Block

4

INTERNATIONAL FINANCE AND RISK MANAGEMENT

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BLOCK 4: INTERNATIONAL FINANCE AND RISK MANAGEMENT

A finance manager's area of operations is no more restricted to the domestic markets in this era of internalization when the pricing of inputs and end products is dependent on various global parameters with the increase in trade among different countries, integration of financial markets and emergence of well-developed global financial system, it is essential for the finance manager to develop an understanding of the international business environment. Knowledge about International Finance, International Trade and the appraisal criteria for International projects is a precursor to operate in this environment. Also required is awareness about the risks inherent in global operations and the instruments that are available for managing such risks. This block covers *international project appraisal, international trade and finance and financial risk management.*

Unit 17: *International Project Appraisal,* discusses the financial appraisal of international projects. Since companies seek funds for their projects or invest in foreign physical assets for a number of reasons, it is imperative that an estimate is made on the viability of the referred project and also compute the expected returns from such projects. The viability of the project is to be judged both for the cash flows it is expected to generate, as well as for the associated risk.

Unit 18: International Trade: Theories and Practices, describes the international business environment within which transactions are to be conducted. Adequate knowledge of how international markets work, how exchange rate between the different currencies determine the international transactions and related risk in such transactions is essential in today's world since pricing of various commodities are dependent on global supply and demand and indirectly impact businesses of all companies in the era of globalization.

Unit 19: Financial Risk Management, explains in detail the risks associated with international trade operations and the risk management techniques that a business should employ to mitigate and manage such risks. Any business operating in local as well as foreign markets requires an adequate understanding of related risks and the approaches to manage them failing which their revenues may be adversely affected.

Unit 17

International Project Appraisal

Structure

"No matter how good the team or how efficient the methodology, if we're not solving the right problem, the project fails."

— *Woody Williams*

17.1 Introduction

International Projects are appraised on techno, economic viability parameters to assess the expected returns from such projects vis-à-vis the costs associated with the projects. Project appraisal is a preliminary and essential step done by the funding agency to assess the actual requirement of funding for these projects. Hence it is necessary to know the evaluation techniques that can be used for making financial appraisal of projects as also the funding sources available.

India, after its financial reforms in 1991, is emerging as one of the most favored destinations for investment in international projects. On the other side Indian companies are on expansion spree and looking for greener pastures for establishing their manufacturing and servicing units across globe. In this context, the specific avenues available for foreign investors in India for investment and the government's policy are to be discussed for arriving at beneficial project decisions.

In the previous unit, we discussed cash management models. In this unit, we will discuss the various aspects related to appraisal of international projects.

17.2 Objectives

After reading through the unit, you should be able to:

- Explain the significance of project appraisal for undertaking viable international projects
- State how project appraisal is a pre-requisite for deciding the sources of funding for international projects
- Describe the evaluation of international projects on the basis of the future cash inflows
- Build awareness about foreign investments in India (FDI) and the government initiatives to promote FDI inflows

17.3 Meaning of Project Appraisal

A project is a group of unique, inter-related activities that are planned and executed in a certain sequence to create a unique product and/or service, within a specific time frame, budget, and the client's specifications.

The British Standard 6079 of 1996 (BS6079) defines a project as, "a unique set of coordinated activities, with definite starting and finishing points, undertaken by an individual or organization to meet specific objectives within defined schedule, cost, and performance parameters."

International projects are those projects that go beyond national boundaries either in terms of the project purpose or the nationality of stakeholders. International projects are not different from the standard domestic projects; however, they possess certain unique features such as complexity, diversity, risk, larger resources and prone to international political and economic conditions.

A project is conceptualized through several brain storming sessions. Once the project idea is generated it undergoes preliminary screening before arriving at the appraisal stage. Initial screening is a process of rejection rather than a process of selection. The objective is to reject those ideas that cannot be considered for implementation.

A project appraisal is a process undertaken to assess the feasibility of the project. One of the primary objectives for undertaking project appraisal is to understand the likely consequences of an investment. It involves analyzing the risks associated to decide whether the project can or cannot be implemented. Project appraisal is an integral component of any type of project – be it domestic or international, public or private sector. A project appraisal is necessary for all types of investment commitments – new investment, modernization, expansion, privatization, technology acquisition and equipment replacement.

Project appraisal consists of evaluation of the marketability, technical feasibility, and financial considerations involved in a project. Market and demand analysis

provides a detailed analysis of all market conditions and technical analysis provides an assessment of all technical aspects of the project idea.

Since the primary objective of any firm is to maximize profits, the financial aspects of a project idea must be studied carefully. Even if the project is marketable and technically feasible, it cannot be implemented if it is not financially viable. To assess the financial feasibility of a project idea, the project manager must examine the capital costs, operating costs and revenues of the proposed project.

Example: Techno-economic Feasibility Study for the Development of Greenfield Airport at Jewar Uttar Pradesh by PwC

The project appraisal of the Noida International Airport at Jewar, Uttar Pradesh was developed by Flughafen Zürich AG (Zurich Airport) and PwC. This appraisal comprised of the following:

Marketability

Imminent saturation of the existing Indira Gandhi International Airport in Delhi presents a case for a second airport in the National Capital Region to handle the future traffic projections. The second airport in the NCR was aimed mainly at reducing the burden on IGI Airport, which was expected to reach its peak capacity of handling close to 110 million passengers annually within the next decade.

