840	$5804	$3840	$3572
• Tax (40%)	Euro 1000	$1536	$2322	$1536	$1429
• Profit after tax	Euro 1500	$2304	$3482	$2304	$2143
• Foreign exchange gain(loss)	-	$1113	($21 07)	$821	-
• Net income	Euro 1500	$3417	$1375	$3125	$2143
• Dividends	-	-	-	-	-
• Retained earnings	Euro 1500	$3417	$1375	$3125	$2143

As indicated in Table 14.3(a), historical exchange rate is Euro 0.8/$. The next four columns show the translated values under all four methods after an appreciation of the euro to Euro 0.6/$. The average exchange rate for the accounting period is taken to be Euro 0.7/$. It is seen that there has been an exchange gain of $1113 under current/noncurrent method whereas there is loss of $2107 under monetary/nonmonetary method. As is expected, the situation has reversed under the scenario of euro's depreciation. There is a gain of $1550 under monetary/nonmonetary and a loss of $592 under current/ noncurrent method. Under the current rate method, there is a positive CTA of $2024 when euro appreciated and there is a negative CTA of $1167 under the scenario of depreciation,

Table 14.3(b): Effect of Translation Methods on Balance Sheet and Income Statement after Depreciation of euro from ·0.8/$ to -1/$. (Average exchange rate is euro 0.9/$)

Item	Local Currency value of items	Value under current/non current	Value under monetary/non monetary method	Value under temporal method	Value under currentr atemetho
Balance Sheet					
• Cash	Euro 3300	$3300	$3300	$3300	$3300
• Inventory	Euro 2200	$2200	$2750	$2700	$2200
• (Current value= 2700)	Euro 4500	$5625	$5625	$5625	$4500
• Totalassets	Euro 10000	$11125	$1 1675	$11625	$10000
• Currentliabilities	Euro 1800	$1800	$1800	$1800	$1800
• Long-termdebt	Euro 2700	$3375	$2700	$2700	$2700
• Commonequity	Euro 4000	$5000	$5000	$5000	$5000
• Retainedearnings	Euro1500	$950	$2175	$2125	$1667
• CTA			-	--	($1 167)
• Total liabilitiesand equity	Euro 10000	$11125	$11675	$11625	$10000
Income Statement					
• Salesrevenue	Euro 15000	$16667	$16667	$16667	$16667
• Cost of goodssold	Euro11 000	$12222	$13750	$12222	$12222
• Depreciation	Euro 1500	$1875	$1875	$1875	$1667
• Netoperating income	Euro 2500	$2570	$1042	$2570	$2778
• Tax(40%)	Euro 1000	$1028	$417	$1028	-
• Profit aftertax	Euro 1500	$1542	$625	$1542	$1667
• Foreignexchange	-				-
• (loss)		($592)	$1550	$583	$1667
• Netincome	Euro 1500	$950	$2175	$2125	
• Dividends	-	-	-	-	-
• Retainedearnings	Euro 1500	$950	$2175	$2125	$1667

Having measured possible exchange gains/losses, resulting from different methods, now the question is how to manage translation exposure. Or, is it at all worthwhile tomanage it? The translation process has no direct effect on cash flows of reporting currency (that is dollar in our above example). The realizable effect on net investment will be only upon the sale or liquidation of the assets.

It is possible to hedge losses using forward contract. For example, when euro is expected to depreciate, one can sell euro forward. Let us assume that the forward rate coinciding with the date of consolidation/translation is euro 0.98/$ and expected spot rate on the consolidation date is euro 1.00/$. If the exchange loss of $592 is to be eliminated, a forward sale of E euro will have to be done where E is given by

$$E \left(\frac{1}{forward\ rate} - \frac{1}{expected\ spot\ rate} \right) = exchange\ loss$$

$$or\ E \left(\frac{1}{0.98} - \frac{1}{1.00} \right) = 592$$

$$or\ E\ \frac{592 \times 0.98 \times 1.00}{0.02}$$

$$= \bullet 29008$$

The purchase of Euro 29008 at the expected spot rate would cost $29008 whereas the forward sale of Euro 29008 will fetch $29600, giving a net profit of $592. This eliminates totally the exchange translation loss.

However, it should be kept in mind that this hedge is based on expected spot rate and not on a definite rate. So the outcome may not be as certain as it seems. Basically, the forward position taken in euros is a speculative position. If the actual spot rate turns out to be less than Euro 1.004, then there will be a loss from the forward position.

14.3.3 Management of Economic Exposure

With the increasing pace of globalization of economy, more and more firms are subject to international competition. Volatile exchange rates can affect the firms in domestic as well as foreign markets. The value of assets/liabilities and operating cash flows can change because of the exchange rate fluctuations. Unlike transaction exposure which relates to contractually determined assets and liabilities such as receivables and payables etc., the exposure of operating cash flows depends on the effect of exchange rate changes on the firm's competitive

position. The problem is that competitive position is not readily measurable. It is quite possible that a firm's operating exposure may be much larger than contractual or transaction exposure. It is determined by the structure of the markets in which the firm sources its inputs, such as labor and material and sells its products.

Let us illustrate the importance of market structure by taking the example of an imaginary European Company, ETCL, which is a subsidiary of an Indian Company, Tata Motors. Say, ETCL imports cars from Tata Motors and sells them in European market. If the Indian currency, rupee, appreciates against the European currency, euro, the costs of ETCL go up in euro terms. Suppose, ETCL faces competitors from European can makers whose euro costs did not go up, it will not be in a position to raise the euro price of imported Tata cars lest it might lead to reduction in sales. Since the car market in Europe is highly price elastic, ETCL cannot afford to let the exchange rate charge pass through the euro price. As a consequence, an appreciation of rupee will reduce the profit of ETCL. This means that the parent company, Tata Motors, is subjected to a high degree of operating exposure.

As opposed to this scenario, it is possible to consider the case where ETCL faces import competitors only from other Indian car makers such as Maruti and others and not from local manufacturers. Since euro costs of other importers will be affected by the rupee appreciation in the similar manner, the competitive strength of ETCL remains intact or is marginally affected. In this kind of market structure, rupee appreciation will be reflected in higher euro price of the cars imported from India. As this happens, Tata Motors will be able to maintain its rupee profits, with minimal operating exposure.

In practice, exchange rate change is almost never fully absorbed through price adjustments of goods. One alternative is to pass the cost shock fully to selling price (complete pass-through) and the other is to fully absorb the shock (zero pass- through). However, firms often do resort to partial pass-through.

But price adjustment can, at best, be a short-term measure to manage economic exposure. Since a firm is exposed to exchange risk mainly through the effect of exchange rate changes on its competitive strength, exposure management is to be seen in terms of the firm's long-term strategic planning. Managing operating exposure cannot be a short-term tactical issue. It is to be considered in a longer perspective.

The measure could be such as

(i)   Selecting low-cost production location,

(ii)   Adopting flexible sourcing policy,

(iii) Diversifying the market,

(iv)   Making R&D effort for product differentiation and

(v)   Hedging through financial products.

We discuss these one-by-ones.

Selecting low-cost production location:

In case domestic currency is already strong or is expected to become stronger in near future, it will have an effect of reducing competitive position of the firm. In such a situation, it can choose to set up its production facilities in a foreign country where costs are lower. Lower cost can be due to lower price of factors of production such as land and/or labour or depreciating currency of that country. In our example of the hypothetical company, ETCL, a possible action by Tata Motors could be to shift the production facilities to an European location to avoid the negative impact of appreciating rupee on operating cash flows. The other possibility is that instead of locating the production at one single place, it can be done at several places in different countries. Such a decision will provide the firm a great deal of flexibility. It can choose to produce where it is most advantageous to do so, keeping the exchange rates in view. There are, however, disadvantages associated with the decision of multiple locations. The firm may have to forego the advantage of economies of scale. So, a trade-off between flexibility of shifting production and economies of scale has to be found.

Examples of shifting production facilities are provided by some of the Japanese and German companies. In the recent past, Daimler Benz and BMW of Germany and, Nissan and Toyota of Japan decided to establish production facilities in USA after German and Japanese currencies appreciated against US dollar.

Adopting flexible sourcing policy:

Another way of reducing the economic exposure is to buy inputs from where they have lower cost. Sourcing from low cost countries is not limited to raw material or accessories but, also, the firms can hire low cost manpower from abroad. In the past, Japan Airlines did hire foreign employees to maintain their competitiveness in aviation industry. Likewise, many Japanese companies depended heavily on low cost countries like Thailand, Malaysia, Philippines and China etc to buy inputs such as spare parts and intermediate products.

Diversifying the markets:

Diversification of the market of the firm's product will reduce its economic exposure. Suppose Tata Motors sells its cars in Europe as well as in China. Also, suppose rupee appreciates against the European currency, euro, and depreciates against the Chinese currency yuan. The effect of these developments will be opposed to each other. While the sales of Tata cars will reduce in the European market, they are likely to increase in the Chinese market. So reduction in the European market is offset by the increase in the Chinese market. As a result, the cash flows of Tata Motors will be much more stable than they would be if it sold its cars only in one of the two markets. Of course, this strategy cannot work if all the rates moved in the same direction. Normally, that does not happen. Hence, diversified market does help in reducing economic exposure.

Making R&D effort for product differentiation:

R&D activity aims at strengthening competitive position of a firm against the adverse effect of exchange rate changes. R&D can bring about gains in productivity, reduction in costs and, most importantly, differentiation in products that the firm offers. New or differentiated products have inelastic demand. That is, their demand is not or less sensitive to price variations. Price inelasticity would make the firm immune to economic exposure.

Hedging through financial products:

Though various ways outlined above will be necessary for effective management of economic exposure, financial products should be used as supplements as far as possible. The firm can use forward, futures or option contracts. These contracts can be rolled over several times, if the situation so demands. Also, the firm can borrow and/or lend foreign currencies on long-term basis.

14.4 NOTES

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14.5 SUMMARY

Exchange rate risk or exposure results from the fluctuation in the exchange rate between pair of currencies. Exchange exposure is classified in three categories, namely, Transaction exposure, Translation exposure and Economic (or operating) exposure.

Transaction exposure arises because of the assets or liabilities whose value is contractually fixed in a foreign currency and these assets or liabilities are to be liquidated in the near future. This type of exposure affects cash flows.

Translation exposure results from the variability in the value of assets/liabilities contained in the balance sheet and denominated in foreign currency. This type of exposure does not have effect on cash flows.

Economic exposure results from those items that have effect on cash flows but whose value is not contractually fixed.

The terms 'Managing' or 'Covering' or 'Hedging' exchange risk are used synonymously. Exchange rate risk management techniques can be divided in two categories, namely, Internal and External. One of the simplest ways to manage exchange risk is to invoice all transactions in home currency. Though simple, it is difficult to get counter party agree to it. If home currency is likely to appreciate, it will be beneficial to delay the settlement of payables and expedite the settlement of receivables.

Netting between the payments flows between two companies is known as Bilateral Netting. Under the Back-to-Back Credit Swap technique, two companies located in two different countries agree to exchange equivalent loans in their respective currencies at a pre-fixed exchange rate. Two transacting parties share risk by establishing a base rate and a neutral zone around the base rate. If the exchange rate moves beyond the neutral zone, the risk is shared between the two parties.

Hedging exchange risk in forward market involves selling receivables forward and buying payables forward. Hedging exchange risk in the money market means using interest rates rationally so as to fix in advance the value of receivables and payables in home currency.

Currency options can be used for managing exchange risk. Normally, call option is used to hedge payables while put option is used to hedge receivables. Use of call option limits the value of payments to be made to settle foreign currency payables while it allows the benefit of lower exchange rate (i.e. depreciation of foreign currency). Use of put option ensures a certain minimum value of receivables while it allows the benefit of higher exchange rate (i.e. appreciation of foreign currency).

Like forwards, futures can be used for hedging exchange risk. It is advisable that hedging ratio be as close to 1 as possible. Since exposed amounts may not always be exact multiples of futures contract size, often under hedging or over hedging is done while using futures.

Translation of balance sheet and income statement items is done in order to work out translation gains/losses. Four methods of translation are in use: (i) current/noncurrent method, (ii) monetary/nonmonetary method, (iii) temporal method and (iv) current method. There is no definite view on whether translation exposure should be managed or not since it does not affect cash flows of the firm. Translation exposure can be managed by taking a position on forward market.

Economic exposure has effect on operating cash flows. But it is difficult to measure unlike transaction exposure. Economic exposure can be managed by taking long-term measures such as (i) selecting low-cost production location, (ii) adopting flexible sourcing policy, (iii) diversifying the market, and (iv) using R&D for product differentiation etc. These measures can be supplemented with financial hedging products, as far as possible.

14.6 KEYWORDS

Exchange rate exposure:

It is the sensitivity of the value of assets/liabilities/ cash flow to the change in exchange rate.

Transaction exposure:

It is the exposure that results from change in value of the items whose foreign currency value is contractually fixed and these are to be liquidated in near future, affecting cash flows.

Translation exposure:

It is the exposure that relates to the change in value of items in balance sheet and income statement that are denominated in foreign currency but are not to be liquidated in near future.

Economic exposure:

It is the exposure that results from change in value of items whose foreign currency value is not contractually fixed but they have an effect on cash flows.

14.7 SELF-ASSESSMENT QUESTIONS

1) Describe different types of exchange exposures.

2) Explain with examples the techniques of netting.

3) Explain the technique of risk sharing.

4) An Indian company has receivables of Y100 million. The base rate is decided to be Re 0.37A with a neutral zone between Re. 0.36 and Re 0.38 per yen. Calculate the rupees amount that the Indian company will get if the rates are as follows at the time of settlement:

   (a) Re 0.34/¥, (b) Rs 0.365/¥ and (c) Re 0.40/¥.

   (b) The risk is shared on 50:50 basis between the two parties

5) Read the following data: Receivables due in 3 months: Euro l million

   Spot rate: Rs 55/Euro

   3-m forward rate: Rs 54.50/Euro

   What do you suggest and why as regards hedging of these receivables.

6) Describe the process of hedging with the following data:

   Payables clue in 6-months: $600,000

   Spot rate: Rs 44/$

   6-mn interest rates:

   Rupee: 7% p.a.

   Dollar: 5% p.a.

7) The standard size of euro futures is Euro125, 000. For payables of Euro 900,000 due in March, discuss the process of hedging with futures. Other data are as follows:

January

Spot rate: $1.190/Euro

March euro futures rate: $1.120/Euro

March

Spot rate: $1.198/Euro

March euro futures rate: $1.1.25/Euro

8) An importer is to pay $2 million to a US company after 2 months. To hedge his exposure, he buys an option by paying 2 per cent premium. The spot rate is Rs 44/$ while the strike price of the option is Rs 45/$.

Which option has the importer bought? How is he going to use this option? Explain.

9) List and describe various methods of translating balance sheet and income statement items from the currency of the subsidiary to that of the parent.

10) Take an example of your choice to show the use of each of the translation methods.

11) Suggest some ways of managing economic exposure.

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UNIT-15 : FORWARDS, FUTURES, SWAPS AND MONEY MARKET OPERATIONS

Structure :

15.0 OBJECTIVES

After studying this unit, you should be able to;

- Understand how derivatives serve as financial instruments;

- Understand the meaning and use of currency futures, currency options, and currency swaps.

15.1 INTRODUCTION

Derivative is an instrument that derives its value from another underlying asset or rate. Without the underlying asset, a derivative would have no independent existence or value. Derivative product is created by the introduction of a new security having a relationship with the underlying cash or spot market. The common derivatives are Futures, Options and Swaps.

A typical financial transaction is marked by several risks. Derivatives allow us to manage these risks more efficiently by unbundling these risks and allowing either hedging or taking only one risk at a time. And therefore derivatives have become increasingly important in the field of finance.Derivatives permit the separation of price risks and redistribution to others who can manage them. Derivatives traded on organized exchanges provide liquidity and quick adaptability ofexposure to market changes.

Derivatives can be used for hedging, protecting against financial risk, or can be used to speculate on the movement of commodity or security prices, interest rates or the levels of financial indices.

Options and futures are traded actively on many exchanges. Forward contract, swaps and different types of options are regularly traded outside exchanges by financial institutions,banks and their corporate clients in what are termed as over-the-counter markets—in otherwords, there is no single market place or an organized exchange. Derivatives are available on many aggregate economic risk factors such as global bond and stock portfolios. With many futures contracts, global risk positions and portfolios can be traded as a single financial product. While, for example, it is difficult to trade baskets of securities at stock exchanges, stock index options and futures offer opportunities to trade aggregate stock market risks for as much as 1/10 or 1/20 of the costs of an equivalent cash market transaction! Derivatives also facilitate diversification because; given that the investment represents only a fraction of the cashinstrument (leverage) it is easier to diversify a given amount of capital across several assets.Finally,

if more risks can be diversified, the systematic risk exposure of the economy decreaseswhich lowers the overall cost of risk capital for firms.

A Futures Contract is an agreement to make or take delivery of a specified quantity at an agreed price on a future date in the underlying market. Futures contracts exist in commodities, equities, equity indices, interest rates and currencies. We will discuss specifically currency futures.

An Option is a right but not an obligation to make or take delivery of a specified quantity of an underlying asset at an agreed price on a future date. Option contracts also exist, just like future contracts, on different underlying assets or rates such as equities, currencies and interest rates etc. We will discuss currency options in this unit.

A Swap contract represents an exchange of two streams of payments between two parties.

The three derivatives instruments are discussed in this module in sufficient detail.

It is worth noting here that derivative instruments are very important risk-management tools. However, they are widely used for speculative purposes as well. And, if not used with caution, they can turn out to be very risky investments. It will suffice here to highlight this aspect through the story of what happened to Barings PLC, the oldest merchant bank of the UK. The bank was placed under "administration" by the Bank of England (the Central Bank of UK) in February 1995. This happened because of the losses that the Barings PLC accumulated through speculation on derivatives exceeded its entire equity capital of $860 million. One single trader took positions on behalf of the bank in expectation of making huge profits. These positions, taken primarily on the Nikkei 225 stock index futures being traded on Singapore International Monetary Exchange (SIMEX), were more than $25 billion when the market moved against the trader's speculative expectation. As a result, Barings collapsed and was taken over by the Dutch banking and insurance company, ING Group. And, the trader was prosecuted for fraudulent trading.

There are other equally frightening stories associated with derivative trading. Nevertheless, if used with due care and caution, they serve a useful purpose of risk management and price discovery.

15.2 FORWARDS

A forward contract is an agreement between two persons for the purchase and sale of a commodity or financial asset at a specified price to be delivered at a specified future date.An agreement to purchase one currency and sell another for some date beyond two business days. A forward involves no fee, and no cash changes hands until the settlement date of the forward. A forward allows one to lock in an exchange rate today for a future payment orreceipt, thereby eliminating rate risk.

Forward contracts are tailor made to the needs of the parties who may be banks in case offinancial assets and trader or processor in case of commodities. Forward markets have flourished as a means to reduce price uncertainty.

The advantages of forward contract:

- It can be used to hedge or protect oneself form the price fluctuations on the future commitment date to extent of 100%

- The up - front fees or margins are not applicable to forward contracts and hence noinitial costs.

Disadvantages:

- Forward contracts are not performance guaranteed. Hence involve counter party risk.

- The investor cannot derive any gain from favorable price movements either before or on delivery date.

- Forward contracts are not traded in the secondary market, hence there is no ready liquidity.

- Banks being one of the counter parties enter into reverse transactions to square positions and hence charge huge bid-ask spread.

A forward contract locks one investor to a particular exchange rate, thereby insulating him or her from exchange rate fluctuations. In India, the forward contract has been the most popular instrument employed by corporate to cover their exposures, and, thereby, offset a known future cash outflow. Forward contracts are usually available only for periods up to12 months. Forward premiums are governed purely by demand and supply, which provide corporate with arbitrage opportunities. The premiums in this market are quoted till the last working day of the month.

Internationally, the forward premiums, or discounts, reflect the prevailing interest ratedifferentials. Arbitrage opportunities are, therefore, limited. As a rule, a currency with a higher interest rate trades at a discount to a currency with a lower interest rate. Since thereis a forward market available for longer periods, the forward cover for foreign exchange exposures can stretch up to five years. The premiums, or discounts, are quoted on a month -to-month basis. That is, from the spot date to exactly one month, or two months, or even a Forward-to-forward contracts

A forward-to-forward contract is a swap transaction that involves the simultaneous sale and purchase of one currency for another, where both transactions are forward contracts. It allows the company to take advantage of the forward premium without locking on to thespot rate. The spot rate has to be locked onto before the starting date of the forward - to – forward contract.

A forward-to-forward contract is a perfect tool for corporate houses that want to takeadvantage of the opposite movements in the spot and forward market by locking in the forward premium at a high or low level now. CFO's can defer locking on the spot rate to the future when they consider the spot rate to be moving in their favour. However, a forward to forward contract can have serious cash flows implications for a corporate. Before booking a forward-to-forward contract, CFO should carefully examine his cash flow position bearing in mind the immediate loss that he would make if the spot rate did not move in his favour.

Example

An exporter believes that forward premiums are high, and will move down before the end of, say, December 2000. Also he expects the spot rate to depreciate. Then the optimal strategy would be to lock in the high premium now, and defer the spot rate to a future date. So heopts for a forward-to-forward contract for end-December, 2000, to end-March, 2001, payinga premium of say, Rs.0.64. By entering into such a contract, the exporter has the opportunityto lock on the spot rate anytime till December 31, 2000. Alternatively, if the three-monthpremium between end-December and end-March moves below the Rs.0.64 level, he cancancel the contract and book his profits.

Range-forwards

A range-forward involves the simultaneous purchase and sale of an option at different strike prices, but having the same maturity date and the same principal amount.While an option provides a corporate the flexibility to benefit from upside movements while limiting downside risks, it has an associated cost; a high upfront

premium. By setting a ceilingon the potential gains, a range-forward trades off some of the upside for a lower premium.

Example

Company X is importing machinery worth DM 1 million. Although the Chief Finance Officer(CFO) wants to insure against downside losses, he finds the option premiums are exorbitant.In exchange for a lower premium, say 0.5%, he is willing to give up some of the upside gainsif the DM moves above 1.7600. So, he buys a range-forward, which limits the fluctuation ofthe DM to a band between 1.7600 and 1.7200.

The regulation:

In September, 1996, the RBI's exchange Control Manual was amended to allow the banks to offer range-forwards to corporate to hedge their foreign exchange exposures, provided the net premium paid by the corporate was non-negative. This implies that a corporate cannot buy a range-forward which would result in a cash inflow by way of premium. The best thata corporate can do in such a situation is to opt for a zero-cost range-forward.

Ratio range-forwards

A ratio range-forward is an improved version of the basic range forward. The difference is that the principal amounts on the two options differ. The buyer gets full protection on the downside but shares the profit with the writer in a predeter mined ratio if the currency moves above a specified level.

In the case of a range-forward, the buyer sacrifices the benefit of favorable movements in the currency beyond a predetermined level for a lower premium. However, with the ratiorange-forward, the buyer shares the profit in a predetermined ratio if the currency moves above a predetermined ceiling. As this is an additional benefit, the ratio range-forward is more expensive.

If we consider the case of a CFO who would like to restrict his down side to DM 1.7200 to thedollar, however, he does not want to rule out the possibility of a strong dollar appreciation.The ideal instrument would be a ratio range-forward, which allows the CFO to have a specified share say, 30% in the gains if the DM crosses the 1.7600 mark. The Regulation: These derivative products can be freely booked and cancelled. However, the restriction barring thenet inflows of premium to corporate still applies.

Terms and conditions applicable to forward contracts in India

In March, 1992, in order to provide operational freedom to corporate, the unrestricted booking and cancellation of forward contracts for all genuine exposures whether trade related or not, was permitted.

In February 1992, corporate with cross currency exposures were permitted to split their cover through the dollar. For instance if an importer with a DM 1-million payment to make on March 31st 1998, is of the view that the rupee will depreciate against the dollar, but that the dollar will appreciate against the deutsche mark, he can split his exposure into a $-DMleg and a $-Re leg-and hedge the latter. The Reserve Bank of India (RBI) has also permitted corporate to take cover in a currency of their choice irrespective of the currency receivable orpayable.

In January 1997, the RBI allowed the banks to quote rupee forward premiums for more than six months. This has resulted in the development of a local forward market for up to 1-year.However, as the link between the local money market and the foreign exchange markets is not strong, and as demand and supply determine prices, activity in the long-term forward market has been limited. In short the salient features of regulations may be enumerated as:

1. They are available for exposures arising out of genuine export / import transactions.

2. They can be entered between authorized dealers and any entity which is a resident ofIndia, at the time of the contract.

3. The authorized dealer must ensure that the investor is exposed to exchange rate risk.

4. They must be in writing, in a prescribed form.

5. The exchange broker cannot act as an authorized dealer.

6. Maximum tenure of forward contract is 6 months and can be extended to another 6 months if the need arises.

7. Forward cover in respect of one commercial transaction cannot be extended to anyother foreign exchange commitment or risk.

8. Forward contracts can be cancelled for a fee.

15.3 FUTURES

A futures contract is an agreement between a seller and a buyer which requires the seller to deliver to the buyer a specified quantity of security, commodity or foreign exchange at afixed time in future at a price agreed to at the time of entering the contract. Futures contracts are traded in designed futures market unlike forward contracts that are executed over thecounter. The terms of the future contracts are standardized to reduce the transaction cost to the bare minimum.

The oldest futures exchange is the Chicago Board of Trade in USA. The CBOT was limited toagricultural futures for the last 100 years. With the increased volatility in the financial markets,CBOT, along with other futures exchanges has started creating markets in financialfutures.

Why futures?

Futures contracts are bought and sold for many reasons. Individuals deal in futures contracts to speculate about the future price of the asset or commodity underlying the futures contract.Corporates enter into futures contract to eliminate the risk exposure occurring due to changesin the price of the commodity. Fund managers use futures as a more economical way of achieving their portfolio goals.

Speculators deal in futures contracts to benefit from the rice fluctuations in the underlying asset or commodity, while hedgers seek to protect themselves against price changes incommodities in which they have an interest.

Characteristics of futures:

♦ **Organized exchanges:**

Futures contracts are traded in organized exchanges with a designated physical location for futures trading. This provides instant liquidity as futures contracts can be sold and bought anytime like in a stock market.

♦ **Standardization:**

The futures contracts are standardized in the sense that the price,the quantity and the date of maturity is fixed by the exchange in which they are traded.

♦ **Clearinghouse:**

The clearing house acts as a middleman between the contracting parties. As soon as the deal is struck between X and Y, two contracts are entered into, one between X and the Clearing house and the other between Y and the Clearing house. The clearing house

acts as a buyer for every seller and seller for every buyer. It guarantees the performance of the contracts.

- ♦ **Margins:**

Only members of the respective exchanges can enter into futures contracts.They are required to deposit margin money with the clearinghouse. The amount of this margin money is generally between 2.5% to 10% of the value of the contract, but canvary.

- ♦ **Marking to market:**

At the end of each trading session, all outstanding contracts are appraised at the settlement price of that trading session. This is known as Marking tomarket. This would mean that some participants would make a loss while others would stand to gain. The exchange adjusts this by debiting the margin accounts of those members who made a loss and crediting the accounts of those members who have gained.

- ♦ **Actual delivery is rare:**

In most futures markets, actual delivery takes place in less than one percent of the contracts traded. Futures are used as a device to hedge against price risk and as a way of betting against price movements rather than a means of physical acquisition of the underlying asset. To achieve this, most of the contracts entered into are nullified by a matching contract in the opposite direction before the maturity of the first.

Example:

A fast food seller like Monginis will need to buy additional wheat from his supplier in three months. However, he feels that the price of wheat is going to increase by the time heneeds the wheat in three months. May be he feels this year the monsoon will not set in ontime. Because of fierce competition, he needs to hold his price constant. He wants to makesure that he pays Rs. 355 per quintal. Therefore, to lock in the Rs. 355 per quintal price, he buys a contract for three months out at Rs. 355 per quintal. If three months later the price of wheat has risen to Rs. 369 per quintal, he will pay his supplier Rs. 369. However, the Rs. 14increase has been offset by the Rs. 14 increase in his futures contract.

On the other hand, if the price of wheat declines by an amount of Rs.10 per quintal toRs. 345 per quintal, the decline in the futures contract will be offset by the lesser amount the manufacturer has to pay his supplier. Irrespective of what happens in the spot market, the manufacturer has locked in a set price for the wheat he needs to purchase in the future.

Types of Futures:

Futures may be broadly classified into Commodity and Financial Futures. A commodity is a futures contract in a commodity like tea, coffee, cocoa, aluminum etc. A financial future is afutures contract in a financial instrument like Treasury bill, currency or stock index.

1.   Commodity futures

♦   Agricultural: This includes tea, coffee, wheat, spices, rice, sugar etc. For each of these commodities there are different contract months available. Contract monthsgenerally revolve around the harvest cycle. More actively traded commodities usually have more contract months available.

♦   Metallurgical: The group of metallurgical commodities includes the metals andthe petroleum. The metals group includes gold, silver, copper, palladium and propane. Different contract months, grades, amounts, and types of these contracts are available.

2. Financial futures

♦   Interest Bearing Assets: This group of futures contracts includes Treasury Bills,TreasuryBonds, Treasury Notes, Municipal Bonds, and Eurodollar Deposits. The entire yield curve is represented and it is possible to trade these instruments with tremendous flexibility as to maturity. In fact, it is also possible to trade contracts with the same maturity but different expected interest rate differentials. In addition, foreign exchanges also trade debt instruments.

♦   Indexes: Today, there are futures on most major indexes. The National Stock Exchange, BSE Sensex (of Mumbai Stock Exchange) of India, S&P 500, New YorkStock Exchange Composite, New York Stock Exchange Utilities Index, Commodities Research Bureau (CRB), Russell 2000, S&P 400 Midcap, Value Line, and the FT-Se 100 Index (London), Stock index futures are settled in cash. There is no actual delivery of a good. The only possibility for the trader to settle his positions is to buy or sell an off setting position or in cash at expiration. Recently the National Stock Exchange has launched derivative futures called S&P CNX Nifty.

An Index future is a future where the underlying asset is a stock index. The NSE stockindex (CNX Nifty) has been launched on 12th June 2000. It has been observed that investors like to hedge their entire share portfolio and not just one or two stocks. A portfolio of 10 to 15 stocks tends to have a strong correlation with the indices. Indexfutures may be

- Value weighted index (consists of each stock of the index value in proportion to themarket value of the outstanding shares) Ex: S&P 500, NYSE.

- Price weighted index (is the one that gives a weight to each stock that is proportional to its stock price) Ex: NIKKEI

In value-weighted index, all blue chips with heavy market capitalization have more weightagewhereas in price-weighted index, small equity company can also have major weights based on its price.

Trading and Settlement

Index futures are also standardized like all futures. The size and the tenure need to be understood. The size represents the minimum quantity of the index that is bought or sold;trading lots are in multiples of this number. The tenure is the minimum duration for which afutures contract can remain open. At the end of the period both the parties to the contract necessarily settle. Settlement is in cash and obviously the seller of the index future does notdeliver the underlying securities of an index.

Index Futures and SEBI

SEBI has specified the minimum size of 2 lakh and a maximum tenure of three months.Given the current Nifty and Sensex levels, futures contracts based on these will have aminimum market lot of 150 and 50.

Advantage

Index futures help an investor to take a position on the market and also hedge the share portfolio against adverse market conditions. One can get out of the futures position any time before thecontract expires by entering into a reverse contract.

How does it work?

An Index future is essentially a forward contract and hence requires payment of an initial amount called up front or initial margin of the value of the contract ranging from 6 to 10percent. They are marked to market daily i.e. profits and losses are received and paid out bythe contracting parties every day.

Example

If an investor is optimistic that the Nifty would rise in future and buys, say 100Nifty futures paying an initial margin of say, 8%. At the time he sells, he gains if the Niftyrises. The profit being the difference between the selling price and the buying price (margin)multiplied by the number of futures purchased.

Foreign Currencies: In the 1970s when freely floating exchange rates were established it became possible to trade foreign currencies. Most major foreign currencies are traded. The principal currencies traded are the Canadian dollar, Japanese yen, British pound, Swiss franc,French franc, Eurodollar, Euro mark, and the Deutsch mark. The forward market in currenciesis much larger than the foreign exchange futures market. Additionally, there are now cross currency futures those trades. Examples of these are the Deutsch mark / French franc andthe Deutsch mark / yen. Almost every month a new type of contract appears to meet the needs of a continuously growing corporate and institutional market.

15.4 CURRENCY FUTURES

A Currency Futures Contract is a commitment to either take delivery or give delivery of a certain amount of a foreign currency on a future date at a specified exchange rate. Currency futures are conceptually similar to currency forward contracts. But they differ widely in terms of operational process.

For example, A needs 1000 euros on a date sometime in near future. So, instead of buying this amount now and keeping it idle, A buys a futures contract maturing around the date when he needs 1000 euros. Suppose this particular futures contract is quoting at Rs 56 per euro today. Once A enters into a contract to buy 1000 euros at Rs 56 per euro, he will have to pay neither more nor less than Rs 56 per euro irrespective of the actual spot rate on the date of delivery of the 1000 euros.

The participants on currency futures market may be traders, brokers or brokers-traders. Traders are speculators who buy and sell to take positions on the market for their own account. Brokers do not trade but enable other clients to find buyers/sellers. They do so by charging a commission. Broker-traders operate for their own account as well as for their clients. Business enterprises, operating through their brokers, buy or sell currency futures in order to cover or hedge their currency exposures. They are called hedgers for this reason. On the other hand, speculators take positions in futures market to make profits.

15.4.1 Features of Currency Futures

As mentioned above, currency futures are conceptually similar to currency forwards. Yet, they are different in terms of their dealing. Following are the characteristic features of the currency futures that distinguish them from forward contracts:

a. Standardisation,

b. Organised exchanges,

c. Clearing house,

d. Initial and maintenance margin, and

e. Marking-to-market process.

Currency futures are standardised in terms of contract size, maturity date and minimum variation in their value. Standardization of size means that a certain minimum amount would constitute one futures contract in a particular currency. For example, a pound sterling future has a size of £62500 on Chicago Mercantile Exchange (CME). This means that one can buy or sell pound sterling futures only as multiples of £62500. If an enterprise needs to buy £300000, it has to enter into a futures contract either to buy £250000 (4 contracts of £62500 each) or buy £312500 (5 contracts). While buying or selling futures for hedging purpose an enterprisenormally either under-hedges or over-hedges since the hedged amount is rarely an exact multiple of standard contract size

The feature of standardization is maturity dates. On Chicago Mercantile Exchange (CME), most of the currency futures contracts mature on third Wednesdays of March, June, September and December. Normally, futures contracts carry a prefix by name of the month of their maturity, For example, we say a March yen futures or a March euro futures or a June sterling futures etc. A March yen futures simply means that the futures contract on the currency, yen, will mature in the month of March and a June sterling futures will mature in the month of June.

Generally, futures contracts are closed through reverse operations. That is, sellers buy back orbuyers sell back their contracts. In case, the contacts remain open upto the maturity date, theyare closed on that day.

The third aspect of standardization relates to minimum variation, also called "tick". Variations in dollar prices of future contracts cannot be random; they are multiples of a certain minimum value.

For example, this minimum variation for pound sterling is US$0.0002/£. In other words, the value of pound sterling futures can vary only in terms of $12.50 (0.0002 x 62500). So the value of one tick is $12.50, suppose, at any time, a pound sterling futures is quoting at US$1, 7940/£. This price can change to US$ I.7942/E or US$1.7938/£ or US$1.7944/£ etc. but not to US$1, 7941 or $1.7939. The variation has to be necessarily

in multiples ofUS$0.0002/£. Thus, if a sterling futures passes from US$1, 8070 to US$1.7868, the variation in the value of futures contract can be worked out as follows:

Price variation = US$(1.8070 - 1.7868) = US$0.0202

So, number of ticks = US$0.0202 / US$0.0002 = 101

Value of one tick = £62500 x $0.0002/£ = $12.50

Thus the variation in the price of the sterling contract = Number of ticks x Value of one tick

=$101 x 12.50=$1262.50

This is verified by using exchange rates directly. The contract value passes from62500 x 1.8070 (or 112937.50) dollars to 62500 x 1.7868 (or 111675) dollars. The difference is $1262.50 (=$ 112937.50 - $111675).

Some currency futures exchange have daily price limits, that is, a limit as to how much the settlement price can increase or decrease from the settlement price of the previous day. In operational terms, this means that when the price limit is hit, trading will halt as a new market-clearing equilibrium price cannot be obtained. If needed, an exchange may expand the daily limit until a market-clearing price can be established.

Thus, gain or loss of a trader operating on currency futures market can be calculated in two ways. Suppose a market operator has bought 60 Euro Futures Contracts when it was trading at $1.1695/euro. These futures are being quoted at $1.1715/euro when he closes his position. His gain is calculated in two ways:

(i) Number of contracts multiplied by the number of ticks multiplied by the value of one tick.

Here number of contracts: 60

If Value of a tick is: $12.50

Number of ticks = (1.1715 – 1.1695) / 0.0001 = 20

So the gain = Number of futures contracts x Number of ticks x Value of one tick

= $60 x 20 x 12.50 = $15000

OR

(ii) Number of contracts multiplied by contract size multiplied by the price change.

Here number of contracts: 60

Size of one euro contract: .125000

Price change: $1.1715 - $1.1695 = $0.0020 per euro

So the gain = $60 x 125000 x 0.0020 = $15000

Forward contracts are tailor-made or customized instruments. However, futures are traded on organised exchanges only. Some of these are Chicago Mercantile Exchange, Philadelphia Board of Trade, London International Financial Futures Exchange (LIFFE), Tokyo International Financial Futures Exchange (TIFFE), Sydney Futures Exchange, and Singapore International Monetary Exchange (SIMEX). Volume traded on futures exchanges is smaller than that on forward market. Yet, trading in futures has been growing fast.

Buying and selling of futures takes place like other securities on an exchange. Once the orders and prices are confirmed, this information is sent to the Clearing house where accounts of buyers/sellers are adjusted. The time taken on electronic system for confirmation of buy/sell order is just a couple of seconds. The base currency for prices is US dollar. The most traded futures are euro-dollar, yen-dollar and sterling- dollar contracts. Euro-dollar contractsare going to become most dominant one in clays to come. For futures contracts, only one unified price is quoted unlike forward market where bid-ask prices with a spread are quoted. Quotations are published in financial journals such as Wall Street Journal.

There are two types of orders given by clients in the market known as limit order and market order. In case of limit order, the broker executes the order when market attains the price specified by the client or better than specified price. On the other hand, market order is executed at market price. Market operators pay commission to brokers for their services.

In case of futures contracts, buyers and sellers do not come face-to-face. They operate through the clearing house. Clearing house is an entity that acts as counter party to each transaction on futures market. Clearing house has the responsibility of maintaining accounts, margin payments and settlement of deliveries. A clearing house serves as the third party to all transactions. That is, the buyer of a futures contract effectively buys from the clearing house and the seller of a futures contract sells to the clearing house. This ensures that the buyers and sellers of the futures contracts do not have to worry about the credit worthiness of the counterparty. As a result, an active and liquid secondary market develops. Clearing members constitute the clearinghouse. Individual brokers, not being members of the clearing house deal through a clearing

member to settle a customer's trade. If one party to the futures deals defaults, it is the clearing member who stands in for the defaulting party. Subsequently, he seeks restitution from the defaulter. The liability of the clearing house is limited because futures position is marked-to market daily. In order to be able to operate on futures exchange; it is necessary to make a deposit with the clearing house. This deposit is known as Initial or Guarantee Deposit/Margin. This guarantee margin varies from one currency to another depending on its volatility. Higher the volatility, larger is the margin. For example, it may be 2000 dollars for more volatile currency and 1500 dollars for another currency with lower volatility: The system of margin can be formula-based as well. For example, it can be equal to average daily volatility.

The other term associated with Initial Margin is known as Maintenance margin. This refers to the amount that has to be maintained all the time. The balance in the margin account is not allowed to fall below this level. Rise and fall in the margin account happens because of daily changes in the value of futures contract. The change is calculated on daily basis through the process of marking-to-market. The latest rate of the day is compared with the latest rate of the previous day. In case there is variation in favour of the operator, his account is credited On the other hand, if the variation is unfavorable, his account is debited. If the balance in the margin account falls below the maintenance margin the operator is called upon to pay up the variation margin. It must be noted that margin account maintained by the clearing house is never allowed to fall below maintenance margin. Maintenance margin is a figure lower than the initial margin. For example, an initial margin may be 2000 dollars while maintenance margin may be 1600 dollars. Or, an initial margin may be 1500 dollars while maintenance margin may be 1200 dollars etc.

Trading on futures exchange is done through marking-to-market process. An operator buying or selling futures contracts makes an initial margin deposit. As you have already learnt that this deposit may be a small percentage of the contracted amount of a currency. On the very first day, closing rate (settlement rate) is compared with the buying/ selling rate and depending on the rate Movement, the margin account of the market operator is either credited or debited. Again on the next day (day 2), the closing rate of day 2 is compared with the closing rate of the previous day (day I). Yet again, the margin account is debited or credited depending on the rate movement. This process of comparing the closing rates every day with that of previous day and crediting/debiting margin accounts is what constitutes marking-to-market. In simple terms, it means that the futures contract is re-priced every day at the closing price and the difference from

the closing price of the previous day is settled by crediting/debiting the margin account. Example 15.1 explains the trading process to enable the reader to understand the steps involved.

Example 15.1

Suppose, a trader buys a December euro futures on day I when it was quoting at $1.1602/euro.He made an initial margin deposit of 2000 dollars. The maintenance margin to be considered for this example is 1600 dollars. Table 15.1 contains all relevant data.

Table 15.1: Trading Process of a Futures Contract Bought on Day 1 (Currency: Euro) at $1.1602/euro [Standard Size of a euro futures = •125000]

Day	Buying/Selling/ Settling Rate	Contract Price	Margin Adjustment	Margin Contributions (+) Withdrawal (-)	Balance in Margin Account
1 buy	$1.1602	$145025.0	0.00	+$2000	$2000.00
I settle	$1.1600	$145000.0	-$25.00	0.00	$1975.00
2 settle	$1.1597	$144962.5	-$37.50	0.00	$1937.50
3 settle	$1.1566	$144575.0	-$387.50	$450	$2000.00
4 settle	$1.1590	$144875.0	+$300.00	0.00	$2300.00
5 settle	$1.1605	$145062.5	+$187.50	0.00	$2487.50
6 sell+$100	$1.1610	$145125.0	+$62.50	0.00	$2550.00

The euro futures contract is bought at $1.1602/euro on the day 1. The price drops from $1.1602/ euro to $1.1600/ euro and therefore the buyer is supposed to compensate this drop. As he is bound to buy at $.1.1602/euro, any drop in the price is to be compensated by him and he is compensated for any increase above $1.1602/euro. In other words, for a buyer of a futures contract, a drop in price results in a loss (debit in his margin account) and an increase in price results in a gain (credit in his margin account). On the day 1, the settlement price dropped to $1.1600/euro. That is, the value of contract is reduced by $25. This is a loss to the buyer. So his margin account is debited, being brought down to $1975 from $2000. On the day 2 again, the settlement price goes down and the contract value falls to $144962.50. The margin account is debited again. On the day 3, the rate falls further such that the contract price is $144575. By now cumulative

loss is $450. So the margin account comes down to $1550 (= $2000 - $450). But this cannot be allowed since the maintenance margin is $.1600. Therefore, the market operator is called upon to meet the margin variation and to bring the margin account back to $2000. Thus he pays $450 on the day 3. It is to be noted that once the margin account falls below maintenance margin, it is to be brought back to the level of initial margin of $2000 and not simply to the level of maintenance margin of $1600.

On day 4 and 5, the settlement prices go up and therefore, the margin account of the market operator gets credited. The balance in the margin account stands at $2300 on day 4 and $2487.50 on day 5. The operator is free to withdraw the amounts of $300 and $187.50 on day 4 and day 5respectively. If he were to do so, his margin account would show $2000 on these days.

The operator does not wait till the maturity and closes his futures contract on the day 6 by selling it at $1.1610/euro. He receives $62.50 on the last day. Now let us see what is the net gain or loss to this operator. He had bought the contract at a rate of $1.1602/• and sold it back at a rate of $1.1610/•. Net gain for him is the difference between the two prices or gain per contract is $125000x(1.1.610-1.1602)=$100.

From this example, it is clear that for the buyer of futures, there is a gain whenever rate goes up whereas he incurs loss when the rate comes down.

We take another example to explain the marking-to-market process where a market operator has sold a currency future.

Example 15.2

A market operator sold a March sterling futures on day 1 at the rate of $1.8066/ £. He deposited the initial margin amount of $2000. Let us consider $1500 to be the maintenance margin. Theoperator keeps the futures contract live for 10 trading days. On the tenth day, he closes it by areverse operation. Marking-to-market process is shown through the data contained in Table 15.2

Table 15.2: Trading Process of a Futures Contract sold on Day 1 (Currency: Pound sterling) at $1.8066/£ [standard size a pound futures: £62500]

Day	Buying/Selling/ Settling Rate	Contract Price	Margin Adjustment	Margin Contributions (+) / (Withdrawal (-)	Balance in Margin Account
(1)	(2)	(3)	(4)	(5)	(6)
1 sell	$1.8066	$112912.50	$00	+$2000	$2000.00
1 settle	$1.8036	$112725	$187.50	0.00	$2187.50
2 settle	$1.8010	$112562	$162.50	0.00	$2350.00
3 settle	$1.7980	$112375	$187.50	-537.50	$2000.00
4 settle	$1.7996	$112475	-$100.00	0.00	$1900.00
5 settle	$1.8014	$112587	-$112.50	0.00	$1787.50
6 settle	$1.8044	$112775	-$187.50	0.00	$1600.00
7 settle	$ 1.8064	$112900.	-$125.00	+525.00	$2000.00
8 settle	$1.8072	$112950	-$50.00	0.00	$1950.00
9 settle	$1.8076	$112975.	-$25.00	0.00	$1925.00
10 buy	$1.8080	$113000.	-$25.00	0.00	$1900.00
		-$87.50			

As pointed out earlier, for a seller of a futures contract, there is a loss when the price goes up and a gain when it comes down. On day 1, the settlement price was $1.8036/ £, which was lower than the selling price of $1.8066/£ on day 1. So the difference of $187.50 is a gain for the operator. He could withdraw this amount. But he decides against it. Therefore, this amount got credited to his margin account, thus taking the balance to $2187.50. On the day 2 also, the settlement rate has come down. So, there is a further gain of $162.50. As a result, the balance in the margin account becomes $2350. On the third day, the settlement rate is $1.7980/£. The gain of 187.50 makes the total gains go up to $537.50. This time, the operator decides to withdraw the total sum of $537.50 and the margin account reduces to $2000. From the day 4 onwards, the rate is continuously going up as a result of which there are losses to the operator. On the days 4, 5 and 6, he does not deposit margin variation and lets the balance reduce to $ 1600. However, by the day 7, the cumulative loss has become $525. This brings down the balance in the margin account to $1475. But this cannot be allowed since maintenance margin is $1500. So, the operator is called upon to deposit $525, thus taking the balance in the margin account back to $2000. On the days 8, 9 and 10, there are further losses and the

margin account comes down to $1900. The net loss when the futures contract is closed is $87.50 as shown in the column (4) of Table 7.2. This can be readily verified from the initial selling rate on day 1 and closing rate on day 10. The loss works out to $87.50 or $62500 x (1.8066 - 1.8080).

15.4.2 Comparison between Forward and Futures Contract

As mentioned earlier, forward and futures rates are conceptually similar. Both reflect the expectation of market as to what exchange rate is likely to obtain on or around maturity date. The differences between the two relate basically to the method of trading. Table 15.3 summarizes the major differences.

Table 15.3: Comparison between Forward and Futures Contract

S. No.	Feature	Currency forward	Currency futures
1	Size of Contract	Negotiated/Tailor made/customized	Standardized
2	Quotation	Between two currencies	Generally US$/currency unit
3	Maturity	Negotiated/Tailor made/customized	Standardized
4	Location of trading	Linkage by telephone/fax	Futures Exchange
5	Rates	Normally with bid-ask spread	Unified rates quoted on the exchange
6.	Settlement	Generally delivery of currencies	In a large majority, compensations through a reverse operation
7.	Counterparties	Generally in contact with each other	Do not know each other. Clearing house is the counterparty to each side
8.	Negotiation hours	Round the clock	During market sessions
9.	Guarantee/Margin deposit	None	Initial and variation margins
10.	Marking-to-market	No such thing	Gains/losses settled everyday

15.5 OPTIONS

An option is a contract in which the seller (writer) of the option grants the buyer of the option theright to purchase from or sell to the writer a designated instrument for a specified price within aspecified period of time. Unlike a foreign exchange forward, the option does not obligate the buyer to deliver currency on the settlement date. Foreign exchange options are ideal for hedging exposures in which the amount or the timing of exposure are uncertain. Foreign exchange options allow you to protect against un - favorable currency moves while retaining the ability to participate in favorable moves.

In other words, an option is a contract that gives the holder the right, but the not the obligation,to buy (call) or sell (put) a specified underlying instrument at a fixed price before, or at, a future date. The option holder has to compensate the writer (the issuer of the instrument) for this right, and the cost borne is called the premium or the option price.

The premium should be adequate for the risk borne by the writer and yet, from the holder's point of view, must be worth paying. If the option contains provision to the effect that it can be exercised any time before the expiry of the contract, it is termed as an American Contract. If it can be exercised only on the expiry date, it is termed as European Contract.

Options contract gives the holder a right but not the obligation to buy or sell an underlying asset at a specified date in the future at a certain price. The specified date is called the expiration date. For, the contract expires on that date if the option-holder chooses not to exercise his right to buy or sell the asset. The price at which the option-holder can buy or sell the underlying asset is called the "Strike price."

When the contract gives the holder a right to buy an asset, it is termed as "Call option". Onthe other hand, an option that gives the right to sell an asset is called as "Put option". Options are available on a large variety of underlying assets like common stock, currencies, debt instruments and commodities. Also traded are options on stock indices and futures contracts where the underlying asset is a futures contract on stock index with options combined.

Options have proved to be versatile and flexible tools for risk management by themselves as well as in combination with other instruments. Options also provide a way for individual investors with limited capital to speculate on the movements of stock prices, exchange rate, commodity prices etc. The biggest advantage in this context is the limited loss feature of options.

Let us consider a typical options contract. Suppose person buy call options on RelianceIndustries Limited (RIL) at strike price of Rs. 375, expiring December. This gives one the right but not the obligation to buy RIL shares in December at a price of Rs. 375. Naturally,one would not exercise the option unless RIL's price in December is more than the strikeprice. Suppose RIL then trades at Rs. 400. The option is said to have an intrinsic value ofRs.25 that is the difference between the strike price and the market price.

Such options are said to be in-the-money as they help one to pocket gains. When the strike price is higher than the market price, the option is said to be out-of-the-money. What are the advantages of an options contract?

Suppose somebody wants to buy RIL in December but wish to know his or her outflow now Entering into a contract now to buy RIL at, say, Rs.425 in December is one way of lockinginto the outflow.

That would however, put him or her at a loss if the market price then falls below Rs.425. Thisis where an options contract helps. One would buy only if the strike price is lower than themarket price.