Technical Feasibility Appraisal

As part of assessing the technical feasibility of the project, the following parameters were looked into:

Location: South of Greater Noida on 1334 Ha of land

Area: 1,334 hectares

Estimated Cost: Rs. 29,650 crore

Number of phases: 4

Phase 1 opening / start of operations: 2024

Number of passengers to be handled: 60 million / annum

Runways & terminals: 2% and 4 respectively

Owner: Noida International Airport Limited (NIAL)

Operator: Yamuna International Airport Private Limited (YIAPL) – 100% subsidiary of Zurich Airport International

Economic and Financial Appraisal – The components included:

a. Project site and field survey.

b. Potential of passenger and cargo traffic from 2025-2050 and non-aeronautical revenue potential (economic and financial feasibility).

Contd. ……

c. Detailed analysis of project in all the four phases and the revenue to be generated.

d. Capital expenditure, financial assessment, and IRR.

e. Yield - ₹ 800 per passenger and UDF of under ₹ 500 per passenger.

f. Cost of equity and cost of debt is assumed to be 16% and 10.5% respectively.

g. Financial analysis of aero and non-aero components - Equity IRR of 16.3% and Project IRR of 14.4% for the project SPV.

h. Other benefits - International Civil Aviation Organization (ICAO) estimated the output and employment multipliers of aviation - 3.25 and 6.10 (Every ₹ 100 spent on air transport contributed to ₹ 325 INR worth of benefits, and every 100 direct jobs in air transport resulted in 610 jobs in the economy as a whole).

A project appraisal involves evaluation of the marketability, financial and technical feasibility.

Sources:

1. *https://www.scribd.com/document/451394309/Noida-International-Airport-TEFR*
2. *https://themetrorailguy.com/jewar-noida-international-airport-status-news-plan-design/ dated 25th November, 2021. Accessed on 09.07.22.*

17.4 Sources of Funding for International Projects

International projects involve huge outlay and hence firms undertaking such projects usually seek funding. Such funding is given by any financial institution only after looking into the various aspects of project feasibility. In other words, project appraisal is a pre-requisite for any kind of project funding. So, once a firm is ready with its project appraisal report, it can approach the financial institutions for funding. There are five forms of funding for international projects:

1. **Foreign Direct Investment (FDI)** – Foreign Direct Investment (FDI) is the investment made in physical assets like plant and machinery in a foreign country, with the management control being retained by the domestic investor. It differs from international portfolio investments in two aspects. Firstly, while portfolio investments are made in financial assets, FDI is made in physical assets. Secondly, portfolio investment does not result in a managerial control over the company whose securities are bought, whereas FDI usually results in managerial control over the operations of the foreign entity. FDI can be done in two ways:
   - Government route which involves approval from the Foreign Investment Promotion Board (FIPB), and
   - Automatic route which does not require any central government permission

   FDI flow into the Indian market is discussed in later sections of the unit.

Example: FDI Equity Inflow Highest in 2021

India recorded highest ever annual FDI inflow of USD 83.57 billion in the Financial Year 2021-22. Computer software & hardware projects emerged as the top recipient sector of FDI equity inflow during FY 2021-22 with around 25% share followed by automobile industry (12%) and infrastructure sector received 7.9 billion $ (9.5%).

One of the main attributes to this increase was the government scheme (National Infrastructure Pipeline) wherein FDI and private investments were allowed to the extent of 100%. GoI liberalised FDI policy to attract investments and reforms were undertaken across various sectors such as coal mining, single brand retail trading, civil aviation, defence, insurance and telecom projects.

International projects involved huge outlay and hence firms undertaking such projects seek funds from various sources.

Source:https://pib.gov.in/PressReleasePage.aspx?PRID=1826946#:~:text='Computer%20Software%20%26%20Hardware'%20has,Automobile%20Industry%20(12%25)%20respectively dated 20th May, 2022. Accessed on 09.07.22.

2. **Foreign Institutional Investment (FII)[1]** - Foreign Institutional Investor (FII) means an institution established or incorporated outside India which proposes to make investment in securities in India. They are registered as FIIs in accordance with Section 2 (f) of the SEBI (FII) Regulations, 1995. FIIs are allowed to invest in primary and secondary capital markets in India through the Portfolio Investment Scheme (PIS). The ceiling for overall investment for FIIs is 24 per cent of the paid up capital of the Indian company and 10 per cent for NRIs/PIOs. The limit is 20 per cent of the paid up capital in the case of public sector banks, including the State Bank of India.

   As per an RBI Circular, with effect from June 1, 2018, the monitoring of foreign investment limits in Indian listed companies has been brought under the purview of the NSDL and CDSL depositories. The stock exchanges (BSE, NSE and MSEI) shall provide the data on the paid-up equity capital of an Indian company to its Designated Depository. The information provided by the companies shall be stored in a Company Master database. A red flag shall be activated whenever the foreign investment within 3% or less than 3% of the aggregate NRI/FPI limits or the sectoral cap[2].

3. **External Commercial Borrowings (ECB)[3]** – External Commercial Borrowings are commercial loans raised by eligible resident entities from recognised non-resident entities. In other words, it refers to commercial loans [in the form of bank loans, buyers' credit, suppliers' credit, securitized instruments (e.g. floating rate notes and fixed rate bonds)] availed from non-resident lenders with minimum average maturity of 3 to 5 years.

1 https://www.rbi.org.in/scripts/bs_fiiuser.aspx
2 https://rbidocs.rbi.org.in/rdocs/content/pdfs/SEBI05042018.pdf
3 https://rbidocs.rbi.org.in/rdocs/notification/PDFs/15MDC8CEB9A7BDE64745B9BE1DCEC3293 CA1.PDF

ECBs should meet with statutory requirements such as minimum maturity, permitted and non-permitted end-uses, maximum all-in-cost ceiling, etc.