Types of Options

♦ Currency call option: grants its owner the right but not the obligation to buy a specific currency at a specific price (exercise price or strike price) within a specified period oftime.

♦ Currency put option: grants its owner the right and not the obligation to sell a specific currency at a specified price (the strike price) within a specified period of time.

♦ Stock option: an option on a stock is called stock option.

♦ Bond option: an option on a bond is called bond option.

♦ Stock index option: this involves buying units of index, which represents the whole market in the same proportion in which individual stocks are represented in the market.

♦ Multi-currency option: it is an arrangement whereby a borrower gets an option todraw funds in one or more of the specified currencies and switch over loans from onecurrency to another.

♦ American option: can be exercised anytime during the option period.

♦ European option: can be exercised only on the expiry or maturity date.

Options can be used for hedging currency exposures when a corporate is not sure whichway the currency is going to move. By entering into an option contract, the investor gets the best of both worlds his downside is restricted to the premium that he pays, and he enjoys an unlimited upside. For the buyer of an option, the gains are unlimited and the losses arelimited. For the writer of an option the losses are unlimited and the gains are limited to the extent of the premium he gains.

Currency Option and Two of its Components

♦ The intrinsic value: The amount by which an option is in the money. A call option whose exercise price is below the current spot price of the underlying instrument, ora put option whose exercise price is above the current spot price of the underlying instrument, is said to be in the money.

♦ The extrinsic value: It is the total premium of an option less the intrinsic value. It isalso known as the time value or volatility value. As the expiry time increases, the premium of an option also increases. However, with each passing day, the rate of increase in the premium decreases. Conversely, as an option approaches expiry, the rate of decline in its intrinsic value increases. This decline is known as the time decay.Therefore, the more volatile a currency, the higher will be its option value.

Example

Company X is importing machinery for DM 1 million. At the time the deal was struck, the DM was trading at 1.7600 to the dollar. Payment has to be made by April 30, 1998. The DM has already depreciated to 1.7700, and the company has made a tidy profit. The CFO believes that the dollar will continue to gain against the DM, but he would not like to lose the gain sheal ready made. Therefore, he buys an in-the-money DM call option, by paying an up-frontpremium of 2.01 percent. If on April 30, 1998, the DM is above 1.7900, he will let the option lapse; on the other hand, if the DM is 1.7200, he would exercise the option, and buy DM atthe predetermined rate of 1.7600.

In January, 1994, corporate houses were permitted to use currency options as a hedging product. In the absence of a rupee-yield curve a rupee-based currency options were not permitted since the pricing of such options would have been arbitrary. Therefore, the banks were allowed to offer only cross-currency options on a fully-covered basis. And the option could be cancelled only once; Chief Finance Officers (CFOs) were not permitted to re-book options against the same exposure. They could, however, hedge the exposure using theforward market. In September, 1996, corporate houses were allowed

to freely book andcancel options. But rupee-based options are still not permitted by the RBI.

Fixed Rate Debt and Embedded Options

Fixed rate debt typically includes either a prepayment option or, in the case of publicly traded debt, a call provision. In substance this right is no more and no less than a put option on interest rates and a right which becomes more valuable the further interest rates fall. By wayof contrast, swap agreements do not contain a prepayment option. The early termination ofa swap contract will involve the payment, in some form or other, of the value of the remaining contract period to maturity.

15.6 CURRENCY OPTIONS

A currency option, as the name suggests, gives its holder a right and not an obligation to buy orsell or not to buy or sell a currency at a predetermined rate on or before a specified maturity date. Options are traded on the Over-the-Counter (OTC) market as well as on organised exchanges. There are different categories of market operators such as enterprisers (known as hedgers) who use options to cover their exposures, banks that profit by speculating and arbitrageurs who profit by taking advantage of price distortions on different markets.

Earlier, all currency options were OTC options, written by international banks and investment banks. OTC options are tailor-made in terms of maturity length, exercise price and the amount of underlying currency. These contracts may be for as large amounts as more than one million dollar equivalent of underlying currency. They are available on all major international currencies such as British pound, Japanese yen, Canadian dollar, Swiss franc and euro; They are also available on some of the less traded currencies. OTC options are generally of European style.

Standardised currency option contracts started being traded for the first time in 1982 on Philadelphia Stock Exchange (PHLX). These options trade with March, June, September and December expiration cycle. They mature on the Friday before the third Wednesday of the expiration month. Table 7.5 contains the size of the underlying currency per contract. They are half the corresponding futures contract. The volume of OTC currency options trading is much larger than that of exchange option trading, the former being in the range of $100 billion per day while the latter may be just about $3 to $4 billion per day.

15.6.1 *Important Terms relating to Options*

Call option: It is the type of option that gives its holder a right to buy a currency at a pre-specified rate on or before the maturity date. Put option: It is the type of option that gives its holder a right to sell a currency at a pre-specified rate on or before the maturity date.

Premium: It is the initial amount that the buyer (also called the option holder) of the option pays up-front to the seller (also called the option writer) of the option. By paying this premium, the holder acquires a right for himself and by receiving it, the writer takes an obligation upon himself to fulfill the right of the holder. Generally, it is a small percentage of the amount to be bought or sold under the option. We use notation, c, to denote premium on call option and notation, p, to denote premium on put option.

Exercise/Strike Price (Rate): It is the exchange rate at which the holder of a call option can buy and the holder of a put option can sell the currency under the deal, irrespective of the actual spot rate at the time of exercise of option. We use "X" to denote exercise price.

Maturity Date or Expiration Date: The date on or up to which an option can be exercised. After this date, it becomes defunct and loses its validity.

American option: When the option has the possibility of being exercised on any date up to maturity, it is called American type.

European option: When an option has the possibility of being exercised only on the maturity date, it is called European type.

Value of an option: An option (whether call or put) has either a positive value or zero value. This can be explained with examples.

Suppose a European call option has an exercise price (X) of Rs 55/euro. On the date of maturity, the spot rate (ST) may be more than or equal to or less than Rs 55/euro.

(a) **Possibility I:** ST = Rs 56/euro. In this case; call option will be exercised by the holder of the option as he can obtain euros at Rs 55/euro while spot price is higher. Here, the call option is said to have a positive value of Re 1 (Rs 56 - Rs 55) or (S,-X)

(b) **Possibility II:** ST. Rs 55/euro. In this scenario, the holder has no specific advantage in buying euro either from spot market or by exercising his call option; He is indifferent between the two choices. The value of the option is zero.

(c) Possibility III: ST = Rs 53/ euro. In this case, the holder of the option will buy euro directly from the spot market by abandoning his call option. Here also, the call option has no value or zero value.

Similar scenarios can be developed to show the value of a put option.

Option-in-money: An option is said to be in-money if its immediate exercise will give a positive value. So a call option is in-money if ST > X. The value of such a call option is ST - X. Likewise, a put option is in-money if ST< X. The value of such a put option is X - ST. Here ST means the spot rate at the time of the exercise of the option.

Option-at-money: When ST = X, an option is said to be at-money Option-out-of-money: An option is said to be out-of-money when it has no positive value (knowing that an option can have either a positive or a zero value). So a call option is out-of-money if ST<X and a put option is out-of-money if ST>X. Premium (or Price) of an option:

The market operator may use a thumb rule to decide the premium or price to be paid or charged for an option. It may be a small percentage of the amount of currency transacted. However, it should be noted that this price depends on a number of factors in a rather complex way. These factors are:

(a) Time to maturity: Longer is the time to maturity, higher is the price of an option (whether call or put). If the maturity is farther in time, it means there is greater uncertainty and possibility of currency rates fluctuating in wider range is more. Hence the probability of the option being exercised increases. So the writer would demand higher premium.

(b) Volatility of the exchange rate of underlying currency: Greater volatility increases the probability of the spot rate going above exercise price for call or going below exercise price for put. That is, the probability of exercise of option increases with higher volatility. Therefore, the price of an option - whether call or put - would be higher with greater volatility of exchange rate.

(c) Type of option: Typically an American type option will have greater price since it gives greater flexibility of exercise than European type.

(d) Forward premium or discount: When a currency is likely to harden (greater forward premium), call option on it will have higher price. Likewise, when a currency is likely to decline (greater forward discount), higher will be price of a put option on it.

(e) Interest rates on currencies: Higher interest rate of domestic currency means lower present value of exercise price. So lower exercise price of a call makes it dearer as the probability of its exercise increases. On the other hand, lower exercise price lowers the probability of a put being exercised. Thus higher domestic interest rate has the effect of increasing the price of call and lowering the price of put. Similarly, higher foreign interest rate will reduce the call premium and increase put premium.

(f) Exercise Price: The call price will decrease with higher exercise price since its probability of use will be less. On the contrary, put premium will decrease with higher exercise price since the probability of its use will increase.

15.7 SWAPS

Swap in finance means an exchange of one obligation with another. Financial swaps are afunding technique, which permit a borrower to access one market or instrument and exchangethe liability for another market or instrument. Investors can exchange one type of risk withanother.

It is a device for obtaining the desired form of financing indirectly which otherwise might beinaccessible or too expensive. Swaps allow the borrowers to raise money in one market and to swap one interest rate structure for another (from fixed to floating), or swap principal andinterest from one currency to another.

Swaps are nothing but an exchange of two payment streams. Swaps can be arranged either directly between two parties or through a third party like a bank or a financialinstitution. Swap market has been developing at a fast pace in the last two decades, A currency swap enables the substitution of one debt denominated in one currency at a fixed or floating rate to a debt denominated in another currency at a fixed or floating rate. It enables both parties to draw benefit from the differences of interest rates existing on segmented markets. Thus, currency swaps can be fixed-to-fixed type as well as fixed-to-floating type.

Why swaps?

Swaps are increasingly becoming popular for the following reasons:

- Difference in borrowers and investors preferences and market access;
- A low cost device to achieve certain objectives, which can be achieved by othermeans but at a higher cost;
- Market saturation i.e. lack of availability of the desired currency due to saturation;and
- Differences in financial norms followed by different countries.

Financial Benefits Created by Swap Transactions

Consider the following statements:

1. A company with the highest credit rating, AAA, will pay less to raise funds underidentical terms and conditions than a less creditworthy company with a lower rating,say, BBB. The incremental borrowing premium paid by a BBB company, which itwill be convenient to refer to as a "Credit quality spread", is greater in relation tofixed interest rate borrowings than it is for floating rate borrowings and this spreadincreases with maturity.

2. The counterparty making fixed rate payments in a swap is predominantly the less creditworthy participant.

3. Companies have been able to lower their nominal funding costs by using swaps inconjunction with credit quality spreads.

These statements are fully consistent with the objective data provided by swap transactionsand they help to explain the "Too good to be true" feeling that is sometimes expressedregardingswaps. Can it really be true, outside of "Alice in Wonderland", that everyone can be awinner and that no one is a loser? If so, why does this happy state of affairs exist? Theanswer follows:

(a) The Theory of Comparative Advantage: When we begin to seek an answer to the questions raised above, the response we are mostlikely to meet from both market participants and commentators alike is that each of thecounterparties in a swap has a "Comparativeadvantage" in a particular and different creditmarket and that an advantage in one market is used to obtain an equivalent advantage in adifferent market to which access was otherwise denied. The AAA Company therefore raisesfunds in the floating rate market where it has an advantage, an advantage which is alsopossessed by company BBB in the fixed rate market.

The mechanism of an interest rate swap allows each company to exploit their privilegedaccess to one market in order to produce interest rate savings in a different market. Thisargument is an attractive one because of its relative simplicity and because it is fully consistentwith data provided by the swap market itself. However, as Clifford Smith, Charles Smithsonand Sykes Wilford point out in their book Managing Financial Risk, it ignores the fact thatthe concept of comparative advantage is used in international trade theory, the disciplinefrom which it is derived, to explain why a natural or other immobile benefit is a stimulus tointernational trade flows. As the authors point out: The United States has a comparativeadvantage in wheat because the United States has wheat

producing acreage not available inJapan. If land could be moved—if land in Kansas could be relocated outside Tokyo—thecomparative advantage would disappear. The international capital markets are, however,fully mobile. In the absence of barriers to capital flows, arbitrage will eliminate anycomparative advantage that exists within such markets and this rationale for the creation ofthe swap transactions would be eliminated over time leading to the disappearance of theswap as a financial instrument. This conclusion clearly conflicts with the continued andexpanding existence of the swap market.

(b) Information asymmetries: The much-vaunted economic efficiency of the capital markets may nevertheless co-exist withcertain information asymmetries. Four authors from a major US money center bank haveargued that a company will and should choose to issue short term floating rate debt andswap this debt into fixed rate funding as compared with its other financing options if:

1. It had information not available to the market generally which would suggestthat its own credit quality spread (the difference, you will recall, between the cost offixed and floating rate debt) would be lower in the future than the market expectation.

2. It anticipates higher risk-free interest rates in the future than does the market shortand is more sensitive (i.e. averse) to such changes than the market generally.In this situation a company is able to exploit its information asymmetry by issuing short termfloating rate debt and to protect itself against future interest rate risk by swapping suchfloating rate debt into fixed rate debt.

Returning to our initial question as to why an interest rate swap can produce apparentfinancial benefits for both counterparties the true explanation is, I would suggest, a morecomplicated one than can be provided by the concept of comparative advantage alone.Information asymmetries may well be a factor, together with the fact that the fixed ratepayer in an interest rate swap—reflecting the fact that he has no early termination right—isnot paying a premium for the implicit interest rate option embedded within a fixed rate loanthat does contain a pre-payment right. This saying is divided between both counterpartiesto the swap.

Types of Swaps

• Interest rate swap

• Currency swap

• Cross currency swap (combination of the above two)

15.7.1 Interest Rate Swap

Example : Company A has borrowed $10 million of a floating interest rate of LIBOR (LondonInter-Bank Offer Rate) plus 2% payable and Company B has borrowed $10 million on whicha fixed interest rate of 10% is payable. A and B enter into an interest rate swap transactionunder which A agrees to pay B a fixed interest rate of 10% and B agrees to pay A LIBOR plus2%.Swaps may result in cost savings as the two parties may have different credit risks.

Toexplain further, assume that company A has low rating and can borrow only at a fixedinterest rate. On the other hand company B is rated high and can borrow at floating ratebasis. Fixed to floating rate swap is the standard interest rate swap. It is also known as vanillaswap. This refers to an agreement between two parties that contract to make payments toone another on specified dates in future till an agreed termination date in a particular way,where one party, known as the fixed rate payer makes an agreed payment. The other partyknown as the floating rate payer makes payments pegged to the movement of a particularinterestrate index. Usually LIBOR is used as the underlying interest rate index.

There are three types of interest rate Swaps:

- Coupon swaps: fixed to floating rates or vice versa.

- Basis swaps: the exchange of one benchmark for another under floating rates(LIBOR for Treasury bill rate)

- Cross currency interest rates swap: this swap has fixed rate flows in one currencyfor floatingrate flows in another currency.

Interest rate swap: More Issues

An interest rate swap is a contractual agreement entered into between two counterpartiesunder which each agrees to make periodic payment to the other for an agreed period of timebased upon a notional amount of principal. The principal amount is notional because thereis no need to exchange actual amount of principal in a single currency transaction: there isno foreign exchange component to be taken account of. Equally, however, a notional amountof principal is required in order to compute the actual cash amounts that will be periodicallyexchanged.

Under the commonest form of interest rate swap, a series of payments calculated by applyinga fixed rate of interest to a notional principal amount is exchanged for a stream of paymentssimilarly calculated but using a floating rate of interest. This is a

fixed-for-floating interest rate swap. Alternatively, both series of cash flows to be exchanged could be calculated usingfloating rates of interest but floating rates that are based upon different underlying indices.Examples might be LIBOR and commercial paper or Treasury bills and LIBOR and this formof interest rate swap is known as a basis or money market swap.

Pricing Interest Rate Swaps

If we consider the generic fixed-to-floating interest rate swap, the most obvious difficulty tobe overcome in pricing such a swap would seem to be the fact that the future stream offloating rate payments to be made by one counterparty is unknown at the time the swap isbeing priced. This must be literally true: no one can know with absolute certainty what the6 months US dollar LIBOR rate will be in 12 months' time or 18 months' time. However, if thecapital markets do not possess an infallible crystal ball in which the precise trend of futureinterest rates can be observed, the markets do possess a considerable body of informationabout the relationship between interest rates and future periods of time.

Reversing or Terminating Interest Rate Swaps

The point has been made above that at inception the net present value of the aggregate cashflows that comprise an interest rate swap will be zero. As time passes, however, this willcease to be the case, the reason for this being that the shape of the yield curves used to pricethe swap initially will change over time. Assume, for example, that shortly after an interestrate swap has been completed there is an increase in forward interest rates, the forwardyield curve steepens. Since the fixed rate payments due under the swap are, by definition,fixed, this change in the prevailing interest rate environment will affect future floating ratepayments only; current market expectations are that the future floating rate payments dueunder the swap will be higher than those originally expected when the swap was priced.This benefit will accrue to the fixed rate payer under the swap and will represent a cost tothe floating rate payer. If the new net cash flows due under the swap are computed and ifthese are discounted at the appropriate new zero coupon rate for each future period (i.e.reflecting the current zero coupon yield curve and not the original zero coupon yield curve),the positive net present value result reflects how the value of the swap to the fixed rate payerhas risen from zero at inception. Correspondingly, it demonstrates how the value of theswap to the floating rate payer has declined from zero to a negative amount.

If, the floating rate payer wishes to terminate the swap with the fixed rate payer's agreement,then the positive net present value figure we have calculated represents the terminationpayment that will have to be paid to the fixed rate payer. Alternatively, if the floating ratepayer wishes to cancel the swap by entering into a reverse swap a new counterparty for theremaining term of the original swap, the net present value figure represents the paymentthat the floating rate payer will have to make to the new counterparty in order for him toenter into a swap which precisely mirrors the terms and conditions of the original swap.

Credit Risk Implicit in Interest Rate Swaps

To the extent that any interest rate swap involves mutual obligations to exchange cash flows,a degree of credit risk must be implicit in the swap. Note however, that because a swap is a notional principal contract, no credit risk arises in respect of an amount of principal advancedby a lender to a borrower which would be the case with a loan. Further, because the cashflows to be exchanged under an interest rate swap on each settlement date are typically"Netted" (or offset) what is paid or received represents simply the difference between fixedand floating rates of interest. Contrast this again with a loan where what is due is an absoluteamount of interest representing either a fixed or a floating rate of interest applied to theoutstanding principal balance. The periodic cash flows under a swap will, by definition, besmaller therefore than the periodic cash flows due under a comparable loan.An interest rate swap is in essence a series of forward contracts on interest rates. In distinctionto a forward contract, the periodic exchange of payment flows provided for under an interestrate swap does provide for a partial periodic settlement of the contract but it is important toappreciate that the net present value of the swap does not reduce to zero once a periodicexchange has taken place. This will not be the case because as discussed in the context ofreversing or terminating interest rate swaps the shape of the yield curve used to price theswap initially will change over time giving the swap a positive net present value for eitherthe fixed rate payer or the floating rate payer not withstanding that a periodic exchange ofpayments is being made.

Users and Uses of Interest Rate Swaps

Interest rate swaps are used by a wide range of commercial banks, investment banks, nonfinancialoperating companies, insurance companies, mortgage companies, investmentvehicles and trusts, government agencies and sovereign states for one or more of the followingreasons:

1. To obtain lower cost funding

2. To hedge interest rate exposure

3. To obtain high yielding investment assets

4. To create types of investment asset not otherwise obtainable

5. To implement overall asset or liability management strategies

6. To take speculative positions in relation to future movements in interest rates.

The Advantages of Interest Rate Swaps

1. A floating –to-fixed swap increases the certainty of an issuer's future obligations.

2. Swapping form fixed-to-floating rate may save the issuer money if interest ratesdecline.

3. Swapping allows issuers to revise their debt profile to take advantage of current or expectedfuture market conditions.

4. Interest rates swaps are a financial tool that potentially can help issuers lower theamount of debt service.

   Typical transactions would certainly include the following, although the range of possiblepermutations is almost endless.

(a) Reducing funding costs. A US industrial corporation with a single A credit ratingwants to raise US\$ 100 million of seven year fixed rate debt that would be callable at parafter three years. In order to reduce its funding cost it actually issues six month commercialpaper and simultaneously enters into a seven year, non-amortizing swap under which itreceives a six month floating rate of interest (Libor Flat) and pays a series of fixed semiannualswap payments. The cost saving is 100 basis points.

(b) Liability management. A company actually issues seven year fixed rate debt which iscallable after three years and which carries a coupon of 7%. It enters into a fixed-to-floatinginterest rate swap for three years only under the terms of which is pays a floating rate ofLibor + 185 bps and receives fixed rate of 7%. At the end of three years the company hasflexibility of calling its fixed rate loan—in which case it will have actually borrowed on asynthetic floating rate basis for three years—or it can keep its loan obligation outstandingand pay a 7% fixed rate for further four years. As a further variation, the company's fixed-to-floating interest rate swap could be an "Arrears reset swap" in which—unlike aconventional swap—the swap rate is set at the end and not at the beginning of each period.This effectively extends the company's exposure to Libor by one additional interest periodwhich will improve the economics of the transaction.

(c)   Speculative position. The same company described in (b) above may be willing to take a position on short term interest rates and lower its cost of borrowing even further (provided that its judgment as to the level of future interest rates is correct). The company enters into a three year "Yield curve arbitrage swap" in which the floating rate payments it makes under the swap are calculated by reference to a formula. For each basis point that Libor rises, the company's floating rate swap payments rise by two basis points. The company's spread over Libor, however, falls from 185 bps to 144 bps. In exchange, therefore, for significantly increasing its exposure to short term rates, the company can generate powerful savings.

(d)   Hedging interest rate exposure. A financial institution providing fixed rate mortgages is exposed in a period of falling interest rates if homeowners choose to pre-pay their mortgages and re-finance at a lower rate. It protects against this risk by entering into an "Index amortizing rate swap" with, for example, a US regional bank. Under the terms of this swap the US regional bank will receive fixed rate payments of 100 bps to as much as 150 bps above the fixed rate payable under a straightforward interest swap. In exchange, the bank accepts that the notional principal amount of the swap will amortize as rates fall and that the faster rates fall, the faster the notional principal will be amortized. A less aggressive version of the same structure is the "Indexed principal swap". Here the notional principal amount continually amortizes in line with a mortgage pre-payment index such as PSA but the amortization rate increases when interest rates fall and the rate decreases when interest rates rise.

(e)   Creation of new investment assets. A UK corporate treasurer whose company has substantial business in Spain feels that the current short term yield curves for sterling and the peseta which shows absolute interest rates converging in the two countries is exaggerated. Consequently he takes cash currently invested in the short term sterling money markets and invests this cash in a "Different swap". A differential swap is a swap under which the UK Company will pay a floating rate of interest in sterling (6 month. Libor) and receive, also in sterling, a stream of floating rate payments reflecting Spanish interest rates plus or minus a spread. The flows might be: UK Corporation pays six month sterling Libor flat and receives six month Peseta MIBOR less 210 bps paid in sterling. Assuming a two year transaction and assuming sterling interest rates remained at their initial level of 5.25%, peseta MIBOR would have to fall by 80 bps every six months in order for the treasurer to earn a lower return on his investment than would have been received from a conventional sterling money market deposit.

(f) Asset management. A German based fund manager has a view that the sterling yieldcurve will steepen (i.e. rates will increase) in the range two to five years during the next threeyears he enters into a "Yield curve swap" with a German bank whereby the fund managerpays semi-annual fixed rate payments in DM based on the two year sterling swap rate plus50 bps. Every six months the rate is re-set to reflect the new two year sterling swap rate. Hereceives six months fixed rate payments calculated by reference to the five year sterling swaprate and re-priced every six months. The fund manager will profit if the yield curve steepensmore than 50 bps between two and five years.

Example

Company X has obtained a loan of $20 million, with interest rates pegged to the six-monthLIBOR. The CFO is of the view that interest rate in US are on the rise. To prevent a loss byway of a higher interest outflow in the coming years, he decided to enter into an interestswap with his banker. Essentially, the banker agrees to pay the corporate a six-month LIBORrate in return for a fixed interest payment by the corporate.The possibilities are almost endless but the aforementioned examples do give some generalindication of how interest rate swaps can be and are being used.

15.7.2 Currency Swaps

In Great Britain, during the 1970's, the British government sought to encourage domesticinvestment by taxing foreign-exchange transactions on its own currency. This control made it difficult for British multinational companies to transact in the foreign exchange market. Asa result, British companies often engaged in what was known as back-to-back loans.

A back-to-back loan involves two companies located in separate countries. Each companywill borrow money in their domestic financial marketplace and then lend this borrowedmoney to the other firm. By this simple exchange, each company can access the capitalmarkets in the other country without involving foreign exchange transactions.The currency swap is merely a simple extension of the back-to-back loan concept. The back-to-back loan suffered two problems that gave birth to currency swaps.

1. Finding counterparty with mirror image needs was often an exhaustive task for a corporation.

2. Secondly, as these back-to-back loans were two different loans, they were evidenced by two loan agreements, completely separate from one another.

Currency swaps solved these problems to great extent. The currency swap would operate ina manner such that two counterparties would be brought together by a central matchmaker,or swap dealer (often an investment house or a bank) thus eliminating the exhaustive searchcosts to the corporation of finding another counterparty. Secondly, the transaction wouldnow be witnessed by one document that would spell out the circumstances and provisionsunder the possibility of default by one counterparty.

A currency swap converts a stream of cash flow from one currency to another withoutexchange rate risk. Currency swaps enable a corporation to lower its borrowing costs in anydesiredcurrency. The basic principle is that a corporation should borrow in the country inwhich it receives the cheapest possible source of financing. A currency swap would thenenable it to convert this to inexpensive financing in the desired currency.