The framework for raising loans through ECB comprises the following three tracks[4]:

Track I: Medium term foreign currency denominated ECB with minimum average maturity of 3/5 years.

Track II: Long term foreign currency denominated ECB with minimum average maturity of 10 years.

Track III: Indian Rupee (INR) denominated ECB with minimum average maturity of 3/5 years.

The ECB Framework enables permitted resident entities to borrow from recognized non-resident entities in the following forms:

i. Loans including bank loans
ii. Securitized instruments (e.g. floating rate notes and fixed rate bonds, non-convertible, optionally convertible or partially convertible preference shares / debentures)
iii. Buyers' credit
iv. Suppliers' credit
v. Foreign Currency Convertible Bonds (FCCBs)
vi. Financial Lease
vii. Foreign Currency Exchangeable Bonds (FCEBs)

Under the ECB Framework, ECBs can be raised through two routes:

- Automatic route - For the automatic route, the proposals are examined by the Authorised Dealer Category-I (AD Category-I) banks.
- Approval route - Under the approval route, the prospective borrowers are required to send their requests to the RBI through their ADs for examination.

4. **International Capital Markets** – International projects require finance in Indian rupees as well as in foreign currencies to finance their projects that involve huge outlays. Since borrowing represent tax benefits when compared to raising capital, the international capital market which promotes lending and borrowing of foreign currencies has developed immensely in recent times. Several financial instruments are traded in such markets such as the Euro bonds, Foreign bonds, Floating Rate Notes, Euro commercial papers etc.

4 https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=10204

5. **Multilateral Financial Institutions** – Several multilateral financial institutions grant funding or aid to international projects. These institutions include World Bank (WB), Asian Development Bank (ADB), International Monetary Fund (IMF), International Bank for Reconstruction and Development (IBRD) etc., which largely associate themselves with funding for social and developmental activities. The World Bank's" Country Partnership Framework for India for the period of financial year 2018 to financial year 2022 was announced in July, 2018. This was a comprehensive framework that involved primarily three focus areas - (i) promoting resource efficient growth; (ii) enhancing competitiveness and enabling job creation; and (iii) investing in human capital[5].

   On the other hand, there are also multilateral institutions such as the International Finance Corporation (IFC) which was incorporated in 1956 to help the development of private enterprises in different countries. It thus supplements the activities of the World Bank. IFC helps the private sector in a number of ways. Since 1956, IFC has invested in nearly 400 companies in India, providing almost $15 billion in financing from its own account and mobilization from external resources.

   There are also many governmental organizations, non-governmental organizations and private sector funding institutions too.

Example: India Remains an Attractive Destination for FDI

Consulting firm Deloitte in its survey report in 2021 mentioned that 40% of the 1,200 global business leaders in the US, UK, Japan and Singapore were having plans to make additional or first-time investments in India.

Gross FDI inflow in FY 22 was at $83.6 billion as against $82 billion in FY21 and $74.4 billion in FY20. The cumulative FDI inflow at $ 570 billion is a clear indication of investors showing more interest in investing in India.

According to the chief economist of Bank of Baroda, investors look for the following important aspects before taking a call:

a. Long-term potential of a country

b. India is a bright destination for foreign investment

c. Fastest growing economy

d. Growth potential in several sectors such as IT, finance, FMCG, auto, drugs, telecom, infrastructure etc.

These investments are typically in the form of JVs or take up stakes in domestic companies.

Contd. ……

5 https://documents1.worldbank.org/curated/en/277621537673420666/pdf/126667-R2018-0190-REPLACEMENT-India-CPF-Final-post-Board-08242018.pdf

Corporates like to invest overseas for the benefit of diversification and profits across various markets and India is one of the attractive destinations.

Source: https://economictimes.indiatimes.com/news/economy/finance/india-remains-attractive-for-fdi-investors/articleshow/91648995.cms?from=mdr dated 18th May, 2022. Accessed on 09.07.22.

17.5 Reasons for FDI

In the light of liberalization of Indian Economy in 1991, FDI inflows have been steadily rising as the favoured route for investment in projects in India. The amendment of FDI policy in 2014 and 2016 followed by the relaxation of FDI norms in 25 sectors in accordance with the Make in India initiative by the Government of India further accentuated the growth of FDI into India. Firms and MNCs prefer the FDI route to invest in India as it enables them to take advantage of low labour costs, reduced transport costs and the proximity to raw material and markets.

India is ranked among the top 10, as one of the most sought-after destination for inbound investments, marking a presence for being the fastest growing economies of the world[6]. The regulatory environment in foreign investments since 1991 had been consistently eased in making it investor-friendly. The measures taken by the Government of India are directed to open new sectors for Foreign Direct Investment, by increasing the sectoral limits of existing sectors. Simplification of the FDI policy and FDI policy reforms, are meant to provide ease of doing business for foreign investors in India and provides way for acceleration, in the pace of foreign investment in the country.

Though the Government initiatives have been favourable to the FDI inflows into India, the questions lie as to whether Indian companies prefer to invest in foreign assets and what advantages can they reap from such investments. The decision whether to invest in foreign assets or not depends on a number of factors. The reasons for FDI can thus be discussed as follows:

- Economies of scale
- Need to get around trade barriers
- Comparative advantage
- Vertical diversification
- General diversification benefits
- Attacking foreign competition
- Extension of existing international operations
- Product life cycle

6 https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/attractiveness/ey-europe-attractiveness-survey-2021-hr-v1.pdf

- Non-transferable knowledge
- Brand equity
- Protection of brand equity
- Following its clients

Economies of Scale

As the domestic market saturates for a company's products, it starts viewing overseas markets as a potential source of growth. Continuous growth is essential for achieving further economies of scale, which is necessary for any business enterprise to survive in a competitive market.