In currency swap, both principal and interest payments in one currency are exchanged toanother currency. An exchange of principal amounts in the beginning and re-exchange attermination is also possible. This may take the form of fixed to fixed, fixed to floating andfloating to floating currency swaps.

♦   Fixed to fixed currency swap involves exchange of principals which are equivalentand denominated in different currencies, where both the parties make fixedpayments to each other till the termination on a specified date.

♦   Floating to floating swap involves both payments at floating rate but in differencecurrencies.

♦   Fixed to floating currency swap is a combination of fixed to fixed and floating tofloating currency swap.

Currency swaps involve an exchange of cash flows in two different currencies. A currencyswap is a contract which commits two counter parties to an exchange, over an agreed period,two streams of payments in different currencies. These payments are each calculated using adifferent interest rate. At the end of the period, exchange takes place of the correspondingprincipal amounts, at an exchange rate agreed at the start of the contract.Currency swap differ from interest swaps on the following counts:

1.   An exchange of payments in two currencies.

2.   Not only exchange of interest, but also an exchange of principal amounts.

3.   Unlike interest rate swaps, currency swaps are not off balance sheet instruments sincethey involve exchange of principal at the end of the period.

4. The interest payments at various intervals are calculated either at a fixed interest rateor a floating rate index as agreed between the parties.

5. Currency swaps can also use two fixed interest rates for the two different currencies -different from the interest rate swaps.

6. The agreed exchange rate need not be related to the market.

7. The principal amounts can be exchanged even at the start of the swap

Example of Parallel Loan

Four parties are involved.

1) U.K. parent company, and

2) Subsidiary company in Canada.

3) Canadian parent company, and

4) Subsidiary in U.K.

Assume that typical borrowing costs are 10% in U.K. and 11 % in Canada. U.K. parentcompany would like to borrow money to finance expansion of its subsidiary in Canada. If itborrows in U.K. (pounds) and converts to C\$ it will have to pay a price and is exposed torisk. Also, the Canadian subsidiary is not well known in Canada, so it would have to pay a2% risk premium over the normal rate (11 + 2 = 13%), and 13% is considered too high.Assume that the Canadian parent company is in the same situation, it has a subsidiary inUK that would have to pay a 3% risk premium because it is not well known in UK. Borrowingcosts in UK (pounds) for the Canadian subsidiary would be 10% + 3% = 13%, which isconsidered to be excessive.

Parallel Loan

U.K. parent company borrows. in U.K. at 10% in £s, and re-lends the money to the Canadiansubsidiary in U.K. Canadian parent company borrows C\$ at 11% and re-lends the money tothe U.K. subsidiary in Canada. Since no currency leaves the respective countries no exposureand no taxes if applicable.

During the loan, the U.K. subsidiary in Canada earns C\$ to pay the interest and principal.The Canadian subsidiary in U.K. earns pounds to pay back the loan. Result: U.K. subsidiaryin Canada pays 11 % instead of 13% (savings of 2%) and the Canadian subsidiary in UKpays 10% instead of 13% (savings of 3%).

Back-to-Back Loan

Similar to a Parallel loan, but only involves 2 parties, not 4. Assume that the same conditionshold, interest = 10% in UK and interest = 11 % in Canada. British parent firm borrows inU.K. at 10% and re-lends to Canadian parent firm. Canadian parent firm borrows in Canadaat 11 % and re-lends those funds to UK firm. UK firm makes payments annually to Canadianfirm in C$ and Canadian firm makes payments to UK firm in pounds.

In this case the two parent companies deal directly with each other, so there are only twoparties to the agreement, vs. four parties in the last example.

Potential Problems with Parallel and Back-to-Back Loans:

1. Time-consuming and expensive to set up. You have to search for and find two MNC'sin almost the exact opposite position at the same time.

2. Potential for default. What if the Canadian subsidiary of the U.K. firm defaults on theparallel loan? The parent is still liable. To minimize these problems a legal documentcalled a "rights of set-off" is usually in effect to address the potential problems of default.

Currency Swap Example

In US

U.S. MNC like GM has a subsidiary in Germany, and there is an investment opportunity forexpansion in Germany that will require 40m and will have an economic life of 5 years. Currentspot rate is $0.90/, so the firm could consider raising $36m in U.S. by issuing bonds at 8%(payable in Dollars), and converting $36m to 40m to finance the expenditure. Hopefully CFs(in Euros) would be generated from the project to make the interest payments in $.

Problem

Transaction Exposure (potential change in the financial position of the project due to currencychanges over 5 years), because German earnings are in Euros, interest payments due in U.S.are in USD. What is the MNC worried about?

Alternative: Raise 40m in the Eurobond market by issuing 5-year Eurobonds, payable inEuros. Eurobond rate is 6% for a well-known firm, but the German subsidiary of the U.S.MNC pays 7% because it is unknown (1% risk premium).

In Germany

Assume there is a German MNC with a mirror-image financing need. It has a U.S. subsidiaryneeding $36m for an expansion project in U.S. with a 5-year life.

Problem:

Transaction Exposure German MNC could borrow Euros in Germany at 6% convert to dollars,but there is transaction exposure since dollar CFs would be generated in U.S. to make Eurointerest payments in Germany. Worried about what over 5 years???

Alternative: Company could issue Eurodollar bonds in U.S., but would face a 9% (normalrate is 8%) interest rate because the German subsidiary is not well-known in U.S.

Opportunity:

Swap Bank could arrange a Currency Swap to:

1) Eliminate the long-term currency risk for both MNCs (transaction exposure), and

2) Reduce interest expense for both companies.

Each company has a "comparative advantage" at raising money in its home country,so each MNC would issue debt domestically at a savings of 1 % compared to the foreignMNC raising funds (U.S. company raises $36m in U.S. at 8%, vs. 9% for the GermanMNC; German company raises 40m in Germany at 6%, vs. 7% for the U.S. MNC).

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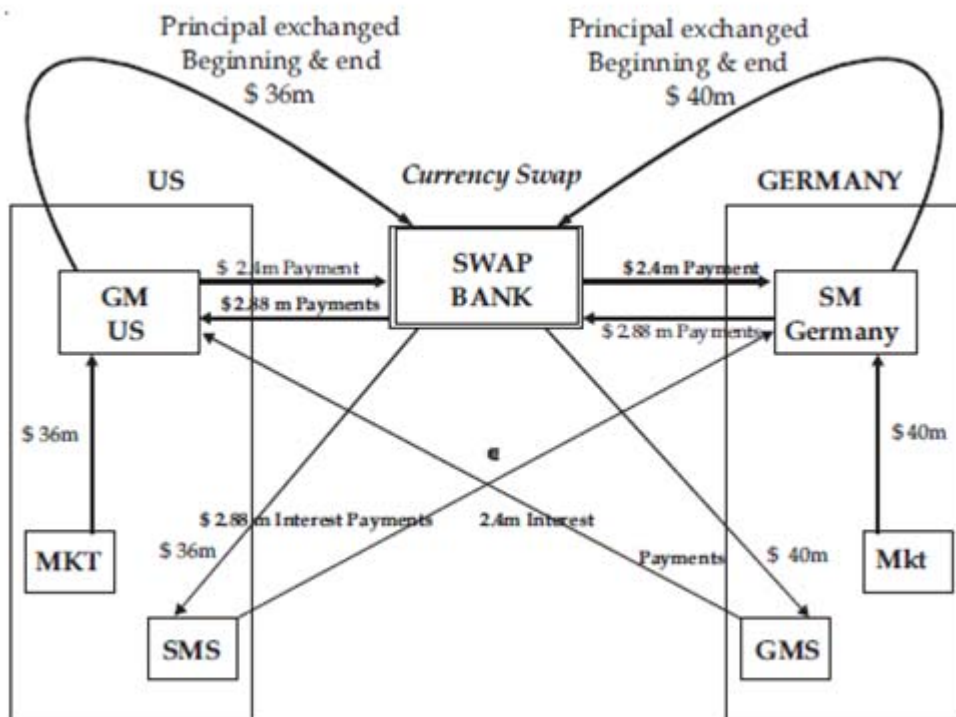
The principal sums would be exchanged through a Swap Bank - U.S. company transfers$36m to the German subsidiary in U.S. and the German company transfers 40m to the U.S.subsidiary in Germany. Every year the U.S. subsidiary in Germany would submit .2.4m (40m@ 6% - instead of borrowing at 7%) to its parent company in U.S., which would transfer themoney to the Swap Bank, which transfers funds to the German MNC to pay the Euro loan.The German subsidiary in U.S. would submit $2.88m ($36m @ 8% - instead of 9% on its own)to the German MNC, which would transfer the money to the Swap Bank, and the bankwould transfer to the U.S. MNC to pay for the dollar loan. At maturity, principal paymentswould take place the same way.

Currency swap locks in three ex-rates :

1. Principal sums are exchanged at the current ex-rate, $36m/c40m = $.90/.

2. The contractual (implicit) exchange rate for the annual payments would be $1.20/ ,which is fixed.

3. The implied exchange at maturity for last interest payment and principal payment isalso fixed,

viz. the prevailing spot rate.

Therefore, the currency swap locks in a fixed exchange rate and there is no currencyrisk.

Note:

At first it might seem like the German company is not getting as good of a deal compared tothe U.S. firm. The German MNC borrows Euros at 6% but pays 8% in U.S. dollars. However,IRP should hold, making the two interest rates equal after adjusting for the expected changein thevalue of the currencies. Since int. rates are higher (lower) in the U.S. (Germany), thedollar (c) is expected to depreciate (appreciate), by 2% per year. German MNC pays back theloan with a currency (USD) that is depreciating (USD is depreciating by 2% per year), Eurois appreciating by 2% per year.

German MNC borrows cs @ 6%, pays loan back in USDs at 8%, but since the dollar (Euro) isdepreciating (appreciating) by 2%/year, the effective borrowing cost in Euros is 6%.U.S. MNC borrows $s @ 8%, pays back Euros @ 6%, but since the USD (Euro) is gettingweaker (stronger) by 2%, the effective borrowing cost in $ is 8%.

Point:

In equilibrium (lAP), if the Euro is selling at a forward premium of +2%/year, the BorrowingEuros at 6% is exactly equivalent to borrowing dollars at 8%.

15.8 MONEY MARKET OPERATIONS

Money market is a market for short-term instruments. In this market you can borrow or lendfor a short period of time. Salient features are:

1. Short period of time – ranges from an "overnight" time period (a day comprising 24 hours from the close of business hours on day – 1 till close of business hours on day-2) to generally six to twelve months.

2. Each time period will have its own interest rates – lowest for overnight periods, and increasing gradually with the tenor of the borrowing/lending.

3. Money market rates are always given in nominal annual rates. If a rate of 8% is quoted, itmeans 8% per annum and will have to be adjusted for the relevant time period. A three-month tenor would thus carry interest at 2% (8 x 3/12)

4. Interest or deposit rates differ from country to country, and hence currency to currency.

15.8.1 Concept of Money Market Hedge

Most corporates would like to avoid the risk associated with fluctuating foreign exchangerates. Consider an Indian exporter who is expecting a receivable of $ 1 million to maturethree months from now. Being an Indian company, it would like to know with as muchcertainty as possible how many rupees it will obtain by selling the dollars. Unfortunately,since it does not know what the $ - Re rate would be three months from now, the companyhas an exposure. The company can hedge its risk in two ways. It could sell dollars forward ata rate which it can obtain from the bank today and thus know for certain the quantum ofrupee inflows after three months.

Alternatively, the company could borrow dollars suchthat the repayment of principal and interest after three months would exactly equal $ 1 million.The company can repay its loan with the receivables maturing after three months. Meanwhile,it does not really need the dollars it has borrowed today. So, it could convert into rupees andinvest for three months at a rate of interest which is known today. In either case, the companyknows with certainty what its rupee inflow would be after three months.

A similar approach can be used in the case of a $ 1 million payable. In this case, the companycould buy $ 1 million forward at a rate which is known today. Alternatively, it could borrowrupees, convert into dollars and invest the foreign currency so obtained to ensure that thedollar investment maturing after three months will be just sufficient to settle the payable.Since it knows exactly how many rupees it will have to repay after three months, it hassuccessfully locked in the cost of funds.

We can now summarize the rules for hedging receivables and payables using forward andmoney markets.

a) Receivables.

Using Forward market: Sell the receivable forward

Using Money market: Borrow the foreign currency today and repay with the receivable.

Convert the foreign currency borrowed into home currency and invest.

b) Payables

Forward market: Buy the payable forward

Money market: Borrow the home currency, convert into foreign currency, and invest the foreign currency so obtained to ensure that the investment can be used to settle thepayable. Payoff the home currency loan.

When money market hedging is not beneficial?

When Interest rate parity holds and no arbitrage -opportunities exist, Money Market Hedgeand forward hedge provide identical costs. In such a scenario, money market hedging is not beneficial.

15.8.2 Process of Money Market Hedge:

Money market hedge involves:

• Borrowing in foreign currency (say $) in the case of exports

• Investing in foreign currency (say ¥) in the case of imports

Steps to be adopted:From the view point ofImporter Exporter

1. Find whether the importer or exporter have a foreign currency asset or liability. Importer will have a FC liability Exporter will have a FC asset.

2. Create Hedge Position Importer will create a FC asset Exporter will create a FC liability.

3. Borrow Amount required to be borrowed to Hedge Position Importer will borrow home currency, for an amount equivalent to PV of FC liability, at the foreign currency deposit rate. Exporter will borrow in FC abroad. Amount will be equal to PV FC asset, discounted at borrowing rate.

4. Convert the borrowed money into the required currency Home currency into foreign currency at spot rate. Foreign currency so borrowed will be converted into home currency at spot rate.

5. Invest the amount which is converted Invest that foreign currency in abroad, as a deposit, carrying interest at such deposit rate Investment becomes an asset Invest the domestic currency to earn interest in home deposits.

6. Settle encash the invested amount with interest to settle FC liability Receive maturity proceeds of FC asset and settle FC liability. Receive the asset value from overseas customer, andsettle FC liability there itself.

15.9 NOTES

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15.10 SUMMARY

Derivative is an instrument that derives its value from an underlying asset or rate. Common derivatives are Futures, Options and Swaps: A futures contract is an agreement to make or take delivery of a specified quantity of an underlying asset at an agreed price on a future date. For currency futures, the underlying asset is an amount of foreign currency. An option is a right but not an obligation to make or take delivery of a specified quantity of an underlying asset (for example, an amount of foreign currency) at an agreed price on a future date. A Swap contract represents an exchange of two streams of payments between two parties.

The specific features of futures contract consist of (a) Standardisation in terms of size, maturity and variation in the value, (b) Trading on organised exchanges, (c) Clearing house, acting as a counterparty (d) Initial and maintenance margin and (f) Marking-to-market process. Futures contracts have standard sizes and well-defined maturity dates.

A large majority of market participant's close their positions on futures through reverse operations before their maturity date arrives, thus avoiding physical delivery of assets. Tick is the minimum variation in the price of the underlying asset. Larger variations can be only as multiples of ticks. For futures contracts, only one unique price is quoted unlike forwards where price is quoted with buy-sell spread.

Clearing house acts as counterparty to each transaction on futures exchange. Clearing house has the responsibility of maintaining accounts, margin payments and settlement of deliveries. Every operator buying or selling futures has to deposit an initial margin, also known as guarantee deposit. Trading on futures exchange is done through the process of marking-to-market which means that a futures contract is repriced every day at its closing price. Options are of two types, known as call and put option respectively.

Call option gives its holder a right to buy an asset (currency) at a pre-specified rate on or before the maturity date. Put option gives its holder a right to sell an asset (currency) at a pre-specified rate on or before the maturity date. Premium is the amount that the buyer (holder) of an option pays upfront to the seller (writer) of the option. The terms exercise price and strike price are used synonymously. Exercise price is the exchange rate at which the holder of a call option can buy and the holder of a put option can sell the currency under the deal. Maturity date is the date up to which or on which an option can be exercised. An American type option can he exercised on any date up to the maturity date.

A European type option can beexercised only on the maturity date. An option is in-money if its immediate exercise will give a positive value. An option is out-of-money if it has no positive value. An option is at-money when spot price is equal to strike price. Profit resulting from a call option is given by the following equation: Profit $= S_T - X - c$ for $S_T > X = -c$ for $S_T < X$ Profit resulting from a put option is given by the following equation: Profit $= X - S_T - p$ for $S_T < X = -p$ for $S_T > X$

A Swap is an exchange of two payment streams. A Swap deal can be either fixed-to- fixed or fixed-to-floating type.

15.10 KEY WORDS

- **Derivative:** A financial instrument that derives its value from an underlying asset or a rate.

- **Futures:** A derivative instrument which entails an agreement to make or take delivery of a specified quantity of an underlying asset on a future date at an agreed price.

- **Option:** A Derivative instrument giving a right to its holder but not an obligation to buy or sell a specified quantity of an underlying asset on or up to a specified future date.

- **Call option**: An option that gives its holder a right to buy an underlying asset.

- **Put option:** An option that gives its holder a right to sell an underlying asset.

- **Swap:** It is a contract involving an exchange of two streams of payments between two parties.

15.11 SELF-ASSESSMENT QUESTIONS

1) Explain the meaning of a derivative.

2) Explain with an example marking-to-market process in case of futures trading.

3) Write the relationship between premium charged for a call and a put option respectively.

4) Describe a swap deal with an illustration.

5) A December yen futures is bought when it was quoting at $0.008900/yen. The settling rates on day 1, day 2, day 3, day 4, and day 5 were $0.0088, $0.0087, $0.00865, $0.0085 and $0.00845 respectively. On the day 6, the futures contract was closed through a reverse operation when it was quoting at $0.0084/yen. Write

the variation in the contract price and find the net loss or gain when the futures contract was closed on the day 6. Consider the standard size of the yen futures to bed ¥12.5 million.

6) Prepare a table and a graph of the profit profile of the buyer of a call option with following features: Current spot rate: Rs 43/$ Exercise price: Rs 43.50/$ Call premium: Rs 1.20/$ 7) Develop a swap strategy for two companies ICO and USCO with the knowledge that ICO wants a floating rate dollar debt while USCO wants a fixed rate rupee debt. Assume your own data. An intermediary bank wants to make a gain of 0.2 per cent for itself to work out a swap deal. Find the net rates the two companies would pay for their desired borrowings, if they were to benefit equally in terms of lower interest rates.

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UNIT - 16 : MULTINATIONAL COST OF CAPITAL AND CAPITAL STRUCTURE

Structure :

16.0 OBJECTIVES

After studying this lesson, you should be able to;

- Understand the conceptual framework needed to compute the cost of capital of multinational firms;

- Know how to determine discount rates for foreign investment projects; and

- Judge various issues in estimating foreign projects beta.

- Understand how to determine an optimum mix of debt and equity for an MNC;

- Know the characteristics of an MNC that might cause its cash flow to be more volatile than a domestic firm;

- Discuss advantages and disadvantages of a localized financial structure for an MNC;

16.1 INTRODUCTION

A central question for multinational corporations is whether the required rate of return on foreign projects should be higher, lower, or the same as that for domestic projects. To answer this question, we must examine the issue of cost of capital for multinational firms, one of the most complex issues in international financial management. Yet it is an issue that must be addressed, because the foreign investment decision cannot be made properly without knowledge of the appropriate cost of capital.

The cost of capital for a given investment is the minimum risk-adjusted return required by shareholders of the firm for undertaking that investment. As such, it is the basic measure of financial performance. Unless the investment generates sufficient funds to repay suppliers of capital, the firm's value will suffer. This return requirement is met only if the net present value of future project cash flows, using the project's cost of capital as the discount rate, is positive.

Because cost-of-capital measures for multinational firms are to be used as discount rates to aid in the global resource-allocation process, the rates must reflect the value to firms of engaging in specific activities. Thus, the emphasis here is on the cost of capital or required rate of return for a specific foreign project rather than for the firm as a whole. Unless the financial structures and commercial risks are similar for all projects engaged in, the use of a single overall cost of capital for project evaluation is incorrect. Different discount rates should be used to value projects that are expected to change the risk complexion of the firm.

The cost of capital refers to the minimum rate of return that a firm must earn on its investments so as to keep the value of the enterprise intact. It represents the rate of return which the firm must pay to the suppliers of capital for using their funds. The cost of capital of a firm is mainly used to evaluate investment projects. It represents minimum acceptable rate of return on new investments. The basic factors underlying the cost of capital for a firm are the degree of risk associated with the firm, the taxes it must pay, and the supply of and demand of various types of financing.

The determination of the firm's cost of capital is important because it:

i.   Provides the very basis for financial appraisal of new capital expenditure proposals and thus serves as acceptance criterion for capital expenditure projects,

ii.   Helps the managers in determining the optimal capital structure of the firm,

iii. Serves as the basis for evaluating the financial performance of top management,

iv.   Helps in formulating dividend policy and working capital policy, and

v.   Can serve as capitalization rate which can be used to determine capitalization of a new firm.

16.2 COST OF CAPITAL AND INTERNATIONAL FINANCIAL ENVIRONMENT

A multinational corporation operates in multi-economic environment comprising of international, host country, and domestic financial environment. Therefore, the cost of capital for a multinational firm can be affected by any of the factors present in these environments. In general, following factors affect the cost of capital:

1.   The availability of capital: In multinational environment, the firm has access to domestic and international financial markets, thereby its access to liquidity increases and firm can choose capital with lower cost of capital.

2.   Segmented markets: Segmented national capital markets can distort the cost of capital for the firms domiciled in these markets. The segmentation of markets is created by the barriers to free flow of capital. In developing countries capital account out flows are restricted therefore inflows also get restricted and the cost of capital rises.

3.   Political risk adjustment: Cost of capital of every foreign project is to be adjusted for political risk. This risk is additional to other project specific risks. This makes the asking rate of return to rise.

4. Taxation policies: Taxation policies of both the home and host government affect the cost of capital. The firm has to consider how a firm should include tax considerations when sourcing funds and making financial structure decisions.

5. Financial disclosures and cost of capital: The firm's financial disclosures for obtaining funds from international market affect the cost of capital. Various capital markets have different disclosure norms. The market where disclosure norms are well defined and are strictly implemented, the asking rate or return falls because of less degree of risk therefore in these markets the cost of capital declines. American disclosure norms are stringent consequently most of Indian companies follow GDR route to obtain capital from American capital market.

6. Optimal financial structure: Multinational operations may change a firm's optimal financial structure. The added international availability of capital and ability to diversify cash flows internationally affects the firm's optimal debt ratio.

7. International and host country lending norms: The financial structure of affiliates have to take into account the lending norms of international agencies or host country and a compromise has to be reached to reflect affiliate's need of liquidity, minimization of foreign exchange and political risk, fulfilling of legal requirements and the tax minimization. All these necessities increase the cost of capital.

16.3 MARKET SEGMENTATION AND COST OF CAPITAL

A national market is segmented if the required rate of return on securities in that market differs from the required rate of return on securities of comparable expected return and risk that are traded on other national securities markets. If the markets are integrated, the securities of comparable expected return and risk should have the same required rate of return in each national market after adjusting for foreign exchange risk and political risk. The main causes of market segmentation are:

1. Information barriers: The important information barriers are- language, accounting principles, and quality of disclosures. If language of the prospectus cannot be understood by investors, or international accounting standards are not adhered to or expected disclosures are not made, the required rate of return by the investor's increases.

2. Regulatory barriers: Taxation of capital gains varies dramatically from country to country. If taxes are high, the asking rate of return would be higher.

3. Transaction costs: Imposition of higher taxes is a direct way to segment the market. Another way which segments the market indirectly is to quote larger spread, indicating low degree of competition among brokers and dealers.

4. Exchange rate fluctuations: If exchange rates fluctuate, the investors fear the market and therefore they ask for higher rate of return.

5. Small country bias: Small countries have small markets, therefore the economies of scale are not possible. Hence, the asking rate of return usually becomes higher.

6. Political risk: The possibility of political risk increases the cost of capital. Greater the political risk index, higher is the risk premium.

16.4 THE COST OF EQUITY CAPITAL

The cost of equity capital for a firm is the minimum rate of return necessary to induce investors to buy or hold the firm's stock. This required return equals a basic yield covering the time value of money plus a premium for risk. Because owners of common stock have only a residual claim on corporate income, their risk is the greatest, and so also are the returns they demand.

Alternatively, the cost of equity capital is the rate used to capitalize total corporate cash flows. As such, it is just the weighted average of the required rates of return on the firm's individual activities. From this perspective, the company is a mutual fund of specified projects, selling a compound security to capital markets. According to the principle of value additively, the value of this compound security equals the sum of the individual values of the projects.

Although the two definitions are equivalent, the latter view is preferred from a conceptual standpoint because it focuses on the most important feature of the cost of equity capital since this cost is not an attribute of the firm but is a function of the riskiness of the activities in which it engages. Thus, the cost of equity capital for the firm as a whole can be used to value the stream of future equity cash flows-that is, to set a price on equity shares in the firm. It cannot be used as a measure of the required return on equity investments in future projects unless these projects are of a similar nature to the average of those already being undertaken by the firm.

One approach to determining the project-specific required return on equity is based on modern capital market theory. According to this theory, an equilibrium relationship exists between an asset's required return and its associated risk, which can be represented by the capital asset pricing model or CAPM:

ri = rf + βi(rm - rf)   (1)

Where

ri = equilibrium expected return for asset i

rf = rate of return on a risk-free asset, usually measured as the yield on a 30-day government Treasury bill

rm = expected return on the market portfolio consisting of all risky assets

âi= cov(ri, rm)/ó2(rm), where cov(ri, rm) refers to the covariance between returns on security i and the market portfolio and ó2(rm) is the variance of returns on the market portfolio.