Need to Get Around Trade Barriers

Despite the growing importance of international trade, trade barriers continue to be in place in most of the countries due to various economic, political and social reasons. The need to get around these trade barriers prompts corporates to make FDI in order to expand the market for its products.

Comparative Advantage

The locational and other advantages offered by a country by way of lower costs, favorable regulatory environment etc., serve as an important incentive for a corporate to start production facilities abroad. The sectoral limits of FDI is presented in Table 17.1 below:

Table 17.1: FDI Policy: Sectoral Limits of FDI and Entry Route for Major Sectors

Sector	FDI Limit	Entry Route
Agriculture and Animal Husbandry	100%	Automatic
Plantation Sector	100%	Automatic
Mining	100%	Automatic
Petroleum & Natural Gas	100%	Automatic
Petroleum & Natural Gas (Petroleum Refining)	49%	Automatic
Defence Manufacturing	100%	Automatic up to 74% Above 74% under Government route
Broadcasting	100%	Automatic
Broadcasting Content Services	49%	Government
Up-linking of Non-'News & Current Affairs' TV Channels/ Down-linking of TV Channels	100%	Automatic

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Print Media	26%	Government
Civil Aviation – Airports	100%	Automatic
Civil Aviation – Air Transport Services	100%	Automatic up to 49% Above 49% under Government route 100% Automatic for NRIs
Industrial Parks	100%	Automatic
Satellites – Establishment and Operation	100%	Government
Private Security Agencies	74%	Upto 49% Automatic; Government route beyond 49% and up to 74%
Telecom Services	100%	Automatic up to 49% Government route beyond 49%
Trading	100%	Automatic
E-Commerce Activities	100%	Automatic
Railway Infrastructure	100%	Automatic
Asset Reconstruction Companies	100%	Automatic
Banking- Private Sector	74%	Automatic up to 49% Above 49% & up to 74% under Government route
Banking- Public Sector	20%	Government
Credit Information Companies	100%	Automatic
Non-Banking Finance Companies (NBFC)	100%	Automatic
Insurance	49%	Automatic

Source: Department of Industrial Policy and Promotion, "FDI policy", 2020 https://dpiit.gov.in/sites/default/files/FDI-PolicyCircular-2020-29October2020_0.pdfThis initiative of Indian Government greatly helped in attracting FDI inflows.

Vertical Diversification

Companies going for vertical diversification may sometimes need to expand overseas due to non- availability of opportunities in the domestic market. E.g., if a foreign country has abundant supplies of an essential raw material, the company may like to diversify by investing in that market, thus ensuring smooth supply of

the raw material. Similarly, if there is a flourishing industry abroad which can serve as a captive consumer of a company's final product, the company may like to establish its presence there.

General Diversification Benefits

A corporate may like to invest overseas for the benefit of diversification across various markets. As in the case of portfolio investments, investment in physical assets when spread over various countries, is expected to give a steadier or a higher stream of income.

Attacking Foreign Competition

Companies being challenged by foreign competitors in their home country may have an incentive in establishing production bases in the competitors' countries. The incentive may be two-fold. On one hand, it may provide them with the same cost advantages as their competitors. At the same time, the competitors' attention may get diverted as they start concentrating on protecting their market shares in the home market.

Extension of Existing International Operations

For a corporate involved in exporting goods to other countries, establishing a foreign subsidiary may appear a natural extension. Starting with a sales subsidiary, the corporate may graduate to having licensing agreements, and finally overseas production capacities.

Product Life Cycle

As a product moves to the maturity stage, its production process becomes more standardized and producers from developing countries become interested in producing it. As the developing country producers enjoy a cost advantage at this stage (mainly due to cheap labor), the producers of the country where the innovation took place need to shift their production facilities to the developing countries in order to be able to compete. This requires foreign direct investment.

Non-transferable Knowledge

Certain types of knowledge (e.g., the experience in manufacturing and marketing a particular product), cannot be transferred to foreign producers for a price (unlike a trade mark or a patent), and hence the need to set up overseas operations to fulfill the desire to exploit a company's existing knowledge in foreign markets. Sometimes the knowledge may become non-transferable due to the reluctance of the company to share its secrets, again promoting FDI. E.g., the Coca-Cola company has to set up its own operations everywhere due to its reluctance to share the secret formula of its soft drinks.

Brand Equity

Some brands enjoy international reputation. The popularity of these brands acts as an incentive for their producers to expand overseas. E.g. Levi's set up

operations in India to exploit its international reputation as a producer of good quality denim clothes.

Protection of Brand Equity

Though a company can exploit foreign markets by licensing the use of their brand names, the fear that the licensee may not be able to live up to the company's strict quality standards, may push the company to set up its own manufacturing unit abroad.

Following its Clients

Some service firms may find it both attractive and necessary to expand along with their clients. E.g., the major auditing firms generally extend their operations to countries where their clients are headed due to their clients' need to have a single audit firm across the globe. This sort of expansion becomes necessary due to the possibility of losing business to a competitor having international presence.

The above factors emphasize the reasons why firms prefer the FDI route to invest in other countries' projects. Such investment is beneficial to both – it gives benefits like low labour costs, low transport costs etc., to the investor and on the other hand provides the investee country with a host of advantages.