The CAPM is based on the notion that intelligent, risk-averse shareholders will seek to diversify their risks, and as a consequence, the only risk that will be rewarded with a risk premium will be systematic risk. As can be seen from Equation 1, the risk premium associated with a particular asset i is assumed to equal âi (rm – rf), where âi is the systematic, or non-diversifiable risk of the asset. In effect, â (beta) measures the correlation between returns on a particular asset and returns on the market portfolio, The term rm - rf is known as the market risk premium.

Where the returns and financial structure of an investment are expected to be similar to those of the firm's typical investment, the corporate-wide cost of equity capital may serve as a reasonable proxy for the required return on equity of the project. In this case estimates of the value of the project's beta can be found either by direct computation using the CAPM or through professional investment companies that keep track of company betas.

It should be emphasized again that using a company beta to estimate the required return on a project's equity capital is valid only for investments with financial characteristics typical of the "pool" of projects represented by the company. This cost-of-equity capital estimate is useless in calculating project-specific required returns on equity when the characteristics of the project diverge from the corporate norm.

16.5   THE WEIGHTED AVERAGE COST OF CAPITAL FOR FOREIGN PROJECTS

The required return on equity for a particular investment assumes that the financial structure and risk of the project is similar to that for the firm as a whole. This cost of equity capital, ke is then combined with the

After-tax cost of debt, id (1 – t), yield a weighted average cost of capital (WACC) for the parent and the project, k0 computed as

$$K0 = (1 - L) ke + Lid (1 - t) \quad (2)$$

Where L is the parent's debt ratio (debt to total assets). This cost of capital is then used as the discount rate in evaluating the specific foreign investment. It should be stressed that ko is the required return on the firm's stock given the particular debt ratio selected.

Two caveats in employing the weighted average cost of capital are appropriate here. First, the weights must be based on the proportion of the firm's capital structure accounted for by each source of capital using market, not book values. Second, in calculating the WACC, the firm's historical debt-equity mix is not relevant. Rather, the weights must be marginal weights that reflect the firm's target capital structure, that is, the proportions of debt and equity the firm plans to use in the future.

Book value of weights: The book value weights are derived from the stated values of individual components of the capital structure on the firm's current balance sheet. There are two major advantages to book value weights, (i) the proportions of the capital structure are stable over time because book value weights do not depend on market prices, and (ii) book value weights are easy to determine because they are derived from stated values on the firm's balance sheet.

One important problem with these weights is that the value of bonds and equity change over time because of the change in market conditions therefore these may not reflect the desired value of capital structure.

Market value weights: Market value weights are based on the current market prices of bonds and stock. Because the primary goal of a firm is to maximize its market value, therefore this set of weights are consistent with the company's objective. The market value of the company's securities depends on the expected earnings of the company and the risk of the securities as perceived by the investors. Thus the market values reflect assessments of current buyer and sellers of future earnings and the risk. This weighted average cost of capital with market value weights should be the right average rate of return required by the investors from the firm's securities.

Example 1. Estimating the weighted average cost of capital

Suppose a company is financed with 60 per cent common stock, 30 per cent debt, and 10 per cent preferred stock, with respective after-tax costs of 20 per cent, 6 per cent, and 14 per cent. Based on the financing proportion and the after-tax costs of the various capital component and Equation 2, the WACC for this firm is calculated as 15.2 per cent ($0.6 \times 0.20 + 0.3 \times 0.06 + 0.1 \times 0.14$). If the net present value of those cash flows-discounted at the

weighted average cost of capital is positive, the investment should be undertaken; if it is negative, the investment should be rejected.

However, both project risk and project financial structure can vary from the corporate norm. It is necessary, therefore, to adjust the costs and weights of the different cost components to reflect their actual values

16.5.1 Costing various sources of funds

Suppose a foreign subsidiary requires I dollars to finance a new investment to be funded as follows: P dollars by the parent; Ef dollars by the subsidiary's retained earnings; and Df dollars by foreign debt, with P + Ef + Df = I. To compute the projects weighted cost of capital, we first must compute the individual cost of each component.

Parent company funds: The required rate of return on parent company funds is the firm's marginal cost of capital, k0. Hence, parent funds invested overseas should yield the parent's marginal cost of capital provided that the foreign investments undertaken do not change the overall riskiness of the MNC's operations.

Retained earnings: The cost of retained earnings overseas, ks is a function of dividend withholding taxes, tax deferral, and transfer costs. In general, if T equals the incremental taxes owed on earnings repatriated to the parent, then ks = ke (1 − T).

Local currency debt: The after-tax cost of borrowing locally, if equals the sum of the after-tax interest expenses plus the expected exchange gain or loss.

16.5.2 Computing the weighted average cost of capital

With no change in risk characteristics, the parent's after-tax cost of debt and equity remain at id (1 − t) and ks respectively. As introduced above, the subsidiary's cost of retained earnings equals k, and its expected after- tax cost of foreign debt equals if. Under these circumstances the weighted cost of capital for the project equals

KI = k0 − a(ke − ks) − b[id(1 − t) − if]   (3)

Where a = Ef/I and b = Df/I. If this investment changes the parent's risk characteristics in such a way that its cost of equity capital is k´e, and its cost of debt id rather than i´d, Equation 3 becomes instead

KI = k0 + (1 − L) (k´e − ke) + L (i´d − id) (1 − t) − a(k´e − ks) − b[i´d (1 − t) − if] …(4)

Example 2. Estimating a foreign project's weighted average cost of capital

Suppose that a new foreign investment requires Rs. 100 million in funds. Of this total, Rs. 20 million will be provided by parent company funds, Rs. 25 million by retained

earnings in the subsidiary, and Rs. 55 million through the issue of new debt by the subsidiary. The parent's cost of equity equals 14 per cent, and its after-tax cost of debt is 5 per cent. If the firm's current debt ratio, which is considered to be optimal, is 0.3 then k0 equals 11.3 per cent (0.14 × 0.7 + 0.05 × 0.3). However, this project has higher systematic risk than the typical investment undertaken by the firm, thereby requiring rate of return of 16 per cent on new parent equity and 6 per cent on new parent debt. Based on an incremental tax of 8 per cent on repatriated earnings, the cost of retained earnings is estimated to be 14.7 per cent [0.16 × (1 – 0.08). Let the nominal rate of interest be 20 per cent, with an anticipated average annual devaluation of 7 per cent. Then with a foreign tax rate of 40 per cent, the expected after-tax dollar cost of the debt is 4.2 per cent [0.20 × (1 – 0.4) (1 – 0.07) – 0.07].

Applying equation 4, the project's weighted average cost of capital is

Kf = 0.113 + 0.7 (0.16 – 0.14) + 0.3 (0.06 – 0.05) – [25/1000 (0.16 – 0.147) – 55/100 (0.06 – 0.042)] = 0.117.

The parent's weighted average cost of capital for this project would have been 13 per cent (0.16 × 0.7 + 0.06 × 0.3) in the absence of the retained earnings and foreign debt financing.

16.6 THE ALL-EQUITY COST OF CAPITAL FOR FOREIGN PROJECTS

The various adjustments needed to go from the weighted average cost of capital for the firm to the weighted average cost of capital for the project makes it a somewhat awkward technique to use at times. An alternative is the use of an all-equity discount rate, k*, that abstracts from the project's financial structure and that is based solely on the riskiness of the project's anticipated cash-flows. In other words, the all-equity cost of capital equals the company's cost of capital if it were all-equity financed, that is, with no debt.

To calculate the all-equity rate, we rely on the CAPM introduced earlier in Equation 1:

$$k* = rf + (\beta*(rm - rf) \quad (5)$$

Where â* is the all-equity beta— that is, the beta associated with the unleveraged cash flows.

Example 3. Estimating a foreign project's cost of capital

Suppose that a foreign project has an all-equity beta of 1.15, the risk-free return is 7 per cent, and the required return on the market is estimated at 15 per cent. Then based on Equation 5, the project's cost of capital is

K* = 0.07 + 1.15 (0.15 – 0.07) = 16.2 per cent

In reality, of course, the firm will not be able to estimate â* with the degree of precision implied here. Instead, it will have to use guesswork based on theory. The considerations involved in the estimation process are discussed in the following section.

If the project is of similar risk to the average project selected by the firm, it is possible to estimate â* by reference to the firm's stock price beta, âe. In other words, âe is the beta that appears in the estimate of the firm's cost of equity capital, ke, given its current capital structure.

To transform â e into â*, we must separate out the effects of debt financing. This operation is known as un-levering, or converting a levered equity beta to its unlevered or all-equity value. Un-levering can be accomplished by using the following approximation:

$$\beta^* = \beta e \,/\, [1 + (1 - t)\, D/E] \quad (6)$$

Where t is the firm's marginal tax rate and DIE is its current debt-to- equity ratio. Thus, for example, if a firm has a stock price beta of 1.1, a debt/equity ratio of 0.6, and a marginal tax rate of 35 per cent, Equation 6 estimates its all-equity beta as 0.79 [1.1/(1 + 0.65 × 0.6)].

16.7 DISCOUNT RATES FOR FOREIGN INVESTMENTS

The importance of the CAPM for the international firm is that the relevant component of risk in pricing a firm's stock is its systematic risk -that is, that portion of return variability that cannot be eliminated through diversification. Evidence suggests that most of the economic and political risk faced by MNCs is unsystematic risk, which therefore can be eliminated through diversification on the level of the individual investor. Although these risks maybe quite large, they should not affect the discount rate to be used in valuing foreign projects.

On the other hand, much of the systematic or general market risk affecting a company, at least as measured using a stock index such as the Standard and Poor's 500, is related to the cyclical nature of the national economy in which the company is domiciled. Consequently, the returns on a project located in a foreign country whose economy is not perfectly synchronous with the home country's economy should be less highly correlated with domestic market returns than the returns on a comparable domestic project. If this is the case, then the systematic risk of a foreign project actually could be lower than the systematic risk of its domestic counterpart.

Paradoxically, it is the less developed countries (LDCs), where political risks are greatest, that are likely to provide the largest diversification benefits. By contrast, the correlation among the economic cycles of developed countries is considerably stronger, so

the diversification benefits from investing in industrialized countries, from the standpoint of a western investor are proportionately less.

It should be noted, however, that the systematic risk of projects even in relatively isolated LDCs is unlikely to be far below the average for all projects because these countries are still tied into the world economy. The important point about projects in LDCs, then, is that their ratio of systematic to total risk generally is quite low; their systematic risk, although perhaps slightly lower, is probably not significantly less than that of similar projects located in industrialized countries.

Even if a nation's economy is not closely linked to the world economy, the systematic risk of a project located in that country might still be rather large. For example, a foreign copper-mining venture probably will face systematic risk very similar to that faced by an identical extractive project in the United States, whether the foreign project is located in Canada, Chile, or Zaire. The reason is that the major element of systematic risk in any extractive project is related to variations in the price of the mineral being extracted, which is set in a world market. The world market price, in turn, depends on worldwide demand, which itself is systematically related to the state of the world economy, By contrast, a market-oriented project in an LDC, whose risk depends largely on the evolution of the domestic market in that country, is likely to have a systematic risk that is small in both relative and absolute terms.

An example of the latter would be a Ford plant in Brazil whose profitability is closely linked to the state of the Brazilian economy. The systematic risk of the project, therefore, largely depends on the correlation between the Brazilian economy and the US economy. Although positive, this correlation is much less than 1.

Thus, corporate international diversification should prove beneficial to shareholders, particularly where there are barriers to international portfolio diversification. To the extent that multinational firms are uniquely able to supply low-cost international diversification, investors may be willing to accept a lower rate of return on shares of MNCs than on shares of single-country firms. By extension, the risk premium applied to foreign projects may be lower than the risk premium for domestic ones; that is, the required return on foreign projects may be less than the required return on comparable domestic projects. The net effect may be to enable MNCs to undertake overseas projects that would otherwise be unattractive.

However, if international portfolio diversification can be accomplished as easily and as cheaply by individual investors, then, although required rates of return on MNC securities would be lower to reflect the reduced co-variability of MNC returns caused by international

diversification, the discount rate would not be reduced further to reflect investors' willingness to pay a premium for the indirect diversification provided by the shares of MNCs. In fact, investors actually undertake very little foreign portfolio investment. The lack of widespread international portfolio diversification has an important implication for estimating the beta coefficient.

16.8 ISSUES IN ESTIMATING FOREIGN PROJECT'S BETA

Although the CAPM is the model of choice for estimating the cost of capital for foreign projects, the type of information that is needed to estimate foreign subsidiary betas directly– a history of past subsidiary returns or future subsidiary returns relative to predicted market returns does not exist. About the only practical way to get around this problem is to find publicly traded firms that share similar risk characteristics and use the average beta for the portfolio of corporate surrogates to proxy for the subsidiary's beta. This approach, however, introduces three additional questions for a multinational:

1. Should the corporate proxies be Indian or local (i.e., foreign) companies? Although local companies should provide a better indication of risk, such companies may not exist. By contrast, selecting Indian proxies ensures that such proxies and their data exist, but their circumstances-and hence their betas– may be quite different than those facing the foreign subsidiaries. In addition, it is important to differentiate between the unsystematic risks faced by a foreign project– which individual investors can eliminate through diversification– and the systematic risks affecting that project, which may be small relative to the project's total risk.

2. Is the relevant base portfolio against which the proxy betas are estimated the Indian market portfolio, the local portfolio or the world market portfolio? Selecting the appropriate portfolio matters because a risk that is systematic in the context of the local market portfolio may well be diversifiable in the context of the Indian or world portfolio. If this is the case, using the local market portfolio to calculate beta will result in a higher required return– and a less desirable project– than if beta were calculated using the Indian or world market portfolio.

3. Should the market risk premium be based on the Indian market or the local market? One argument in favor of using the local-market risk premium is that this is the risk premium demanded by investors on investments in that market. On the other hand, esti- mates of the local-market risk premium may be subject to a good deal of statistical error. Moreover, such estimates may be irrelevant to the extent that an MNC's investors are not the same as the investors in the local market and the two sets of investors measure risk differently.

Let us now address those three questions and their related issues. As in any application of a theoretical model, the suggested answers are not precisely right but rather are based on a mix of theory, empirical evidence, and judgment.

Proxy companies: Three alternatives for estimating proxy betas are proposed here. These alternatives are presented in order of their desirability. Other approaches are also mentioned.

Local Companies: As much as possible, the corporate proxies should be local companies. The returns on an MNC's local operations are likely to depend in large measure on the evolution of the local economy. Inevitably, therefore, the timing and magnitude of these returns will differ from those of the returns generated by comparable Indian companies. This means that the degree of systematic risk for a foreign project, at least as measured from the perspective of an Indian investor, may well be lower than the systematic risk of comparable Indian companies. Put differently, using Indian companies and their returns to proxy for the returns of a foreign project will likely lead to upward biased estimate of the risk premium demanded by the MNC's investors. '

Some indication of the upward bias in the estimate of beta imparted by using Indian proxy companies to estimate the betas for foreign projects is provided by presenting foreign market betas relative to the Indian index for some foreign countries. The betas for foreign markets from an Indian perspective are calculated in the same way that asset betas are calculated:

$$\text{Foreign market beta} = \frac{\text{Correlation with Indian market} \times \text{Standard deviation of foreign market}}{\textit{Standard Deviation of Indian Market}}$$

Proxy Industry: If foreign proxies are not directly available, a second alternative is to find a proxy industry in the local market, that is, one who's Indian industry beta is similar to that of the project's Indian industry beta.

MULTINATIONAL CAPITAL STRUCTURE

In estimating the weighted average cost of capital for an MNC or its affiliates, we take the capital structure as given. However, the capital structure itself should be the outcome of an optimal global financial plan. This plan requires consideration not only of the component costs of capital, but also of how the use of one source affects the cost and availability of other sources. A firm that uses too much debt might find the cost of equity (and new debt) financing prohibitive. The capital structure problem for the multinational enterprise, therefore,

is to determine the mix of debt and equity for the parent entity and for all consolidated and unconsolidated subsidiaries that maximizes shareholder wealth.

The focus is on the consolidated, world-wide capital structure because suppliers of capital to a international firm are assumed to associate the risk of default with the MNC's world-wide debt ratio. This association stems from the view that bankruptcy or other forms of financial distress in an overseas subsidiary can seriously impair the parent company's ability to operate domestically. Any deviations from the MNC's target capital structure will cause adjustments in the mix of debt and equity used to finance future investments.

Another factor that may be relevant in establishing a worldwide debt ratio is the empirical evidence that earnings variability appears to be a decreasing function of foreign-source earnings. Because the risk of bankruptcy for a firm is dependent on its total earnings variability, the earnings diversification provided by its foreign operations may enable the multinational firm to leverage it more highly than can a purely domestic corporation, without increasing its default risk.

16.9 CAPITAL STRUCTURE OF MNC VERSUS DOMESTIC FIRM

There is no consensus on its issue because some characteristics of MNC may favour a debt intensive capital structure while other characteristics may favour an equity intensive capital structure. The arguments are as follows:

A debt intensive capital structure would favour a firm that has stable net cash inflows since it could readily make the interest payments on debt with these cash inflows. Since the MNCs are often well diversified geographically, the diversification reduces risk, therefore, the impact of any single event on net cash flow is tolerable. Consequently, an MNC will be able to handle a greater debt burden as a percentage of capital than a purely domestic firm.

The other characteristics of an MNC that might cause its cash flow to be more volatile than a purely domestic firm are:

(a) The earnings of subsidiary company earnings are subject to host government tax rules that could change over time;

(b) Host government could force the local subsidiaries to maintain all earnings within the country. This is the case of blocked funds which destabilizes the net cash flows from the subsidiary to the parent. In the absence of cash flow, it may not be able to make its periodic interest payments to creditors. In this case, MNCs should maintain an equity intensive capital structure. However, a well-diversified MNC would not face this kind of problem;

(c) The MNCs are affected by exchange rate variations, their net cash flows may be more unstable, e.g. if rupee strengthens, an Indian based MNC may generally prefer that its subsidiaries remain their earnings by reinvesting in them in their respective countries. However, if the capital structure is highly leveraged, the MNC's parent may need rupee inflows immediately to make its interest payments to creditors, and

(d) If an MNC is well diversified among countries, then the subsidiary earnings are in a variety of currencies. Therefore, the strengthening of rupee against one or a few currencies will not significantly reduce the total amount of rupees received by the Indian headquarters after converting foreign earnings from various countries into rupees. The MNC could therefore maintain a debt intensive capital structure even though it relies on foreign subsidiary earnings to make interest payments on its outstanding debt.

Studies on US MNCs indicate that the MNCs had significantly lower financial leverage than the domestic firms but that the results varied significantly among industries.

Thus we see that the capital structure decision should be made individually by each firm as after considering all characteristics that might affect its ability to make periodic interest payments on outstanding debt. MNCs that generate more stable net cash flows can maintain a leveraged capital structure. While adapting to the local capital structure following advantages and disadvantages should be borne in mind:

The main advantages are as follows:

1. A localized financial structure reduces the criticism of foreign affiliate that had been operating with too high a debt ratio.

2. A localized financial structure helps in evaluating the returns on investments, relative to local competitors in the same industry.

3. In economies where interest rates are relatively high because of scarcity of capital, the penalty paid for borrowing local funds reminds the management that unless the returns on the assets, i.e. negative leverage they are probably misallocating the scarce resources.

The disadvantages of localized capital structures are:

1. A subsidiary might be having the comparative advantage only in sourcing of capital from the parent. Therefore once it starts adopting the local capital structure, it looses the comparative advantage.

2. If the financial structure of each subsidiary company is localized, the consolidation of the balance sheet of all the subsidiaries may not conform to any particular financial structure.

3. This feature could increase perceived financial risk.

4. This may push the consolidated debt ratio out of discretionary range of acceptable debt ratios in the flat area of the cost of capital.

5. A multinational firm will not be able to replace the high cost debt of an affiliate with low cost debt if the markets are segmented and the Fisher effect does not operate.

6. The debt ratio of a foreign affiliate, in reality, is cosmetic. The lenders look towards parent rather than the subsidiary for amortization of loans.

16.10 FOREIGN SUBSIDIARY CAPITAL STRUCTURE

After a decision has been made regarding the appropriate mix of debt and equity for the entire corporation, questions about individual operations can be raised. How should MNCs arrange the capital structures of their foreign affiliates? And what factors are relevant in making this decision? Specifically, the problem is whether foreign subsidiary capital structures should

• Conform to the capital structure of the parent company

• Reflect the capitalization norms in each foreign country

• Vary to take advantage of opportunities to minimize the MNC's cost of capital

The parent company could finance its foreign affiliates by raising funds in its own country and investing these funds as equity. The overseas operations would then have a zero debt ratio (debt/total assets). Alternatively, the parent could hold only one unit of currency of share capital in each affiliate and require all to borrow on their own, with or without guarantees; in this case, affiliate debt ratios would approach 100 per cent. Or the parent could itself borrow and relend the money as intra- corporate advances. Here again, the affiliates' debt ratios would be close to 100 per cent. In all these cases, the total amount of borrowing and the debt/equity mix of the consolidated corporation are identical. Thus, the question of an optimal capital structure for a foreign affiliate is completely distinct from the corporation's overall debt/equity ratio.

Moreover, any accounting rendition of a separate capital structure for the subsidiary is wholly illusory unless the parent is willing to allow its affiliate to default on its debt.

Fig. 16.1. Subsidiary capital structure: Debt-to-Equity Ratios

| I. 100% Parent Financed		II. 100% Parent Financed	
Rs. 100	D = 50	Rs. 100	D = Rs. 100
	E = 50		E = 0
D/E = 1 : 1		D/E = Infinity	
III. 100% Parent Financed		**IV. 100% Bank Financed**	
Rs. 100	D = Rs. 0	Rs. 100	D = Rs. 100
	E = 100		E = 0
D/E = 0		D/E = Infinity	

As long as the rest of the MNC group has a legal or moral obligation or sound business reasons for preventing the affiliate from defaulting, the individual unit has no independent capital structure. Rather, it's true debt/equity ratio is equal to that of the consolidated group. Fig. 16.1 and 16.2 show the stated and the true debt-to-equity ratios for a subsidiary and its parent for four separate cases. In cases I, II, and III, the parent borrows Rs.100 to invest in a foreign subsidiary, in varying portions of debt and equity. In case IV, the subsidiary borrows the Rs.100 directly from the bank. Depending on what the parent calls its investment, the subsidiary's debt-to-equity ratio can vary from zero to infinity. Despite this variation, the consolidated balance sheet shows a debt-to-equity ratio after the foreign investment of 4:7, regardless of how the investment is financed and what it is called.

Fig. 16.3 shows that the financing mechanism does affect the pattern of returns, whether they are called dividends or interest and principal payments. It also determines the initial recipient of the cash flows. Are the cash flows from the foreign unit paid directly to the outside investor (the bank) or are they first paid to the parent, which then turns around and repays the bank?

Fig. 16.2. Consolidated parent balance sheet debt-to-equity ratios

Before foreign investment	
Rs. 1000	D = Rs. 300
	E = 700
D/E = 3 : 7	

After Foreign Investment	
Case I, II, and III Parent Financed with 100% Bank Debt	Case IV, Subsidiary Financed with 100% Bank debt
Domestic Rs. 1,000 | D= Rs. 400	Domestic Rs.1,000 | D= Rs. 400
Foreign 100 | E=700	Foreign 100 | E=700
D/E = 4 : 7	D/E = 4 : 7

Fig. 16.3. Subsidiary capital structure
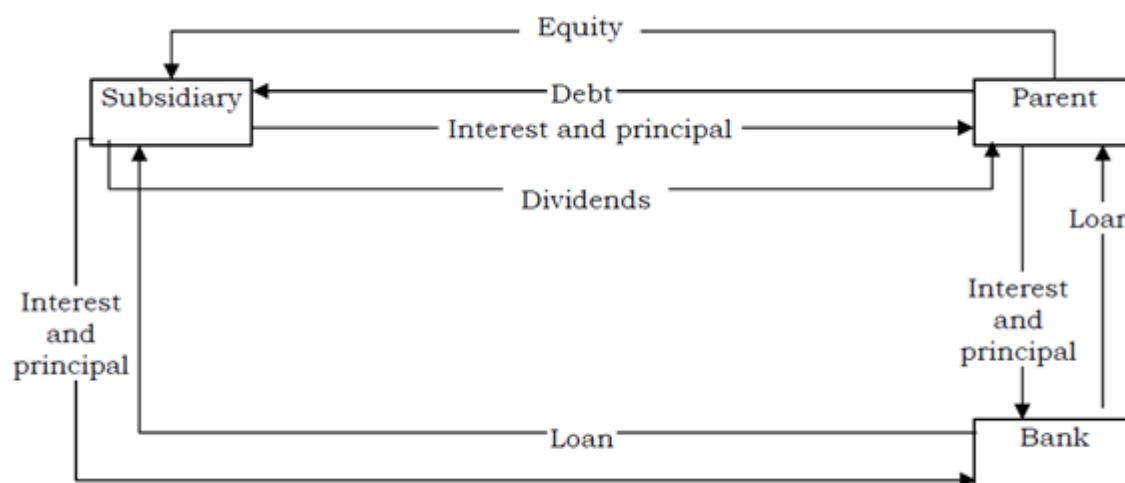
The point of this exercise is to show that like the case for the corporation as a whole, an affiliate's degree of leverage does not determine its financial risk. Therefore, the first two options-having affiliate financial structures conform to parent or local norms– are unrelated to shareholder wealth-maximization.

The irrelevance of subsidiary financial structures seems to be recognized by multinationals. In a 1979 survey by Business International of eight U.S.-based MNCs, most of the firms expressed little concern with the debt/equity mixes of their foreign affiliates. Their primary focus was on the worldwide, rather than individual, capital structure. The third

option of varying affiliate financial structures to take advantage of local financing opportunities appears to be the appropriate choice. Thus, within the constraints set by foreign statutory or minimum equity requirements, the need to appear to be a responsible and good guest, and the requirements of a worldwide financial structure, a multinational corporation should finance its affiliates to minimize its incremental average cost of capital.