17.6 Appraisal for FDI

Before making any investment, it is imperative that an estimate is made as to the expected returns from that investment. This requires the investment to be judged both for the cash flows it is expected to generate, as well as for the associated risk. Since foreign direct investment entails ownership of physical assets which are to be employed for specified uses, the process is reduced to analyzing a project, albeit with an important difference. Here, the cash flows are expected to be in a foreign currency (as the investment is made in a foreign country), with the attendant economic, political and social environment (and hence the risks) being different from those applicable to home country projects.

The economic viability of a home country project can be measured using various tools like NPV, IRR, payback period, accounting rate of return etc. However, in an international project there are certain issues involved which affect both the cash flows and the discount rate and thus make these frameworks insufficient. The issues are:

- Blocked funds
- Effect on the cash flows of other divisions
- Restrictions on repatriation
- Taxability of cash flows
- Exchange rate movements
- Subsidized loans by the foreign government.

17.6.1 Blocked Funds

Sometimes, a company may have funds which are blocked in another country due to restrictions on them being remitted. If these funds can be activated and be invested in the new project, the initial outlay for the new project stands reduced accordingly. Suppose the funds were blocked completely and could not be repatriated at all, in that case, the full amount of the activated funds would be deducted from the amount of initial investment. If it is possible to recover a part of the blocked funds (after paying withholding taxes etc.), then that part of the funds which cannot be recovered will be treated as activated funds and deducted from the initial investment. This is so because investing the recoverable part of the funds would be equivalent to recovering and reinvesting them.

17.6.2 Effect on the Cash Flows of Other Divisions

One of the basic principles of financial management is that while evaluating a project, only the incremental cash flows to the corporate as a whole should be taken into consideration. This has to be borne in mind even while evaluating foreign projects. The sales from the new project may reduce the sales of other existing divisions in the same or another country, which cater to the same market. On the other hand, the new project may increase the cash flows of an existing division by serving as a captive customer for its products, or by supplying it raw materials at better rates. All these factors should be considered while estimating the cash flows of the new project.

17.6.3 Restrictions on Repatriation

A number of countries impose restrictions on the profit or the capital that can be repatriated by a company to its foreign parent company. As all the cash flows generated by the foreign subsidiary would not be available to the parent company in the presence of such restrictions, they cannot be considered for evaluating the worth of the project. In such a scenario, only those cash flows which can be repatriated (irrespective of whether they are actually repatriated or not) should be considered.

Under the Make in India initiative, the Government of India provided for relaxation in norms for repatriation of funds to attract FDI investment. The repatriation policy under Make in India is shown in Exhibit 17.2.

Exhibit 17.2: Repatriation under Make in India

Make in India was launched in 2014 to promote the ease of doing business in India. As part of this initiative, the following repatriation policy was implemented:

Repatriation of Dividend:

- Dividends can be freely transferred back without any restrictions.

Repatriation of Capital:

Remittance of the asset is governed by FEMA (Remittance of Assets) Regulations, 2016

- Transfer of capital instruments between residents and non-residents is to be reported in Form FC-TRS. The Form FC-TRS should be submitted to the AD Category-I bank, within 60 days from the transfer of capital instrument or date of receipt of the amount of consideration, whichever is earlier.
- AD Category-I bank can allow remittance of sale proceeds (net of applicable taxes) of a security to the seller of shares resident outside India provided security has been held on repatriation basis, Sale of security has been made in accordance with the prescribed guidelines and NOC/ tax clearance certificate from the Income Tax department.
- AD Category-I banks are allowed to remit winding up proceeds of the companies which are under liquidation subject to payment of taxes.

Repatriation of Interest:

- Interest on fully, mandatorily & compulsorily convertible debentures can also be freely repatriated without any restrictions (net of applicable taxes).

Source: https://www.makeinindia.com/policy/foreign-direct-investment, 2022

There are a number of legal ways to circumvent restrictions on profit repatriations. These should also be accounted for especially as some of them involve the way the project is to be financed. Some of these ways are discussed below:

- Transfer pricing
- Royalties
- Leading and lagging
- Financing structure
- Inter-Company loans
- Currency of invoicing
- Re-invoicing centers
- Countertrade

Transfer Pricing

Transfer pricing refers to the policy of invoicing purchase and sale transactions between a parent company and its foreign subsidiary on terms which are favorable to the parent company, thus shifting a part of the subsidiary's rightful profits to the parent. As this method of circumventing repatriation restrictions is very common, authorities are generally very alert as to the price at which transfers are made.

Royalties

The foreign subsidiary may use the parent company's trademarks and copyrights and pay royalties as compensation. As this is not a transfer of profit, the normal restrictions on profit repatriation do not cover these payments.

Example: Royalty Payments Continue to be Moderated by MNCs in India

Since 2019, royalty payments of MNCs were moderated and are now more aligned to revenues and profits. Further the royalty payments by multinational corporations (MNCs) contracted by about 10 per cent in FY21. The top five MNCs account for nearly 80 per cent of the aggregate royalty paid in the form of technical and know-how fees.

Other methods of payments include operations support and cost of expatriates levied on the Indian arm of global companies by the parent companies. Though these may not be directly attributed to royalty payment from the point of regulatory perspective, IiAS typically factors this into its assessment.

Companies adopt legal ways to circumvent restrictions on profit repatriations due to restrictions imposed by certain countries.

Source: https://indianexpress.com/article/business/economy/mnc-royalty-payments-continue-to-moderate-7726754/ dated 17th January, 2022. Accessed on 10.07.22.

Leading and Lagging

Leading and lagging payments between the parent company and the subsidiary, based on expected movements in exchange rates can help in transferring profits from the latter to the former. Suppose the subsidiary has to pay its parent company a sum which is denominated in a currency that is expected to harden. The subsidiary lags (delays) the payment so that a part of the subsidiary's profits get transferred to the parent company. In the event of such a payment being denominated in a currency that is expected to depreciate, the subsidiary leads (advances) the payment, again with the same effect.

Financing Structure

An overseas project can be funded solely through equity investments, or through a mixture of equity and debt. In cases where there are restrictions on repatriation of profits and repayment of capital, part of the project can be funded through loans from the parent company to the foreign subsidiary. Generally, there are fewer restrictions on payment of interest and repayment of loans than on profit repatriation. Also, interest payments are tax deductible for the subsidiary whereas dividend payments are not (for the parent company, both are taxable). There is another tax incentive involved as repayment of loans is non-taxable in the hands of the parent company, whereas funds transferred as dividends are. This way, repatriation restrictions can be manoeuvred around, along with getting additional tax advantages, by extension of loans to the subsidiary by the parent company, instead of making direct equity investments.

Inter-Company Loans

The methods mentioned above are fairly common ways of getting around regulations in a legal manner. Over a period of time, authorities have become aware of them and frown upon payments to a foreign parent company, under whatever disguise. Hence the danger of the subsidiaries being disallowed from making such payments always looms large. To get around these problems, companies can resort to inter-company loans. The simplest way is that two companies make parallel loans to each other's subsidiaries, with the amounts and timing of the loans and the interest payment as also the loan repayment matching. This can be refined if each of the subsidiary companies is based in the same country as the other's parent company. In that case, the loans come totally out of the ambit of exchange control regulations as both the loans are made within the countries involved. The only drawback of this method is that the holding company cannot set off the loan which it has extended against the loan that its subsidiary has received (which would be possible in quite a few countries if it were a direct loan to its own subsidiary), as a part of consolidation of accounts, and the loans would appear both as an asset as well a liability on its books.

Another way of extending such loans without the parent getting directly involved is a back-to-back loan involving a major multinational bank or a financial institution. Under this method, the parent corporation makes a loan to the bank/FI, with the bank/FI extending an equivalent loan to the foreign subsidiary. For the bank, the loan is risk-free as it is backed by the parent company's loan. From the parent company's point of view, there is a lesser political risk involved, as in case of exchange controls being imposed, it is less likely that interest payments and loan repayments to a multinational bank/FI would be restricted than if the payments were to be made directly to the parent company.

Currency of Invoicing

Choice of currency in which intra-group trade is invoiced is an important tool for transferring profits within different companies of the same group. Exchange controls are generally imposed to prevent the local currency from depreciating. If the currency is expected to depreciate despite the controls, the exports from the subsidiary based in that country to other group companies can be invoiced in that country's currency. Also, the imports of that subsidiary from other group companies can be invoiced in some hard currency (one that is expected to appreciate). As the country's currency depreciates, the subsidiary's profits will fall from what they would have been otherwise and the profits of other group companies will increase. The other group companies which benefit from this should be based in countries which have either lesser or non-existent exchange controls, or a lower tax rate or a hard currency. This way the overall profit repatriated to the parent company increases.

Re-invoicing Centers

Trades between companies in the same group can be routed through a re-invoicing center. Re-invoicing centers act as an intermediary by buying from one company and selling them on to the other. The margin between the buying and the selling rates is the amount of profit transferred from the subsidiary to the re-invoicing center. Such centers are mainly used for the management of exposures, but can also be used for converting non-repatriated cash flows into repatriated cash flows, when set up in countries with lesser capital controls. In addition to such conversion, setting up of such re-invoicing centers in tax havens can reduce the overall taxes, and hence increase the after-tax cash flows.

Countertrade

Counter trade involves the parent company and the subsidiary buying from and selling to each other. The most common form taken is barter trade. While the goods transferred from the subsidiary (the value of which may be very high compared to the value of goods received by it) may not be useful for the parent company directly, it can sell them to some third party, with the proceeds serving as an indirect transfer of the subsidiary's profits.

Check Your Progress - 1

1. What is the policy of invoicing purchase and sale transactions between a parent company and its foreign subsidiary known as?
   a. Currency invoicing
   b. Re-invoicing
   c. Transfer pricing
   d. Counter trade
   e. Royalties
2. Which of the following represents a way in which FDI can flow into India without restrictions?
   a. Direct route
   b. Government approved route
   c. Foreign Investment Promotion Board approved route
   d. Automatic route
   e. Indirect route
3. Which of the following is not a problem associated with international project appraisal?
   a. Blocked funds
   b. Effect on the cash flows of other divisions

c. Removal of restrictions on repatriation

d. Taxability of cash flows

e. Exchange rate movements

4. These centers aid in conversion of non-repatriated cash flows into repatriated cash flows. Identify them

a. Invoicing centers

b. Counter-trade centers

c. Re-invoicing centers

d. Banks

e. Foreign subsidiaries

5. Which of the following does not represent a legal way to circumvent restrictions on profit repatriations?

a. Transfer pricing

b. Royalties

c. Leading and lagging

d. Inter-company loans

e. Transfer mispricing

17.6.4 Taxability of Cash Flows

The profits of a foreign subsidiary are first taxed in the foreign country. This does not pose any problem as far as evaluation of a project is concerned, as the cash flows considered are post-tax, in accordance with financial management principles. The issue that comes up when the subsidiary is based in a foreign country is that of taxes on repatriated profits. When the subsidiary repatriates its profits to its parent company, there is generally a withholding tax levied by the foreign government. These profits, when received by the parent company, are again taxed in the domestic country as dividends received. To avoid such problems, countries generally enter into double-taxation agreements, whereby these taxes become payable only in one country (or partly in one and partly in another). Even in the absence of such agreements, the parent company generally receives a tax credit for the withholding taxes paid by the subsidiary. As the tax credit cannot exceed the tax to be levied by the domestic tax authorities, if the foreign withholding tax rate is higher than the domestic dividend tax rate, the corporation as a whole, ends up paying the higher tax rate. Due to this, the tax rate that is considered while evaluating such projects is the higher of the domestic and the foreign rates.