A subsidiary with a capital structure similar to its parent may forgo profitable opportunities to lower its cost of funds or its risk. For example,rigid adherence to a fixed debt/equity ratio may not allow a subsidiary to take advantage of government-subsidized debt or low-cost loans from international agencies. Furthermore, it may be worthwhile to raise funds locally if the country is politically risky. In the event the affiliate is expropriated, for instance, it would default on all loans from local financial institutions. Similarly, borrowing funds locally will decrease the company's vulnerability to exchange controls. Local currency (LC) profits can be used to service its LC debt.

Borrowing in the local currency also can help a company reduce its foreign exchange exposure. If financing opportunities in various currencies are fairly priced, firms can structure their liabilities to reduce their exposure to foreign exchange risk at no added cost to shareholders. The basic rule is to finance assets that generate foreign-currency cash flows with liabilities denominated in those same foreign currencies.

On the other hand, forcing a subsidiary to borrow funds locally to meet parent norms may be quite expensive in a country with a high-cost capital market or if the subsidiary is in a tax-loss-carryforward position. In the latter case, because the subsidiary cannot realize the tax benefits of the interest write-off, the parent should make an equity injection financed by borrowed funds. In this way, the interest deduction need not be sacrificed.

16.11 COST MINIMIZING APPROACH TO GLOBAL CAPITAL STRUCTURE

The cost-minimizing approach to determining foreign-affiliate capital structures would be to allow subsidiaries with access to low-cost capital markets to exceed the parent-company capitalization norm, while subsidiaries in higher-capital-cost nations would have lower target ratios. These costs must be figured on an after-tax basis, taking into account the company's worldwide tax position.

A subsidiary's capital structure is relevant only insofar as it affects the parent's consolidated worldwide debt ratio. Foreign units are expected to be financially independent after the parent's initial investment. The rationale for this policy is to 'avoid giving management a crutch." By forcing foreign affiliates to stand on their own feet, affiliate managers presumably

will be working harder to improve local operations, thereby generating the internal cash flow that will help replace parent financing. Moreover, the local financial institutions will have a greater incentive to monitor the local subsidiary's performance because they can no longer look to the parent company to bail them out if their loans go sour.

However, companies that expect their subsidiaries to borrow locally had better be prepared to provide enough initial equity capital or subordinated loans. In addition, local suppliers and customers are likely to shy away from a new subsidiary operating on a shoestring if that subsidiary is not receiving financial backing from its parent. The foreign subsidiary may have to show its balance sheet to local trade creditors, distributors, and other stakeholders. Having a balance sheet that shows more equity demonstrates that the unit has greater staying power.

16.12 JOINT VENTURES

Because many MNCs participate in joint ventures, either by choice or necessity, establishing an appropriate financing mix for this form of investment is an important consideration. The previous assumption that affiliate debt is equivalent to parent debt in terms of its impact on perceived default risk may no longer be valid. In countries such as Japan and Germany, increased leverage will not necessarily lead to increased financial risks, due to the close relationship between the local banks and corporations. Thus, debt raised by a joint venture in Japan, for example, may not be equivalent to parent-raised debt in terms of its impact on default risk. The assessment of the effects of leverage in a joint venturerequires a qualitative analysis of the partner's ties with the local financial community, particularly with the local banks.

Unless the joint venture can be isolated from its partners' operations, there are likely to be some significant conflicts associated with this form of ownership. Transfer pricing, setting royalty and licensing fees, and allocating production and markets among plants are just some of the areas in which each owner has an incentive to engage in activities that will harm its partners. These conflicts explain why bringing in outside equity investors is generally such an unstable form of external financing.

Because of their lack of complete control over a joint venture's decisions and its profits, most MNCs will, at most, guarantee joint-venture loans in proportion to their share of ownership. But where the MNC is substantially stronger financially than its partner, the MNC may wind up implicitly guaranteeing its weaker partner's share of any joint-venture borrowings, as well as its own. In this case, it makes sense to push for as large an equity base as possible; the weaker partner's share of the borrowings is then supported by its larger equity investment.

16.13 OPTIMAL CAPITAL STRUCTURE

When companies mobilize funds, they are mainly concerned with the marginal cost of funds. The companies should always try to expand keeping in view their optimal capital structure. However, as their capital budget expands in absolute terms, their marginal cost of capital (MCC) will eventually increase. This means that companies can tap the capital market for only some limited amount in the short run before their MCC rise, even though the same optimum capital structure is maintained.

In one analysis, we hold the total amount of capital constant and change only the combination of financing sources. We seek the optimum or target capital structure that yields the lowest cost of capital. Now weattempt to determine the size of the capital budget in relation to the levels of MCC so that the optimum capital budget can be determined. The optimum capital budget is defined as the amount of investment that maximizes the value of the company. It is obtained at the intersection between the internal rate of return (IRR) and the MCC. At this point, total profit is maximized.

A variety of factors affect a company's cost of capital: its size, access to capital markets, diversification, tax concessions, exchange rate risk, and political risk. The first four factors favour the multinational company, whereas the last two factors favour the purely domestic company. Figure 4 shows multinational companies usually enjoy a lower cost of capital than purely domestic companies for a number of reasons. Firstly the multinational companies usually enjoy a lower cost of capital than purely domestic companies for a number of reasons. Firstly the multinational companies may borrow money at lower rates of interest because they are bigger, (ii) they may raise funds in a number of capital markets, (iii) the MNCs are more diversified than purely domestic companies, and (iv) the MNCs are able to lower their overall taxes because they can use tax heavens. The MNCs are less risky than purely domestic companies and because these not only diversify in domestic investment projects but across countries also. The lower overall risk of multinational companies tends to reduce their overall taxes because they can use tax heavens. The MNCs are less risky than purely domestic companies and because these not only diversify in domestic investment projects but across countries also. The lower overall risk of multinational companies tends to reduce their overall cost of capital.
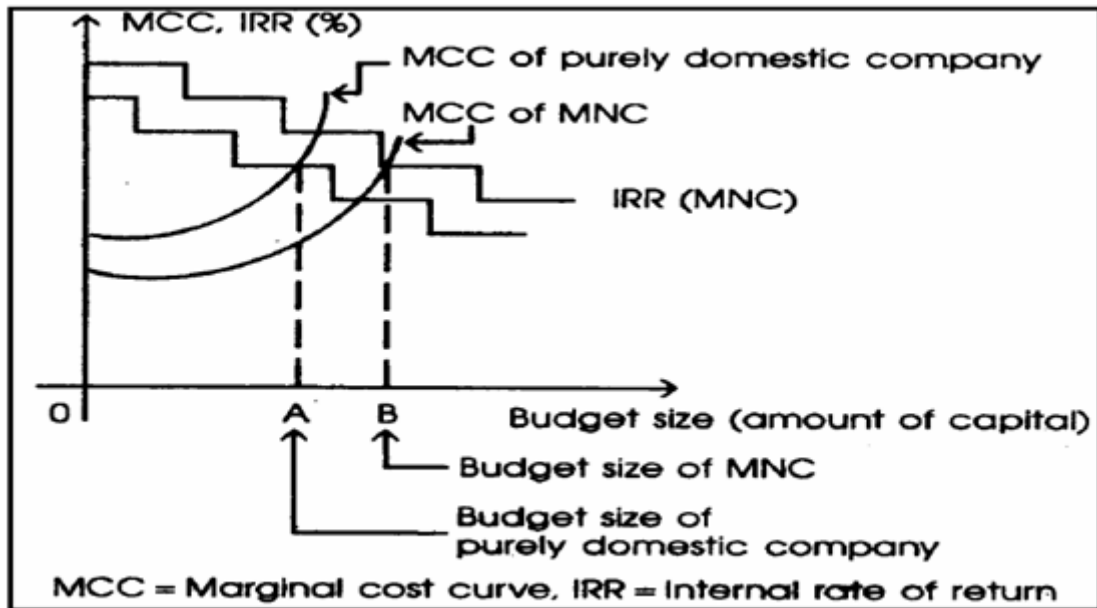
Fig. 16.4. Optimum capital structure

Figure 16.4 shows that the optimum capital budget (B) of a typical multinational company is higher than the capital budget (A) of a purely domestic company. The multinational corporations can tap foreign capital markets, when the domestic markets are saturated and their risk is lower than that of purely domestic companies. International capital availability and lower risk permit multinational companies to lower their cost of capital and maintain a constant MCC for a broad range of their capital budget. They have more investment opportunities than purely domestic companies. These two factors give multinational company higher optimum capital structure than the optimum structure of domestic companies.

16.14 EMPIRICAL STUDIES AND CAPITAL STRUCTURE OF AFFILIATES

To minimize the cost of capital for a given level of business risk and capital budget is an objective that should be implemented from the perspective of the multinational firms. The capital structure of affiliate is relevant only to the extent that it affects this overall objective. Thus an individual affiliate may not really have an independent cost of capital; therefore its financial structure may not be based on the objective of minimizing its own cost of capital. However, the market imperfections and national institutional constraints dictate that variables other than minimizing the cost of capital are often major determinants of debt ratio for affiliates.

Capital structure norms vary widely from one country to another. But various countries also have similar capital structure. Studies have revealed that financial structure of affiliates have relationship with culture (William Sekely and Markham Collins (1988)). It has been found that when countries were grouped on the basis of culture, the firms in the group had the similar debt ratio.

The regional character of the debt ratio was also evident when countries were grouped as per the regional characteristics. Low debt ratios were particular to South East Asia, Latin America and Anglo American group of countries and high debt ratio was particular to Scandinavia, Mediterranean and Indian Peninsula.

Studies also revealed that with in a country neither an industry nor the size were important determinants of debt ratios. However, this contradicts the US based theories that industry is determinant of debt ratio. Comparative studies have revealed that environmental variables are key determinants of debt ratio. Comparative studies have revealed that environmental variables are key determinants of debt ratio. Surveyconducted in US indicated that minimizing the cost of capital is not the main objective of capital structure. The important determinants of capital structure are given below:

(a)   Availability of capital: If capital in the form of debt is available, the financial structure would be in favour of debt.

(b)   Foreign exchange risk: Greater volatility of the domestic currency would induce greater risk perception; therefore local capital structure would emerge.

(c)   Cultural and historical factors also determine the financial structure of a foreign affiliate.

The studies have revealed that for MNCs the minimization of cost of capital is not prime objective of determining the financial structure. There are other objectives also which influence the designing of financial structure.

16.15 NOTES

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16.16 SUMMARY

The cost of capital constitutes an integral part of foreign capital budgeting decisions in that it is to be used as the minimum required rate of return expected to be earned by the proposed investment under consideration. In view of its significance, its correct estimation/ computation is imperative. Like domestic corporate firms, the cost of capital of the multinational corporate enterprise is the weighted average cost (k0) of long-term sources of finance, namely, equity capital, preference capital, borrowed funds (debt) and retained earnings. While retained earnings have implicit/opportunity costs, other long-term sources of finance have explicit costs.

For a multinational group/parent, the determination of cost of capital is more complex than that for local corporate firms; it is to be computed for the group as a whole and also separately for its subsidiaries.

In the context of the parent MNC, in the computation of effective after-tax cost of all the four sources of long-term finance, the finance manager should take into account, exchange risk, flotation costs, tax rates, tax laws (relating to the treatment of exchange losses and gains, withholding, repatriation, amortization of flotation costs, etc.), timing of payment of interest and refund of principal (in the case of debt), transfer costs involved in repatriation of funds to equity holders, rate of inflation, and so on.

The capital structure affects cost of capital. The parent should design its capital structure in such a manner that its overall cost of capital is the minimum. Debt should be used within the sake limits; excessive use may be counter-productive to the very objective of minimizing the overall cost of capital. Tax advantage (due to use of debt) may be more than offset by the greater financial risk which, in turn, causes higher interest costs as well as higher equity costs (i.e. cost of financial distress).

In the context of subsidiaries, in certain situations, there may be reasons to go for a high levered (more debt dominated) capital structure. For instance, in the event of exchange control, it is easier for subsidiaries to remit interest than make payment of dividends on equity, and repayment of debt is also easier than repatriation of equity funds. Above all, existence of political and economic risks pertaining to confiscation of assets (expropriation) may be another important factor to go for more debt. Broadly speaking, there are three alternatives available to the parent for deciding the capital structure of a subsidiary, namely (i) conformance to parent-company norms, (ii) adherence to capital structure norms established in host country, and (iii) inductance of a capital structure which enables the parent to have its cost of capital as minimum. Every approach has its merits and demerits. What

type of capital structure the subsidiary should go for depends on the circumstances and merits of each case.

16.17 KEYWORDS

♦ Beta: Measures responsiveness of changes in the return of an individual security/currency with the change in market return/exchange rate.

♦ Discount Rate: The percentage interest rate used for converting future incomes and costs into current or present values. Usually set equal to the opportunity cost of funds, which is what shareholders could otherwise earn on an alternative investment of equal risk.

♦ Time Value: The part of an option premium that comes from the possibility that an option might have higher intrinsic value in the future than at the moment.

♦ Weighted Average Cost of Capital: The per annum cost of funds raised via debt (bank borrowing, bonds) and equity (selling shares), where the two items are weighted by their relative importance.

♦ Financial Structure Composition of capital raised by a firm- for example, the mix between debt and equity.

♦ Multinational Corporation (MNC) refers to a firm that has business activities and interests in multiple countries.

♦ Optimal Capital Structure That mix of debt and equity capital at which the company has the lowest cost of capital and the lowest level of risk.

♦ Internal Rate of Return (IRR) The discount rate that equates the present value of cash inflows with that of cash outflows.

16.18 SELF ASSESSMENT QUESTIONS

1. What are the problems faced in determining the cost of equity capital compared to other securities? Briefly enumerate approaches to determination of such a cost.

2. The weighted average cost of capital is superior to marginal cost of capital as a discount rate to evaluate capital budgeting of a project. Explain the rationale along with an appropriate example.

3. "If the parent's cost of capital is 12 per cent, its equity investment in a subsidiary therefore is equivalent to 12 per cent." Do you agree? If not, why not?

4.	"We should always borrow in a currency which is likely to devalue as it minimizes financial costs." Do you think it is a good rule of thumb? Explain.

5.	What factors may cause increase in the cost of capital as the debt/equity ratio increases?

6.	What factors should be considered in deciding whether the cost of capital for a foreign affiliate should be higher, lower, or the same as the cost of capital for a comparable domestic operation?

7.	What are some of the advantages and disadvantages of having highly leveraged foreign subsidiaries?

8.	What financing problems might be associated with joint ventures?

9.	Under what circumstances does it make sense for a company to not guarantee the debt of its foreign affiliates?

10.	How can financing strategy be used to reduce foreign exchange risk?

11.	How can financial strategy be used to reduce political risk?

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MODULE – 5
MANAGEMENT OF INTEREST RATE EXPOSURES

UNIT – 17 : INTERNATIONAL CAPITAL BUDGETING AND FRA

Structure:

17.0 OBJECTIVES

After studying this unit, you should be able to;

- Describe nature and issues involved in international capital budgeting decision

- Understand and apply the techniques of evaluating MNCs capital budgeting decisions.

- To understand the concept of FRA and its utilisation in interest rate risk management in international investments.

17.1   INTRODUCTION

Capital budgeting evaluates the investment decisions related to assets. The "capital" in capital budgeting refers to the investment of resources in assets, while the budgeting refers to the analysis and assessment of cash inflows and outflows related to the proposed capital investment over a specified period of time. Objectives of capital budgeting is to;

1. Determine whether or not a proposed capital investment will be a profitable one over the specified time period.

2. To select most profitable & viable investment alternatives.

17.2 INTERNATIONAL CAPITAL BUDGETING

The technique of international capital budgeting is almost similar between a domestic company and an international company. The only difference is that some additional complexities such as foreign currency consideration, exchange rate risk such as transfer pricing and political risk. A capital budgeting at international level is relatively more complex than domestic investment decisions because international firms have to deal with issues related to, exchange rate risks, expropriation risk, blocked funds, foreign tax regulations, political risk and differences between basic business risks of foreign and domestic projects. However, in spite of complex problems of investing abroad, there is an increasing trend to set-up subsidiaries by MNCs and to have direct foreign investment by international firms in other countries. Major motivating factors for undertaking these investments are as follows:

i. Comparative cost advantage favouring foreign investments;

ii. Taxation and other economic financial incentives of investments;

iii. Financial diversification in terms of spreading the firm's risk over a wider range of geographical boundaries.

17.3 COMPLEXITIES OF BUDGETING FOR A FOREIGN PROJECT

Capital budgeting for a foreign project is considerably more complex than the domestic project. Several factors contribute to this complexity:

a) Parent cash flows must be distinguished from project cash flows. Each of these two types of cash flows contributes to a different view of value.

b) Parent cash flows often depend on the form of financing. Thus we cannot clearly separate cash flows from financing decisions, as in domestic investment.

c) The parent must clearly recognize remittance of funds because of differing tax system, legal and political constraints on the movement of funds, local business norms, and differences in the way financial markets and institution function.

d) A range of non nonfinancial payments can generate cash flows from subsidiaries to the parent company, including payment of license fees and payments for imports from the parent company.

e)   Managers must anticipate differing rate of national inflation because of their potential to cause change in competitive position, and thus changes in cash flows over a period of time.

f) Use of host government subsidized loans complicates both capital structure and the parent company's ability to determine an appropriate weighted average cost of capital for discounting purposes.

g) Managers must evaluate political risk because political events can drastically reduce the value or availability of expected cash flows.

Since the same theoretical investment framework is used to choose among competing foreign and domestic projects, it is critical that we have a common standards .Thus all foreign complexities must be quantified as modifications to either expected cash flow or the rate of discount. Although in practice many firms make such modifications arbitrarily, readily available information, theoretical deduction, or just plain common sense can be used to make best investment choices.

17.4 EVALUATION CRITERIA

Non-Discounting Methods:

The methods for evaluating investment proposals are grouped as discounting and non-discounting methods. The non-discounting methods are simple. One such method involves the Average Accounting Rate of Return earned by the project. It represents the mean profit on account of investment prior to interest and tax payment. The mean profit is compared with the hurdle rate or required rate of return. A project is acceptable if the mean profit is higher than the hurdle rate. Despite being a simple method, it has some shortcomings, namely, it is based on the accounting income and not on the cash flow; it considers profit before tax, rather than post-tax profit. And finally, it ignores the time value of money.

Illustration: 1 Find out the accounting rate of return based on the following data:

Solution: The accounting rate of return = 668/8000= 8.35%

The other non-discounting method is known as the pay-back period that is the number of years required to recover the initial investment. If the investment is not recovered within the pay-back period, the project should not be accepted. Thus this method stresses on early recovery of funds, but fails to consider the cash flow after the payback period and so does not consider profitability over the life of the project. It also fails to consider the time value of money. Nevertheless, non-discounting methods are widely used. Buckley (1996) finds that 10 to 20 percent of large US multinationals are reported as using the accounting rate of return method as their primary evaluation technique, while 28 percent have found to have opted payback period method.

Illustration: 2 Consider target payback period as two years, the cash flow of two proposals is as follows:

	Proposal A	Proposal B
Initial investment	$-2000	$-2000
Net cash benefits:		
1st year	1200	1200
2nd year	800	400
3rd year		300
4th year		300

Find which project can be accepted?

Solution: Proposal A will be accepted because the initial investment is recovered within the target payback period despite the fact that proposal B gives a greater return.

Discounting Methods: Discounting methods take normally three forms:

1. Net Present Value Method
2. Profitability index method
3. Internal Rate of Return Method

Net Present Value Method: In this case, projects are accepted where the present value of net cash inflows during the life span of the project is greater than the initial investment. The difference adds to the shareholder wealth. The equation is

$$NPV = \sum_{t=1}^{n} \left[\frac{CF_t}{(1 + k)^n} \right] - I_0$$

Where

CF_t = Expected after tax cash flows,

I_0 = initial investment,

K = risk-adjusted discount rate,

n = life span of the project

Illustration: 3 A projects involve an initial investment of $ 50, 00,000. The net cash inflow during the first, second and the third year is expected as $ 30,00,000, $ 35,00,000 and $ 20,00,000. Respectively at the end of the third year, the scrap value is indicated at $ 10, 00,000. The risk-adjusted discount rate is 10%. Calculate NPV.

Solution:

$$NPV = \frac{30,00,000}{1.10^1} + \frac{35,00,000}{1.10^2} + \frac{20,00,000+10,00,000}{1.10^3} - 50,00,000$$

NPV=28, 73,778

The project would be accepted because NPV is positive.

Profitability Index Method: This shows the relationship between net cash inflows and initial investment. It shows the relative gains and would be expressed as the following equation:

$$PI = \sum_{t=1}^{n} \left[\frac{CF_t / (1 + k)^n}{I_0} \right]$$

Beside the above example, the PI is calculated as

PI= 78, 73,778/50, 00,000= 1.57

The project may be accepted because PI is more than 1.

Internal Rate of Return Method: IRR is a discount rate that makes the NPV of all cash flows from particular project equal to zero. Expressed as equation,

$$\sum_{t=1}^{n} \left[\frac{CF_t}{(1 + IRR)^n} \right] - I_0 = 0$$

The project shall be accepted if IRR is greater than the required rate of return.

Illustration: 4 A proposals involve $20, 00,000. The annual cash flow is $10, 00,000 for three years. Find out the IRR

Solution: Since the initial investment divided by the annuity is 2/1, one has to find out 2 in the annuity table. The annuity factor closest to 2 for three years is 1.9520 at 25% discount rate and 2.1065 at 20% discount rate, the annual cash flow will be multiplied by these two annuity factors and then the difference of the product from the initial outlay is found out it is as follows:

a)   At 20% discount rate: 10,00,000* 2.1065-20,00,000=106.50

b)   At 25% discount rate: 10,00,000* 1.9520-20,00,000=-48.00

Since NPV is greater than 0 at 20% discount rate, one needs a higher discount rate to equate NPV to initial investment

IRR= 20+ (106.50/154.50)*5=23.45%

17.5 FORWARD RATE AGREEMENTS

FRA is a contract on a short term interest rate in which cash flows obligations at maturity are calculated on a national amount and based on the difference between a predetermined forward rate and market rate prevailing on that date. A forward rate agreement (FRA) is an OTC derivative instrument that trades as part of the money markets. It is essentially a forward-starting loan, but with no exchanges of principal, so that only the difference in interest rates is traded. An FRA is a forward-dated loan, dealt at a fixed rate, but with no exchange of principal – only the interest applicable on the notional amount between the rate dealt and the actual rate prevailing at the time of settlement changes hands. So FRAs are off-balance sheet (OBS) instruments. By trading today at an interest rate that is effective at some point in the future, FRAs enable banks and corporate to hedge interest rate exposure, they may also be used to speculate on the level of future interest rates.

Definition: An FRA is an agreement to borrow or lend a notional cash sum for a period of time lasting up to twelve months, starting at any point over the next twelve months, at an agreed rate of interest (the FRA rate). The "buyer" of an FRA is borrowing a notional sum of money while the "seller" is lending this cash sum. This differs from all other money market instruments,In the cash market, the party buying a CD or bill, or bidding for stock in the repo market, is the lender of funds. In the FRA market, to "buy" is to "borrow". Of course, we use the term "notional" because with an FRA no borrowing or lending of cash actually takes place, as it is an off-balance sheet product. The notional sum is simply the amount on which interest payment is calculated.

Example: A company knows that it will need to borrow £1 million in three months' time for a twelve-month period. It can borrow funds today at LIBOR + 50 basis points. LIBOR rates today are at 5% but the company's treasurer expects rates to go up to about 6% over the next few weeks. So the company will be forced to borrow at higher rates unless some sort of hedge is transacted to protect the borrowing requirement. The treasurer decides to buy a 3-v-15 ("threes-fifteens") FRA to cover the twelve-month period beginning three months from now. A bank quotes 5½% for the FRA which the company buys for a notional £1 million. Three months from now rates have indeed gone up to 6%, so the treasurer must borrow funds at 6½% (the LIBOR rate plus spread), however she will receive a settlement amount which will be the difference between the rate at which the FRA was bought and today's twelve-month LIBOR rate (6%) as a percentage of £1 million, which will compensate for some of the increased borrowing costs.

Forward Rates: Forward rate is the interest rate contracted for a future loan therefore it is important to determine the forward rate. Forward rate are estimated on the basis of current terms structure of interest rates. The term structure of interest rates is called yield curve. Yield curves represent the relationship between yield on bonds (of equivalent risk) and their maturities.

Example

Maturity (years)	Yield (%)
1	10.0
2	10.4
3	10.6
4	10.8
5	11.0

Yield curve table

The yield is usually referred to the spot interest rate for a particular maturity period in the above example, a one year spot interest rate is 10%, while a three years spot interest rate is 10.6%.similarly, n-years spot interest rate refers to the annual yield on an investment starting today and lasting n years, with no intermediate cash flows i.e. the principle and interest will be repaid only at the end of n years. The rate of interest implied by zero -coupon bond is commonly called as "Zero rate".

Trading mechanics of FRAs: In virtually every market worldwide, FRAs trade under a set of terms and conventions that are identical. The standard legal documentation to cover FRA trading is used in the market has follows.

♦ **Notional sum:** The amount for which the FRA is traded.

♦ **Trade date:** The date on which the FRA is dealt.

♦ **Settlement date:** The date on which the notional loan or deposit of funds becomes effective, that is, is said to begin. This date is used, in conjunction with the notional sum, for calculation purposes only as no actual loan or deposit takes place.

♦ **Fixing date:** This is the date on which the reference rate is determined, that is, the rate to which the FRA dealing rate is compared.

♦ **Maturity date:** The date on which the notional loan or deposit expires.

- **Contract period:** The time between the settlement date and maturity date.

- **FRA rate:** The interest rate at which the FRA is traded.