17.6.5 Exchange Rate Movement

The volatility of exchange rates is a well-known fact. The rate at which the initial investment is converted into the foreign currency need not be the same as the exchange rate prevailing at the time of repatriation of profits. Since the relevant cash flows are those from the point of view of the parent company, the cash flows to the subsidiary need to be converted into the domestic currency of the parent company, at rates expected to prevail in the future.

17.6.6 Subsidized Loans by the Foreign Government

The foreign government may sometimes extend concessional loans to a company setting up operations in its country in order to encourage FDI or to promote economic activity. This reduces the cost of funds for the project. Yet, this reduction of cost of funds may not get reflected as a lower discount rate in the traditional models, because this concession is not directly available to the company's investors.

Activity 17.1
The impetus given to FDI in India by the Indian Government has also given rise to the fear of its impact on domestic industry especially the MSME sector. In this context, evaluate the impact of FDI investment in India.
Answer:

17.7 The Adjusted Present Value (APV) Criteria

It is quite difficult to build the specific factors associated with foreign projects evaluation into the frameworks used for evaluating domestic projects. Hence foreign project evaluation requires specific evaluation techniques. This hurdle can be at least partially overcome by using the Adjusted Present Value (APV) approach. This approach is an extension of the Modigliani-Miller approach to valuation of a company. It first measures the present value of the basic cash flows of a project using the all-equity rate of discounting, and then tackles the specific issues one by one. By breaking up the evaluation in this manner, it provides scope for analyzing an indefinite number of additional factors which may affect an international project.

The adjusted present value of a foreign project is given by:

$$APV = -S_o(C_o - A_o) + \sum_{t=1}^{n} \frac{(S_t^* C_t^* + E_t^*)(1-T)}{(1+k_e)^t} + \sum_{t=1}^{n} \frac{D_t T}{(1+k_d)^t} + \sum_{t=1}^{n} \frac{rB_o T}{(1+k_b)^t}$$

$$+ S_o \left[CL_o - \sum_{t=1}^{n} \frac{R_t}{(1+k_c)^t} \right] + \sum_{t=1}^{n} \frac{P_t^* T}{(1+k_p)^t} + \sum_{t=1}^{n} \frac{I_t}{(1=k_i)^t}$$

where,

APV = Adjusted Present Value

S_0 = Current exchange rate

C_0 = Initial cash outlay in foreign currency terms

A_0 = Activated funds

S_t^* = Expected exchange rate at time 't'

n = Life of the project

C_t^* = Expected cash flow at time 't', in foreign currency terms

E_t^* = Expected effect on the cash flows of other divisions at time 't', expressed in domestic currency terms; can be either positive or negative

T = Domestic or foreign tax rate, whichever is higher

D_t = Depreciation in home currency terms at time 't'. (If the depreciation is not allowed to be set off by the parent company against its own profits it needs to be defined in foreign currency terms with its present value being converted at S0 into domestic currency terms).

B_0 = Contribution of the project to borrowing capacity of the parent firm

r = Domestic interest rate

CL_0 = Amount of concessional loan received in foreign currency

R_t = Repayment of concessional loan at time 't'

P_t^* = Expected savings at time 't' from inter-subsidiary transfer pricing

I_t = Illegally repatriated cash flows at time 't'

k_e = All-equity discount rate, reflecting all systematic risks, including country risk and exchange-rate risk

k_d = Discount rate for depreciation allowances

k_b = Discount rate for tax savings from generation of borrowing capacity

k_c = Discount rate for savings due to concessionary loans, generally the interest rate in the absence of concessionary loans

k_p = Discount rate for savings through transfer pricing

k_i = Discount rate for illegal transfers

The last term in the equation requires some explanation. A project may be unviable despite the use of all the possible ways of legally repatriating a subsidiary's profits. Under such conditions, the parent company may resort to use

illegal ways of remitting these profits. In such a situation, these illegal cash flows should also be taken into account while evaluating the project.

17.7.1 Discount Rate

As previously mentioned, k_e is the all-equity discount rate, reflecting a premium for all systematic risks, including country-risk and exchange-risk. The discount rate also reflects the risk reduction due to the portfolio effect, i.e., due to the imperfect correlation between returns from the various markets.

An important factor that needs to be considered is inflation. The presence of inflation makes the choice between the real and the nominal rate of discount, crucial. It becomes important to match nominal cash flows with a nominal discount rate and real cash flows with a real discount rate.