- **Reference rate:** This is the rate used as part of the calculation of the settlement amount, usually the LIBOR rate on the fixing date for the contract period in question.

- **Settlement sum**: The amount calculated as the difference between the FRA rate and the reference rate as a percentage of the notional sum, paid by one party to the other on the settlement date.

17.6 CASE STUDY

International Investment Strategies of Wipro

Wipro is planning to start a wholly own subsidiary in Bangladesh to produce and sale Computer. It is planning to invest BDT 60,000,000. The plant would be operational within one year and it would have production capacity of 200,000 units per year and it would continue for 5 year as the company kept a vision for this. The company is expected to sell computer in Bangladesh at a price of BDT 22,000 per unit. Operating cost per unit is BDT 18,000 and Wipro is expecting an opportunity cost of 18% from the new investment. The company has fixed depreciation 20% at straight-line method. The project further also provides following information

- The Company has accumulated balance BDT 2,000,000 in a local bank because of export to Bangladesh. Its withdrawal would attract a tax of 55%.

- Wipro domestic location would provide the Chips for the computer which cost BDT 4000 per piece which has variable cost of production BDT 2600.

- Bangladesh government permits 2% of sales as royalty payment it is tax deductible. This income in India considered as "technology export" and hence in place of 35% tax it would attract 20% tax.

Carry out the appraisal for the project.

17.7 NOTES

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17.8 SUMMARY

International Capital budgeting is a longterm investment decision in the foreign country. there are two broad ctiterias of evaluation of an internatnational investment they are non- discounting and discounting criterias.

FRA is a contract on a short tFRA is a contract on a short term interest rate in which cash flows obligations at maturity are calculated on a national amount and based on the difference between a predetermined forward rate and market rate prevailing on that date. A forward rate agreement (FRA) is an OTC derivative instrument that trades as part of the money markets. It is essentially a forward-starting loan, but with no exchanges of principal, so that only the difference in interest rates is traded.

17.7 KEYWORDS

Capital budgeting, Forward Rate Agreements, Internal Rate of Return Method, Profitability Index Method, Net Present Value Method, Foreign Investment Decisions

17.8 SELF ASSESSMENT QUESTIONS

1. Do you agree that NPV rule is better than the IRR rule for international capital budgeting?

2. How do you compute the cash flow in international capital budgeting?

3. How do you treat the use of blocked funds for calculating the initial cash flow?

4. Write in details the shortcomings of NPV method while evaluating capital budgeting for international project.

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UNIT -18 : INTEREST RATE CAPS, FLOORS AND SWAPS

Structure:

18.0 OBJECTIVES

After studying this unit, you should be able to;

- explain what is a Caps and Floors.

- understand how Caps and Floors are valued and traded.

- discuss the features of an interest rate swaps and its variants.

18.1 INTRODUCTION

The importance of interest rate to modern corporations is due to the frequent cash flows in these corporations which are very pivotal in the equity market, in order to hedge the risk from underlying stock. Stock options are created as means of managing investment risk. In the interest rate market, financial products are termed as interest rate Caps, Floors, and Collars.

18.2 INTEREST RATE CAPS, FLOORS AND COLLARS

Interest rate Caps and Floors are basic products in hedging floating rate risk. They set the minimum return levels on one side of interest rate movement and allow the profit on the other side. Caps and Floors are counterparts to Call and Put options in equity market. They are composition of individual options, called Caplets and Floor lets. By the help of these interest rate derivatives, corporations enjoy much freedom in managing financial assets and liabilities. In conjunction with other financial instruments, Caps and Floors may help remapping the corporations risk structure.

Caps:

A "CAP" is an option contract protecting the buyer from an adverse movement in interest rate, while allowing the buyer to gain from any down hold movement. Caps are referred to as "calls on floating rate" or put options on an underlying time deposit. The holder "exercises" the option if current floating rate exceeds the cap rate or "selling" the relatively low interest rate deposit

A cap transaction is a series of interest options. The buyer of the cap pays an option premium and receives the positive difference between the floating rate and the strike price, cap rate, times the fraction of the year, times the notional principal. The premium is usually quoted as a percentage of notional principal and paid at the origination of the agreement. Settlement can be either in advance or in arrears.

Examples:

IT Ltd. has a subsidiary in the US. This subsidiary wishes to raise US $ 5 Million loan for 7years.The US banks are ready to offer a floating rate of 1.5over LIBOR. The CFO of IT Ltd believes that the $ interest rates may rise and that his US subsidiary cannot afford anything that would push interest costs beyond 10%.One alternative for him would be to pot for a fixed rate loan .But this is feasible only if the US banker are ready to lend on such terms. If they would not lend, the CFO has an alternative .He can buy caps .he can accept the floating rate loan and in addition buy a 10% CAP on interest. This would mean that if LIBOR climbs to beyond 8.5% thereby taking the effective floating rate to beyond 10% .However ,if the LIBOR + Margin is less than 10% ,say 9%,then the lower percentage will be the interest cost that the CFO would pay.

Pricing of such arrangement would vary depending on the circumstance, but one can easily reason out that price for a 12% cap will be lower than the price for a 10% cap, since the chance of interest hike beyond 12% is comparatively high.

Illustration 1

Suppose a firm borrows $ 100,000 for four years at 6-month LIBOR +25 basis points. If the firm fears a raise in LIBOR, it buys IRC for an equivalent amount with the same maturity at a strike price of 7.0 percent which is equal to the prevailing rate. The premium is 0.5 percent for the reset period .If, at the end of the first reset, LIBOR rises to 10.0 percent, and the amount of the interest paid by the borrower will be equal to:

$$ \$ 100,000 \times 10.25\% \times 180 \div 360 = \$ 5,125 $$

Moreover, the borrower will have to pay premium equivalent to:

$$ \$ 100,000 \times 0.005 = \$ 500 $$

On the other hand, the borrowing firm will receive from the bank, that is, from the cap seller, an amount equivalent to:

$$ \$100,000 \times (0.10 \times 0.07) \times 180 \div 360 = \$1,500 $$

As a result of the cap deal, the entire interest rate exposure of the borrower is eliminated. However, the borrowing firm has to pay premium for the cap .But even after taking into account the amount of premium; we find that the interest rate exposure is substantially reduced.

On, contrary to the expectations, LIBOR diminishes at the end of the first reset period or the other reset period, the borrowing firm will have to pay a lower amount of interest but has to pay the premium .The net gain depends upon the extent of change s in LIBOR and the amount of premium .Here, it may be noted that sometimes he premium is paid in the very beginning in a single lump sum amount for the whole of the maturity. In this case, the premium is annualised for the purpose of computing the cost of capped payment. The fixed rate of interest at which the firm could borrow is used in the amortization of the cap premium over the maturity.

Suppose the lump sum premium is 1% for the whole of the maturity of two years (with reset periods) and the fixed rate of interest is 6% annum.

Floors:

A "FLOOR" is an option contract protecting the buyer on the downward movement in interest rate, below the agreed level. The floor transaction is also a series of interest options. The buyer of the floor receives settlement payments only when the floating rate is below the floor rate.

Floors are referred to "puts on floating rate" or call options on an underlying time deposit. The holder "exercises "the option if current floating rate is below the floor rate or "buying" the relatively high interest rate deposit.

Examples:

Suppose a company has concluded a deposit at LIBOR+2% and it is keen that interest rates should not fall below 5% so long as LIBOR is more than 3%, a company will enjoy a rate of LIBOR +2% If LIBOR falls below 3% then company will receive 5%.

Illustration 2

Suppose a firm makes Euro-deposits for $ 100,000 at 6-months LIBOR minus 25 basis points for one year. It fears a fall in LIBOR and so buys an IRF with a strike price of 6.0 percent annum, which is equivalent to the prevailing LIBOR .It pays a lump sum premium at 0.5 percent for whole of the year .As expected, LIBOR moves down to 4.0 percent after the six-month period. If the depositors does not go for IRF ,the bank will compensate this loss. The compensation is computed as

$$\$100,000 \times (0.06-0.04) \times 180 \div 360 = 1,000$$

However, the net gain accruing to the depositor will be lower by the amount of the premium. In this case, the premium, assuming fixed interest rate of 6.0 percent.

Collar:

An interest collar is combination of a cap and a floor, a long position in one and the short position in the other. This combined arrangement places a ceiling on how much interest rate can float above the benchmark rate, and what extent it can float down.

The cost of collar arrangement will be ,lower than a cap since it protects the interest of lender ,as well as those of borrowers .Cost will also depend on the perception of movement of interest rates within the term covered by the collar arrangement.

Example:

An investor enters a collar by purchasing a ceiling with a rate of 10% and sells a floor at 8%. Whenever the interest rate is above 10%, the investor will receive a payment from whoever sold the ceiling. If the interest rate drops to 7%, which is under the floor, the investor must now make a payment to the party that bought the floor

Illustration 3

A firm borrows $ 2.0 million at six-month LIBOR+25 basis points for a period of 2 years, It anticipates a rise in LIBOR and so it goes for (a) buying a cap, and (b) buying a collar, from a bank. The strike rate is 7 %, LIBOR increases during different reset periods respectively to 8.00%, 8.50% and 9.00%. The lump sum premium is 1% for the whole of the three reset periods and the fixed rate of interest is 6% p.a. Find out how far interest-rate risk is hedged through (a) cap and (b) collar.

Solution:

(a)   If the borrower goes for buying a cap

Reset Period	Additional Interest Payment due to rise in Interest Rate	Amount Received from Bank	Premium Paid to Bank	Net Amount Received from Bank
1	10,000	10,000	5,380	4,620
2	15,000	15,000	5,380	9,620
3	20,000	20,000	5,380	14,620
Total	**45,000**	**45,000**	**16,140**	**28,860**

The total interest-rate risk amounts to $ 45,000 which is reduced to $ 16,140 through the cap.

(b)   If the borrower buys a collar :

The borrower receives the premium on the floor and the entire risk is eliminated.

18.3 FINANCIAL SWAPS

A swap is a contractual agreement between two parties to exchange cash flows. The cash flows that are swapped may be determined on the basis of interest rates, exchange rates, or the prices of indexes or commodities.

The salient features of financial swap are that:

♦   It is a combination of forward contracts and it possesses all the properties of a forward contract;

♦   Swap is long term in nature, while forwards are arranged for short period only;

♦   It requires a double coincidence of wants, which is two parties with equal, opposite but matching needs must come into contact with each other; and

♦   There may be a need for a financial intermediary to make the two counterparties meet.

18.3.1   Interest Rate Swap

An interest rate swap is the exchange of a fixed rate loan to a floating rate loan. It has the effect of transforming a fixed rate loan into a floating rate loan or vice versa.

Interest rate swaps (IRS) can be categorized as follows.

a)   **Fixed-to-Floating:** In the fixed-to-floating rate swaps the party pays fixed rate of interest to the bank or swap dealer and in exchange receives a floating rate interest determined on the basis of a reference/benchmark rate at predetermined intervals of time. Such a swap is used by a firm which has floating rate liability and it anticipates a rise in the interest rates. Through the swap the firm will cancel out the receipts and payments of floating rate and have cash outflow based on the fixed rate of interest.

b)   **Floating-to-Fixed:** In this kind of swap the party pays floating rate of interest to the bank or swap dealer and in exchange receives a fixed rate interest at predetermined intervals of time. Such a swap is used by a firm who has fixed rate liability and it anticipates a fall in the interest rates. Through the swap the firm will cancel out the receipts and payments of fixed rate liability and have cash outflow based on the floating rate of interest.

c) **Basis SWAP:** In contrast to the fixed-to-floating or floating-to-fixed where one leg is based on fixed rate of interest, the basis swaps involve both the legs on floating rate basis. However, the reference rates for determining the two legs of payment are different. Basis swaps are used where parties in the contract are tied to one asset or liabilities based on one reference rate and want to convert the same to other reference rate.

18.3.2   Currency Swap

A currency swap involves exchanging principal and fixed rate interest payments on a loan in one currency for principal and fixed rate interest payments on an equal loan in another currency. The counter parties to gain both interest rate exposure as well as foreign exchange exposure, as all payments are made in the counterparty's currency.

Currency swaps may be classified as following:

(a) **Fixed-to-Floating:** In a fixed-to-floating currency swap the interest rate in one of the currencies is fixed while other is floating. For example if the British firm made interest payment in dollar at a fixed rate while receiving pound interest based on London Inter Bank Offer Rate (LIBOR) from the US firm, such a swap would be fixed to floating. Such swaps not only transform the nature of asset/ liability from one currency to another but also change it from fixed rate to floating rate. It becomes a complex tool for hedging against currency risk as well as interest rate risk.

(b) **Floating-to-Floating:** In a floating-to-floating currency swap both the interest rates are floating but in different currencies. For example if the British firm made interest payment in 179dollar based at prime rate in the USA while receiving pound interest based on LIBOR from the US firm, such a swap would be floating-to floating.

Valuation of Swaps:

Pricing of the swap is an important issue for two reasons. First, as stated earlier banks function as warehouse of swaps and are ready to offer swap to the desired customers. For this they are required to quote the swap rates for paying and receiving a fixed rate of interest for receiving/paying the benchmark variable rate. The other reason for valuing the swap is for the purpose of cancellation of an existing swap. For reasons of economy a firm may like to cancel the obligations or part thereof by paying or receiving the value of the swap at that point of time.

Valuing Interest Rate Swap:

As stated earlier, an interest rate swap consists of fixed rate cash flow and floating rate cash flow in the opposite direction, at the time of inception of the swap the present value of these payments must be equal in the opinions of both the parties to the swap else they would not agree to it.

Therefore, at inception the value of swap is zero implying that the present values of cash inflows and outflows are equal and its aggregate flow that is zero.

However, the circumstances would change after the swap is initiated. The value of an interest rate swap at any time is the net difference between the present values of the payments to be received' and the present value of the payments to be made, it becomes positive to one party and is equivalently negative to the other party. This tells how much cash the two parties must exchange to nullify the remaining obligations in the swap. From the valuation perspective a swap transaction may be interpreted in at least two ways. It can be thought of either as a pair of bonds or as a series of forward agreements. Any of the interpretation of the swap helps in its initial pricing as well as its valuation, if and when one wants a premature closure. We take the pricing of swap by both methods by treating the swap as pair of bonds or as a series of forward agreements.

The value of the fixed interest payment leg, $1/a$, is given by Equation 1.

$$V_c = "n_1 \, C_i \, 1 \, (1+ri)^n \, p \, 1(1+ri)^n \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where C_i = Coupon payment at time,

r = Discount rate for period,

n = number of periods remaining; and P= Notional principal amount.

Similarly, we can find the value of the floating rate bond V_f which is equal to present value of the next interest payment and the principal. As we know that the value of the floating rate bond converges to the par value on each payment date, the value of the floating leg can be expressed as Equation 2.

$$V_f = F_1 \, (1+r_1) \, P \, (1+r_1) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where F_1 = Next payment of interest;

r_1= discount rate for period and P= Notional principal amount.

And the value of the swap for one receiving fixed and paying floating will be equal to the differential of the fixed leg and floating rate cash flows given as Equation 3.

| **Value of swap PV of fixed coupon bond - PV of floating rate bond** |

..............(3)

Illustration 4

Assume that the payment of the floating rate determined one period in advance is at the rate of 9.5% (MIBOR was at 8.50% then). The term structure of interest rates as on today is as follows:

1 year: 10%

2 years: 10.5%

3 years: 11%

We find the value of the floating rate bond for an assumed principal payment of Rs 100 by discounting the interest (Rs 9.50) and the principal (Rs100) at 10%.

Value of the floating rate bond = 109.50/1.10 = Rs 99.545

Solution:

The value of fixed rate bond can be found by discounting the three cash flows at the appropriate discount rate given by term structure, would be

Vc 8 = $(1+0.10) + 8 (1+0.105)^2 + 8 (1+0.11)^3 + 100 (1+0.11)^3$

   = 7.273 + 6.552 + 5.849 + 73.119 = Rs 92.793

The value of swap = PV of inflow - PV of out flow

                = 92.793 - 99.545 = - ' 6.752

The present value of inflow of the fixed leg for Firm A is Rs 92.793 and that of floating rate outflow is Rs99.545. The swap can be cancelled if Firm A pays Rs 6.752 now to the counterparty.

Valuing Currency Swap:

We can price currency swap on the same lines and principle as that of interest rate swap, i.e. equating the value of cash inflows with the value of cash outflows, these cash flows are in different currencies, domestic and foreign and need to be converted to the domestic currency, If the present values of cash flows of domestic currency and foreign 191currency are Vd and Vf respectively, and the spot rate is S then the value of the swap, which pays domestic and receives foreign currency, is given by

$Vs = S \times Vf - Vd$

The initial pricing of the swap is set such that the present values of foreign and domestic currency cash flows are equal, and the value of swap is zero. The most common currency swaps involve exchange of principal in the beginning, periodic payment of interest on predetermined interest rates at predetermined intervals, and re-exchange of principal at the end of the swap contract. We have to value these cash flows to know the worth of the swap deal any time subsequent to the contract, as spot rates as well as risk-free rate change.

Illustration 5

A swap was entered by an Indian firm with a bank converting its rupee liability into British pound, where the firm received 10% on Indian rupee and paid 5% on British pound. The amount of principals involved are $ 120 million and £ 1.5 million fixed at the then exchange rate of Rs 80/£. The swap has 4 semi-annual payments to follow. Assume the next payment is due after 6 months from now and term structure in Indian rupee and British pound is flat at 9.00% and 5.50% respectively, for the next 2 years. If the current exchange rate is Rs 82.00/£, what is the value of the swap for the U.S firm and the bank?

Solution:

The semi-annual payment of interest is 0.05 x 120 = $6 million. The final payment would be $126.00 million along with the principal amount. With 9% flat term structure on continuous compounding the present value of the receivable by the firm from the bank would be

PV of $ cash flow = 6.0 x e-0.09*0.5 + 6.0 x e-0.09*1.0 + 6.0 x e-0.09*1.5 + 126.0 x e-0.09*2.0

PV of $ cash flow = 5.7360 + 5.4836 + 5.2423 + 105.2440 = $121.7059 million

PV of rupee cash flow in pound terms = 121.7059/82.00 = £ 1.4848 million

PV of pound cash flow = 0.045 x e-0.055*0.5 + 0.045 x e-0.055*1.0 + 0.045 x e-0.055*1.5 + 1.545 x e-0.055*2.0

PV of pound cash flow = 0.0438 + 0.0426 + 0.0414 + 1.3841 = £ 1.5119 million

PV of pound cast flow in rupee terms = 82.00 x 1.5119 = ' 123.9735

Value of the swap for (in millions)	Firm		Bank	
Dollor leg	- 121.70	- 1.4842	+ 121.71	+ 1.4842
Pound leg	+ 123.97	+ 1.5119	- 123.97	- 1.5119

18.4 SUMMARY

In the interest rate market, financial products are termed as interest rate Caps, Floors, Collars.

A Cap is an option contract protecting the buyer from any adverse movement in interest rate, while allowing the buyer to gain from down hold investment.

Floors are referred to " Puts on floating rate" or call options on an underlying time deposit. The holder " exercises" the option if current floating rate is below the floor rate or "buying" the relatively high interest rate deposit.

Collar is combination of a cap and floor, a long position is one and the short position in the other. This combined arrangement places a ceiling on and how much interest rate can float above the benchmark rate and what extent it can float down.

A Swap is contractual agreement between two parties to exchange cash flows. The cash flows that are swapped may be determined on the basis of interest rates, exchange rates, or the prices of indexes or commodities. There are two broad categories/ Types of financial Swaps they are interest rate Swap and currency Swaps.

18.5 NOTES

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18.6 CASE STUDY

RBI In Foreign Exchange -Rupee Swap Deals

The Reserve Bank of India, in November 2001, partially restored a facility to bank that it had taken away on June 23, 2000, after it found that it was being misused.

The central bank decided to allow banks to undertake foreign currency rupee swap on a matched basis without its prior permission. It also allowed banks to undertake such swaps on an unmatched basis up to $25 million, against $10million earlier.

While undertaking such transaction, banks would only need to inform RBI's exchange control department.RBI put curbs on forex –rupee swaps last year after it came across instances of banks structuring swaps which allowed corporate to repay their external commercial borrowing using the swap route. This was in violation of government regulations.

The Reserve Bank of India then instructed banks to understand all forex-rupee swaps only on a matched basis and with its prior permission.

But treasury officials at banks say only a small relaxation has been made. Before last year's curbs, banks were allowed to undertake all forex-rupee swaps on an unmatched basis. That facility has not been restored .This is only a partial restoration. By putting curbs on this facility that was available to bank, the Reserve Bank of India had effectively killed one of the basis activities of the forex market.

18.7 KEYWORDS

Caps, Floors, Collar, Currency Swap, Interest Rate Swap, Financial Swaps.

18.8 SELF ASSESSMENT QUESTIONS

1.   Explain interest rate swap with suitable example.

2.   What are the characteristics of currency swap?

3.   What are the variants of currency swaps?

4.   Write a note on inters rate caps and floors?

5.   When collars are used. Explain

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UNIT-19: SHORT -TERM FINANCIAL MANAGEMENT

Structure:

19.0 OBJECTIVES

After studying this unit, you should be able to;

- Understand the basics of management of cash, receivable and inventory in a multinational company;

- Know the difference between the working capital management of a multination company and a domestic company.

- Understand the various risks involved in working capital management in case of multinational company.

19.1 INTRODUCTION

Financial managers aim to optimize the return of the firm by minimizing the working capital requirements. Efficient management of Short term financial assets and liabilities like cash, inventories, debtors and creditors etc can minimize working capital requirements. Hence management of Short term financial assets and liabilities is an important function of financial manager.

In the case of International working capital management, the financial manager must give special consideration to political constraints because different governments can block dividend repatriation or other forms of fund remittances. The management of working capital in a multinational firm is similar to a domestic firm except cash management. Both are essentially concerned with selecting that combination of current assets i.e cash, marketable securities, accounts receivable and inventory that will maximize the value of the firm. The basic difference between domestic and international working capital management is the impact of currency fluctuations, different rate of inflation, exchange control, diversity of banking and commercial practices, inter subsidiary transfer of funds, exchange rate risk wider range of short-term financing and investment options available that affects the cash balance. A multinational firm owns a number of enterprises across the globe; it also examines the tax and other consequences of these affiliates. This chapter focuses on Cash management in MNC's, which is a vital part of working capital.

19.2 INTERNATIONAL CASH MANAGEMENT IN A MULTINATIONAL FIRM

The term cash management can be broadly defined to mean optimization of cash flows and investment of excess cash. From an international perspective, cash management is very complex because laws pertaining to cross-border cash transfers differ among countries. In addition, exchange rate fluctuations can affect the value of cross-border cash transfers. Financial managers need to understand the advantages and disadvantages of in- vesting cash in foreign markets so that they can make international cash management decisions that maximise the value of the MNC.

International cash management is wider in scope and is more complicated as compared to domestic cash management because it has to consider the principles and practices of other countries. The cash management is mainly concerned with the cash balances, including marketable securities, are held partly to allow normal day-to-day cash disbursements and partly to protect against un-anticipated variations from budgeted cash flows. These two motives are called the transaction motive and precautionary motive. Cash disbursement for operations is replenished from two sources:

♦ Internal working capital turnover

♦ Short-term borrowings

The efficient cash management is mainly concerned with to reduction of cash tied up unnecessarily in the system, without diminishing profit or increasing risk so as to increase the rate of return on capital employed. The main objectives of cash management are:

i. To manage and control the cash resources of the company as quickly and efficiently as possible.

ii. To achieve the optimum utilisation and conservation of cash.

The first objective of international cash management can be achieved by improving the cash collections and disbursements with the help of accurate and timely forecast of the cash flow. The second objective of international cash management can be achieved by minimising the required level of cash balances and increasing the risk adjusted return on capital employed.

Both the objectives mentioned above conflict each other because minimising transaction costs of currency conversion would require cash balances to be kept in the currency in which they have been received which conflicts with both the currency and political exposure criteria

19.3 TECHNIQUES OF OPTIMISE CASH FLOW MOVEMENTS

Accelerating collection and decelerating disbursements is a key element of international cash management. Material potential benefits exist because long delays are often encountered in collecting receivables, and in transferring funds among affiliates and corporate headquarters. In international cash management, with the help of following ways, the cash inflows are being optimised.

i. Accelerating Cash Inflows:

The first goal in international cash management is to accelerate cash inflow; several managerial practices are advocated for this endeavour, some of which may be implemented by the individual subsidiaries;

First a corporation may establish lockboxes around the world. Lockboxes are the post office boxes to which customers are instructed to send payments. A bank usually processes incoming cheques at a lockbox on a daily basis.

Second, cash flows can be accelerated by using preauthorised payments, which allow a corporation to charge a customer's bank account up to some limit.

ii. Managing blocked funds:

Cash flows can be affected by host government's blockage of funds. The government may require all funds to remain within the country by investments in various proposals. The blockage may be only temporary, or it may be for a considerable period of time. A lengthy blockage is detrimental to a MNC. Without the ability to repatriate profits from a foreign subsidiary.The MNC might as well not even have the investment as returns are not being paid to the stockholders of the MNC. Prior to making a capital investment in a foreign subsidiary, the parent firm should investigate the potential of future funds blockage. Unexpected funds blockage after an investment has been made, however, is a political risk with which the MNC must contend. Thus, the MNC should be familiar with methods of moving blocked funds so as to benefit its stockholders.

Example:

To make efficient use of these funds, the MNC may instruct the subsidiary to set up a research and development division, which incurs costs and possibly generate revenues for other subsidiaries. A host government may then be more lenient on funds sent to cover expenses than on earnings remitted to the parent.

iii. Leading and lagging strategy:

The leading and lagging strategies can make efficient use of cash and there by reduces debt. Leading is a strategy where the payment is made before the goods are purchased between the subsidiaries. Lagging is a strategy where the payment is delayed even after the goods are purchased between the subsidiaries. Some host governments prohibit the practice by requiring that a payment between subsidiaries occur at the time the goods are transferred. Thus, an MNC needs to be aware of any laws that restrict the use of this strategy.

iv. Netting to reduce overall transaction costs

Netting is a technique of optimising cash flow movements with the combined efforts of subsidiary or by the centralized cash management group. This technique optimizes cash flows by reducing the administrative and transaction cost that result from currency conversion.

Example:

Montana. Inc., has a subsidiaries located in France and Hungary. Whenever the French subsidiary wants to purchase from Hungarian subsidiary, it needs to convert Euros into Hungary's Forint to make payment and vice versa. Instead, Montana Inc., has instructed both subsidiaries to net their transaction on a monthly basis so that only net payments is made at the end of each month

v. Minimising the tax on cash flow through international transfer pricing:

Within a large business firm with multiple divisions, goods and services are frequently transferred from one division to another investment, This process expects that should be assigned, for bookkeeping purposes, to the goods or services as they are transferred between divisions, obviously, the higher the transfer price, the larger will be the gross profits of the transferring division relative to the receiving division. Even within a domestic firm, it is difficult to decide on the transfer price. Within a MNC, the decision is further compounded by exchange restrictions on the part of the host country where the receiving affiliate is located. A difference in income tax rates between the two countries, and import duties and quotas imposed by the host country.

vi. Investing Surplus Cash:

The other important function of international cash management is investing surplus cash in other investment avenues, the market helps in investing and accommodating excess cash in the international money market. Investment in foreign markets has been made

much simpler and easier due to improved telecommunication systems and integration among money markets in various countries.

19.4 CENTRALISATION OF CASH MANAGEMENT SYSTEM

Centralisation of cash management refers to centralisation of information, reports and decision-making process as to cash mobilisation, movement and investment of cash. Centralised cash management system will benefit the multinational firm in the following ways:

- Maintaining minimum cash balance during the year.

- Helpful to generate maximum possible returns by investing all cash resources.

- To manage the liquidity requirements of the centre.

- Helpful to take complete benefits of bilateral netting and multilateral netting for reducing transaction costs.

- Helpful in utilising the various hedging strategies to minimise the foreign exchange exposure.

- Helpful to get the benefit of transfer pricing mechanism to enhance the profitability of the firm.

With a centralized cash depository, excess cash is remitted to the central cash pool. Analogously, the central cash manager arranges to cover shortages of cash. The central cash manager has a global view of the MNC's overall cash position and needs. Consequently, there is less of a chance for misallocated funds; that is, there is less chance for funds to be denominated in the wrong currency. Moreover, because of his global perspective, the central cash manager will know the best borrowing and investing rates. A centralized system facilitates funds mobilization, where system wide cash excesses are invested at the most advantageous rates and cash shortages are covered by borrowing at the most favourable rates. Without a centralized cash depository, one affiliate might end up borrowing locally at an unfavourable rate, while another investing temporary surplus funds locally at a disadvantageous rate.

19.5 DE-CENTRALISATION OF CASH MANAGEMENT SYSTEM

Under a decentralized cash management system, each affiliate would hold its own transaction balance and precautionary cash. Each affiliate will continue to hold sufficient cash to cover its expected cash transactions,. In the event one of the affiliates experiences a cash shortage, funds are wired from precautionary cash held in the central cash pool. Each affiliate enjoys the autonomy and flexibility in decision making.

Illustration 1: Given the following data about the cash requirements of an MNC and its affiliates

Location	Average Expected cash needs(Mean)(Millions)	Risk(Standard deviation)(Millions)
Parent	450	50
Affiliate X	85	25
Affiliate y	130	36
Affiliate z	90	25

Assuming that the MNC wishes to ensure that all cash needs of the parent and the affiliate can be met on time;

a) How much cash would be needed by each entity under a decentralised cash management system?

b) How much savings would accrue from a centralised system Show how these saving are possible.

Solution:

Location	Average Expected cash needs (Mean) (Millions)	Risk (Standard deviation) (Millions)	Cash Requirement Minimum	Cash Requirement Maximum
Parent	450	50	400	500
Affiliate X	85	25	60	110
Affiliate Y	130	36	94	166
Affiliate Z	90	25	65	115
Total	755		619	891

Under decentralised system, to ensure that all the affiliates and the parent have sufficient cash available to meet the cash needs in time, the parent and the subsidiary will maintain the maximum level of cash required and hence the firm as a whole would require 891 million.

On the other hand under centralised system since cash are pooled at teh central depository, it would be sufficient if the subsidiaries and the parent maintain minimum level of cash needs that totals to 619 million.

Thus, the firm has a whole would save 200 million. This amount can be kept with central depository which can invest the excess cash in order to generate returns on the idle cash.

19.6 CASE STUDY

Efficient Funds Flow at Eastern Trading Company

The Eastern Trading Company of Singapore purchases spices in bulk from around the world, packs them into consumer-size quantities, and sells them through sales affiliates in Hong Kong, the United Kingdom, and the United States. Far a recent month, the following payments matrix of inters affiliate cash flows, stated in Singapore dollars, and was forecasted. Shows how Eastern Trading can use multilateral netting to minimize the foreign exchange transactions necessary to settle inter affiliate payments. If foreign exchange transactions cost the company .5 percent, what savings result from netting?

Eastern Trading Company Payments Matrix (S$000)

Receipts	Singapore	Hong Kong	U.K.	U.S.	Total Receipts
Singapore	—	40	75	55	170
Hong Kong	8	-	-	22	30
U.K.	15	-	-	17	32
U.S.	11	25	9	-	45
Total disbursements	34	65	84	94	277

19.7 NOTES

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19.8 SUMMARY

Management of working capital in a multinational firms is similar to a domestic firms except cash management. From an international perspective cash management is very complex because loans pertaining to cross – border cash transfers differ among countries. In addition exchange rate fluctuations can affect the value of cross – border cash transfers. The efficient cash management is mainly concerned with to reduction of cash tied up unnecessarily in the system, The cash management's main objectives are, the first manage and control the cash recourses of the company as quickly and efficiently as possible. The second is to achieve the optimum utilization and conservation of cash . To achieve these objectives there are many techniques, they are accelerating cash flows, managing blocked funds, leading and lagging strategy, netting to reduce overall transaction costs, minimizing cash flows through transfer pricing, investing surplus cash.

Centralisation of cash management refers to centralization of information, reports and decision- making processes to cash mobilization,movement and investment cash. Whereas under a decentralized cash management system, each affiliate would hold its own transaction balance and precautionary cash.

19.9 KEYWORDS

Cash management, centralized cash depository, netting, precautionary cash balances, 467 transaction balances, transfer price.

19.10 SELF ASSESSMENT QUESTIONS

1. Describe the key factors contributing to effective cash management within a firm. Why the cash management process in a MNC is is more critical?

2. Discuss the pros and cons of a MNC having a centralized cash manager to handle all investment and borrowing for all affiliates of the MNC versus each affiliate having a local manager who performs the cash management activities of the affiliate.

3. How might a MNC use transfer pricing strategies? How do import duties affect transfer pricing policies?

4. What are the various means the taxing authority of a country might use to determine if a transfer price is reasonable?

5. Discuss how a MNC might attempt to repatriate blocked funds from a host country.

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UNIT -20 : NETTING, TRANSFER PRICING AND GDR

Structure :

20.0 OBJECTIVES

After studying this unit, you should be able to;

- discuss how funds move intra-firm when the host government impose restrictions on outflow of funds.

- analyse the different types of pricing policies when goods transfer from one branch to another.

- discuss the role of GDR's in international capital management.

20.1 INTRODUCTION TO NETTING

Netting is a technique of optimising cash flow movements with the joint efforts of subsidiaries and is typically used by companies with a number of affiliates in different countries. Netting allows parties to reduce their exposures and consequently reduce their risk. This allows capital to be used more efficiently. Netting is widely used in financial markets, around the world, as a means of lowering the risk to which bank and other large institutions are exposed. Netting allows companies to reduce bank fees, currency conversion costs, bank balance and reduce operational costs.

A netting agreement is a contract where by each party agrees to set off amounts it owes against amounts owed to it. The process involves the reduction of administration and transaction costs those results from currency conversion. Netting as a technique of optimising cash flows, has become important in the context of a highly coordinated international interchange of materials, parts and finished products among the various units of the MNCs with many affiliates both buying from and selling to each other. There are definite costs associated with cross border fund transfers including the costs of purchasing and conversion of foreign exchange. Netting helps in minimising the total volume of inter-company fund flow.

The various advantages of a netting system are

1. It reduces the number of cross-border transactions between subsidiaries, thereby reducing the overall administrative cost of such transfer

2. There is a coordinated and disciplined effort among all the subsidiaries to accurately report and settle various accounts.

3. The technique reduces the need for foreign exchange conversion and hence reduces transaction costs associated with foreign exchange conversion.

4. It helps in improved cash flows forecasting since only net cash transfers are made at the end of each period.

5. Netting of cash flows or obligations is a means of reducing credit exposure to counter parties.

20.2 TYPES OF NETTING

Netting arrangements can be either bilateral (between two parties) or multilateral (involving several parties)

♦ **Bilateral Netting System:**

A bilateral netting system is an agreement between two parties to exchange only the net difference between what each owes to other. The basic objective is to reduce exposure to credit and settlement risk. In a bilateral netting system, two counter parties agree to net with one another. They sign a master agreement specifying the types of netting to be performed as well as the existing and future contracts which will be affected. A bilateral netting system involves transactions between the parent and a subsidiary or between two subsidiaries. Bilateral netting is common in the OTC derivative market.

Example 1:

If subsidiary A purchases $20 million worth of goods from subsidiary B and B in turn, buys $ 21 million worth of goods from A, then the combined flow will add up to $41 million. But in a bilateral netting system, subsidiary A would pay subsidiary B only $1million.

Example 2:

The US parent and German affiliate have to receive net $40,000 and $30,000from one another. Then under a bilateral netting system, only one payment will be made ie., the German affiliate pays the US parent an amount equal to $10,000.

Before Netting

The US parent has to pay net $40,000 to German affiliate

The German affiliate has to pay net $30,000 to US parent

After Netting

The German affiliate pays the US parent an amount equal to $10,000.

Thus bilateral netting reduces the number of foreign exchange transactions and hence also the costs associated with foreign exchange conversion.

However, bilateral netting is also of limited use when there is more complex interchange among the parent and several subsidiaries. In such a situations the MNC establishes a multilateral netting system.

20.3 MULTILATERAL NETTING SYSTEM

Multilateral netting occurs between multiple counter parties. Under a multilateral netting system, each affiliate nets all its inter affiliates receipts against all its disbursements. It then transfers or receives the balance, depending on whether it is a net receiver or a net payer. A multilateral netting system involves a more complex inter change among the parent and its several affiliates but it results in a considerable saving in exchange and transfer costs. However, a multilateral netting system, to be really effective needs the service of a centralised communication system and discipline on the part of subsidiaries involved. Such a system is usually needed so that all necessary information is consolidated and from the consolidated cash flow information, net cash flow positions for each pair of subsidiaries can be determined. Many MNCs have found that they can eliminate approximately 50% or more of their intercompany transactions through multilateral netting.

Multilateral netting has the advantage that it reduces credit exposure even more than bilateral netting. It has the disadvantage that it tends to mutualise credit risk. Because credit exposure to each counter party is spread across all participants, there is less incentive for each participant to scrutinize the credit worthiness of each other counter party.

Example:

In these examples US parent company has subsidiaries in France, Canada, UK and Japan. The amounts due to and from the affiliate companies is converted in to a common currency US dollar and entered into the matrix. The French subsidiary owes the Canadian subsidiary $60,000, the UK subsidiary $80,000 and the Japanese subsidiary $100,000. As against this, for the same period, the French subsidiary is due to receive $ 40,000from the Canadian subsidiary,$60,000 from the UK subsidiary and $100,m000 from the Japanese subsidiary. In the same manner inter subsidiary payment matrix is described below.

Illustration 1

	Payment affiliate				
	FRANCE	**CANADA**	**UK**	**JAPAN**	**TOTAL**
FRANCE	-	40	60	100	200
CANADA	60	-	40	80	180
UK	80	60	-	70	210
JAPAN	100	30	60	-	190
TOTAL	240	130	160	250	780

Solution:

Netting Schedule

	Receipts	Payments	Net Receipts	Net Payments
FRANCE	200	240	-	40
CANADA	180	130	50	-
UK	210	160	50	-
JAPAN	190	250	-	60

Since the subsidiaries owe one another it will be economical if only net payments are made. The Currency conversion costs can also be significantly reduced with the help of netting. Without netting, the total payments would equal $780 thousands. Multilateral netting reduces these transfers to $100 thousands, a net reduction of 87%.

20.4 REQUIREMENTS MULTILATERAL NETTING SYSTEMS

In 1990, the bank of international settlements issued minimum standards for the design and operation of netting schemes. They are now known as Lamfalussy standards after the chairman of the committee that wrote the report, Mr. Alexandre Lamfalussy. The six standards are

1. Well founded legal basis under all relevant jurisdiction.

2. Participants have clear understanding of system on each of the risks affected by the netting process.

3. System should have clearly defined procedures of management of credit and liquidity risks that specify the responsibilities of the system and the participants.

4. System capable of on time completion of daily settlements even if the participant with the largest position fails.

5. System should have objective and disclosed criteria for admission that permit fairand open access.

6. System must ensure operational reliability of systems and availability of back-up facilities.

20.5 TRANSFER PRICING

In a large organisation with multiple divisions, goods and services are frequently transferred from one division to another. In case of inter divisional transfers; the problem of transfer prices becomes important. The profits of various divisions are determined by the price that will be charged by the transferring division and the receiving division. Higher the transfer price, the larger will be the gross profit of the transferring division relative to the receiving division. Even for a domestic firm, it is quite difficult to decide on the transfer price. Within a MNC, the decision is further complicated by exchange restrictions, difference in tax rates between the two countries, inflation differentials, import duties and quotas imposed by the host country.

Illustration 2:

     ABC Co has a subsidiary in Country X that produces computer components and sells them to another subsidiary in Country Y where the production process is completed. The tax rate in country X is 50% while the tax rate in country Y is 20% . The income statement of ABC Company is shown below. Now assume that ABC Co. adjusts its transfer pricing policy so that sales by subsidiary X are reduced from $400,000 to $320,000. Determine the change in total tax payments of the consolidated subsidiaries as a result of this revised transfer pricing policy.

Particulars	Subsidiary X	Subsidiary Y	Consolidated Subsidiaries
Sales	4,00,000	7,00,000	11,00,000
less cost of goods sold	2,20,000	4,00,000	6,20,000
gross profit	1,80,000	3,00,000	4,80,000
less operating expenses	80,000	1,00,000	1,80,000
EBIT	1,00,000	2,00,000	3,00,000
Interest	10,000	30,000	40,000
EBT	90,000	1,70,000	2,60,000
Tax (50%for X and 20% for Y)	45,000	34,000	79,000
EAT	45,000	1,36,000	1,81,000

Solution: The sales level for subsidiary X matches the cost of goods sold for subsidiary Y, implying that the entire subsidiary X sales is to subsidiary Y. When the sales by subsidiary X are reduced from $4, 00,000 to $ 3, and 20,000 to subsidiary Y, this would also affect the cost of goods sold to subsidiary Y by the same amount.

Income Statement Based On Revised Transfer Policy

Particulars	Subsidiary X	Subsidiary Y	Consolidated Subsidiaries
Sales	3,20,000	7,00,000	10,20,000
less cost of goods sold	2,20,000	3,20,000	5,40,000
gross profit	1,00,000	3,80,000	4,80,000
less operating expenses	80,000	1,00,000	1,80,000
EBIT	20,000	2,80,000	3,00,000
Interest	10,000	30,000	40,000
EBT	10,000	2,50,000	2,60,000
Tax (50%for X and 20% for Y)	5,000	50,000	55,000
EAT	5,000	2,00,000	2,05,000

The total taxes have been reduced from $79,000 to $55,000 as a result of the revised transfer pricing policy. However, there may be some limitations to such an adjustment in the transfer pricing policy since host governments may enforce laws that restrict such practices where the intention is to avoid taxes.

To deal with high taxation, financial strategies can also be used. For example, the parent of subsidiary ABC may provide only minimal financial support to subsidiary X thereby forcing it to borrow and incur annual interest expenses. When the tax rates are high, debt is an attractive source of funds. The parent in this situation may force subsidiary X to borrow funds than needed and channel funds to subsidiaries in other countries. Subsidiary X would receive the largest tax benefit from the borrowing because of higher tax rate.

The above mentioned strategy clearly highlights how the high tax subsidiary is subsidising other subsidiaries. Such a strategy reduces the subsidiary's profits but increases the overall cash flow for the MNC. Some host governments may attempt to prevent MNC's from implementing such a strategy.

20.6 GLOBAL DEPOSITORY RECEIPT'S

Introduction

Increased globalization and investor appetite for diversification, offer a unique opportunity to companies looking to tap a new investor base, awareness or raise capital. Indian companies are allowed to raise equity capital in the international market through the issue of GDR/ADR/FCCB/FCEB.

Meaning-Depository Receipts

Negotiable certificate issued by one country's bank against a certain number of shares held in its custody but traded on the stock exchange of another country. GDRs entitle the shareholders to all associated dividends and capital gains, and can be bought and sold like other securities. Thus they allow investors in any country to buy shares of any other country without losing the income or trading flexibility. Also called European depository receipt (EDR) or international depository receipt (IDR).

The Global Depositary Receipt as a Financial Instrument

a)   A GDR is issued and administered by a depositary bank for the corporate issuer. The depositary bank is usually located, or has branches, in the countries in which the GDR will be traded. The largest depositary banks in the United States are JP Morgan, the Bank of New York Mellon, and Citibank.

b) A GDR is based on a Deposit Agreement between the depositary bank and the corporate issuer, and specifies the duties and rights of each party, both to the other party and to the investors. Provisions include setting record dates, voting the issuer's underlying shares, depositing the issuer's shares in the custodian bank, the sharing of fees, and the execution and delivery or the transfer and the surrender of the GDR shares.

c) A separate custodian bank holds the company shares that underlie the GDR. The depositary bank buys the company shares and deposits the shares in the custodian bank, and then issues the GDRs representing an ownership interest in the shares. The DR shares actually bought or sold are called depositary shares.

d) The custodian bank is located in the home country of the issuer and holds the underlying corporate shares of the GDR for safekeeping. The custodian bank is generally selected by the depositary bank rather than the issuer, and collects and remits dividends and forwards notices received from the issuer to the depositary bank, which then sends them to the GDR holders. The custodian bank also increases or decreases the number of company shares held per instructions from the depositary bank.

e) The voting provisions in most deposit agreements stipulate that the depositary bank will vote the shares of a GDR holder according to his instructions; otherwise, without instructions, the depositary bank will not vote the shares.

GDR Market

As derivatives, depositary receipts can be created or cancelled depending on supply and demand. When shares are created, more corporate stock of the issuer is purchased and placed in the custodian bank in the account of the depositary bank, which then issues new GDRs based on the newly acquired shares. When shares are cancelled, the investor turns in the shares to the depositary bank, which then cancels the GDRs and instructs the custodian bank to transfer the shares to the GDR investor. The ability to create or cancel depositary shares keeps the depositary share price in line with the corporate stock price, since any differences will be eliminated through arbitrage.

The price of a GDR primarily depends on its depositary ratio (DR ratio), which is the number of GDRs to the underlying shares, which can range widely depending on how the GDR is priced in relation to the underlying shares; 1 GDR may represent an ownership interest in many shares of corporate stock or fractional shares, depending on whether the GDR is priced higher or lower than corporate shares.

Most GDRs are priced so that they are competitive with shares of like companies trading on the same exchanges as the GDRs. Typically, GDR prices range from $7 - $20. If the GDR price moves too far from the optimum range, more GDRs will either be created or cancelled to bring the GDR price back within the optimum range determined by the depositary bank. Hence, more GDRs will be created to meet increasing demand or more will be cancelled if demand is lacking or the price of the underlying company shares rises significantly.

Most of the factors governing GDR prices are the same that affects stocks: company fundamentals and track record, relative valuations and analysts' recommendations, and market conditions. The international status of the company is also a major factor.

On most exchanges, GDRs trade just like stocks, and also have a T+3 settlement times in most jurisdictions, where a trade must be settled within 3 business days of the trading exchange.

The Stock Exchanges Trading GDR's are:

1. London Stock Exchange

2. Luxembourg Stock Exchange

3. NASDAQ Dubai

4. Singapore Stock Exchange

5. Hong Kong Stock Exchange

20.7 CASE STUDY

<u>Transfer Pricing Is the Most Important International Tax Issue</u>

Transfer pricing is the most important international tax issue that multinational enterprises (MNEs) now face, according to a new survey by Ernst & Young. Eighty-six percent of MNE parent company respondents and 93 percent of subsidiary respondents to the Ernst & Young Transfer Pricing 2003 Global Survey identified transfer pricing as the most important international tax matter they are currently dealing with, and indicated that audits by tax authorities are becoming a rule, rather   than an exception. Transfer pricing involves the price at which transactions between units of multinational companies take place, including the inter-company transfer of goods, property, services, loans and leases.

The Ernst & Young Survey revealed that 59 percent of all MNEs with revenues of US$5 billion or more, and 71 percent of all US-based MNEs regardless of revenues, had been subject to a transfer pricing audit somewhere in their organization since 1999. Seventy- six percent of all company respondents total Ernst & Young that they "believe that a transfer pricing examination will occur within their group during the next two years."According to Ernst & Young, MNEs believe that the chance of being subjected to a transfer pricing audit is increasing because more and more countries are adopting transfer pricing legislation; those that already have legislation are stepping up their enforcement efforts. Moreover, audits will become more challenging because, according to survey participants, revenue authorities are more sophisticated. Tax authority feedback reinforced this observation, as many countries indicate they are investing more in training and encouraging their examiners to use all the examination tools available, reports Ernst & Young.

The survey indicated that if an MNE is subject to an adjustment as the result of a transfer pricing examination, there is almost a one-in-three chance that it will be threatened with a penalty, and a one-in-seven chance that one will actually be imposed. Ernst & Young expects these rates to increase as countries, including the United States, step up compliance and penalty enforcement.

In addition, the Survey revealed that 40 percent of the reported transfer pricing adjustments result in double taxation. "This figure is alarmingly high, but perhaps lower than might be expected, given that only 19 percent of reported cases with adjustments were appealed," said Robert D. M. Turner, Global CEO of Ernst & Young's Transfer Pricing Services. "Of the appeals actually made by parent MNEs, 51 percent involved the competent authority process, 26 percent went to court and seven percent sought arbitration," said Mr. Turner.

The Ernst & Young survey found that MNE experiences with the competent authority process, which is a tax treaty process under which two governments agree to resolve the issue, vary. In many cases, although the competent authority process may take a year or two to reach resolution, the authorities eliminate or reduce the double taxation. Those MNEs who have used the competent authority process generally appear to have had a favourable experience, as most would go to competent authority again or even consider an Advance Pricing Agreement.

The survey also revealed that many multinationals failto re-examine their transfer pricing policies in the wake of mergers or acquisitions. "Because of the increasing scrutiny of transfer pricing policies, it is essential for an MNE to review the impact of

any business change on its risk profile. In many cases, this will highlight the multinational's need to re-design core elements of its transfer pricing policies," according to Mr. Turner.

Mr. Turner also pointed out that while nearly half (46%) of the survey's Parents respondents had been through a merger or acquisition in the last two years, "only 18 percent of these MNEs either recognized the need or used the opportunity to re-examine their overall transfer pricing policies. In fact, almost half of the survey respondents who went through a business combination simply used the transfer pricing policies of the dominant player in the transaction, thereby potentially missing legitimate planning opportunities. Moreover, a failure to adjust transfer pricing following major business changes may leave an MNE exposed when the years in question come up for review."

According to the Survey report, the sale of tangible goods remains the most commonly audited transaction among MNEs. The percentage of audits of tangible goods transactions is decreasing, however, while the percentage of audits relating to service and intangible property transactions is increasing.

Mr. Turner observed that "intercompany services are becoming a much larger part of the 'services economy' and we are seeing services transactions with larger monetary value. Despite this, MNEs tend to shy away from documenting these types of transactions, as they consider administrative or managerial services and financing transactions to be de minimise. With no or minimal documentation, these transactions appear to be the weakest link in an MNE's transfer pricing shield, giving revenue investigators more room to propose an adjustment."

Source: Ernst & Young, November 5, 2003, reprinted with permission of LexisNexis.

20.8 NOTES

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20.9 SUMMARY

A netting is a contract where by each party agrees to set off amount it owes against amount owed to it. The process involves the reduction of administration and transaction costs those results from currency conversion. There are two types in Netting, first is bilateral netting system and second is unilateral netting system.

The transfer pricing is an important determination of the profitability of an MNC. A transfer price is the price at which divisions of a company transact with each other, such as the trade of supplies or labor between departments/ subsidiaries.

The Indian companies are allowed to raise equity capital in the international market through the issue of GDR/ADR/ FCCB/ FCEB. The global depository receipt is a negotiable certificate issued by one country's is bank against a certain number of shares held in its custody but traded on the stock exchange of another country.

20.10 KEY WORDS

Bilateral netting, cash budget, cash management, centralized cash depository, multilateral netting, netting centre, precautionary cash balances, transaction balances, transfer price.

20.11 SELF ASSESSMENT QUESTIONS

1. Describe the key factors contributing to effective cash management within a firm.

2. How might a MNC use transfer pricing strategies? How do import duties affect Transfer pricing policies?

3. What are the various means the taxing authority of a country might use to determine? If a transfer price is reasonable.

4. Discuss how a MNC might attempt to repatriate blocked funds from a host country.

20.12 REFERENCE

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