To match cash flows with the appropriate discount rate, it becomes essential to analyze the nature of the cash flow. If the future cash flow is predetermined, or contractual in nature (e.g., depreciation allowance, or pre-contracted sales at a pre-determined price), then the nominal discount rate should be used as the cash flows would be expressed in nominal terms. If the future cash flows need to be estimated, then either real cash flow can be estimated and discounted at the real discount rate, or the inflation estimates can be built into the cash flows which would then be discounted at nominal discount rates. Let us now analyze the various discounting factors one by one.

ke	:	This rate should be the nominal discount rate for contractual cash flows. As the cash flows have been converted to the domestic currency, it should be the domestic nominal discount rate. For non-contractual cash flows, if expressed in nominal terms, this should be the nominal rate.
kd	:	Since the depreciation charge is based on the historical cost of assets and is hence contractual, the discount rate should be the domestic nominal rate. If there is a strong probability of positive cash flows being generated and hence of the depreciation tax shield being availed, then the risk-premium may be negligible and the domestic nominal risk-free rate may be used.
kb	:	Since the borrowing capacity would be measured in nominal terms, this should be the nominal rate. Again, if the probability of positive cash flows is strong, the domestic nominal risk-free rate may be used.
kc	:	As the nominal foreign-currency interest rate would have had to be paid in the absence of the concessionary loan, that rate should be used as the discount rate for calculating the present value of the repayments of the concessionary loan.
kp & ki	:	If the relevant cash flows are expressed in domestic, nominal terms, the discount rate should be the domestic nominal rate. As there should be a risk-premium to reflect the possibility of these cash flows not getting remitted, it is suggested that this rate be equal to ke.

Illustration 17.1

Hitech Ltd., is an Indian company manufacturing computers. It plans to set up a manufacturing unit in Switzerland.

The following details are available for the proposed project:

The project outlay is estimated to be SFr 1,00,000. The company currently has SFr 50,000 blocked in Switzerland, out of which it can activate SFr 10,000 for the current project. The life of the project is estimated to be 5 years.

Hitech Ltd., is expecting to receive the following cash flows from the project in the coming years:

Year	Cash flow (SFr)
1	30,000
2	35,000
3	50,000
4	45,000
5	30,000

Currently Hitech Ltd., is exporting computers to Switzerland from its domestic manufacturing unit. The loss of cash flows from this operation due to the new manufacturing unit is expected to be:

Year 1 = ₹ 3,00,000
Year 2 = ₹ 2,00,000
Year 3 = ₹ 1,50,000

The Indian tax rate is 30%, while the Swiss tax rate is 20%. Depreciation is to be provided on the basis of Straight Line Method. The contribution of the project to the borrowing capacity of the firm is ₹ 15 lakh.

The Swiss government extends a concessionary loan of SFr 20,000 to Hitech Ltd. at the rate of 10% p.a. The loan has to be repaid in 5 equal annual installments over the life of the project.

The company expects to save ₹ 1,00,000 p.a. on taxes over the next five years through transfer pricing.

The spot rate is ₹ /SFr 66 and the Swiss franc is expected to appreciate against the rupee @ 5% p.a. for the next 5 years.

The all-equity discount rate is 20%, while the domestic nominal risk-free rate is 10%. The domestic interest rate is ruling at 18%, the Swiss interest rates are ruling at 15%.

The company expects zero salvage value at the end of 5 years. Calculate the APV of the project.

Solution

$S_o (C_o – A_o) = 66 (1,00,000 – 10,000) =$ ₹ 59,40,000

Expected exchange rate at the end of

Year 1 = 66 x 1.05 = ₹ 69.3/SFr

Year 2 = 69.3 x 1.05 = ₹ 72.765/SFr

Year 3 = 72.765 x 1.05 = ₹ 76.40/SFr

Year 4 = 76.40 x 1.05 = ₹ 80.22/SFr

Year 5 = 80.22 x 1.05 = ₹ 84.231/SFr

The present value of the cash flows received by Hitech Ltd., from the project would be

$$= \sum_{t=1}^{n} \frac{(S^{*}C_t^{*} + E_t^{*})(1-T)}{(1+k_e)^t}$$

$$= \frac{(69.3 \text{ X } 30{,}000 - 3{,}00{,}000)(1-0.3)}{(1.2)^1} + \frac{(72.765 \text{ X } 35{,}000 - 2{,}00{,}000)(0.7)}{(1.2)^2}$$

$$+ \frac{(76.4 \text{ X } 50{,}000 - 1{,}50{,}000)(0.7)}{(1.2)^3} + \frac{(80.22 \text{ X } 45{,}000)(0.7)}{(1.2)^4} + \frac{(84{,}231 \text{ X } 30{,}000)(0.7)}{(1.2)^5}$$

= ₹ 10,37,750 +₹ 11,40,793.4 + ₹ 14,86,689.8 + ₹ 12,18,619.79 + ₹ 7,10,952.97

= ₹ 55,94,805.96

The depreciation tax shield will be calculated as follows:

$$D_t = \frac{66 \text{ X } 1{,}00{,}000}{5} = 13{,}20{,}000$$

The present value of the depreciation tax shield

$$= \sum_{t=1}^{n} \frac{D_t T}{(1+k_d)^t}$$

$$= 13{,}20{,}000 \text{ x } 0.3 \text{ x } PVIFA_{(10\%,\ 5)}$$

= ₹ 15,01,156.8

The present value of interest tax shield on the borrowing capacity generated by the firm

$$= \sum_{t=1}^{n} \frac{rB_o T}{(1+k_b)^t}$$

$$= 15{,}00{,}000 \text{ x } 0.18 \text{ x } 0.3 \text{ x } PVIFA_{(10\%,5)}$$

= ₹ 3,07,054.

The annual repayment of concessionary loan

= 20,000/5 = SFr 4,000.

The present value of repayment of concessional loan

$$= \sum_{t=1}^{n} \frac{R_t}{(1+k_c)^t} = 4{,}000 \text{ x } PVIFA_{(15\%, 5)}$$

$$= 4{,}000 \text{ x } 3.3522$$

$$= \text{SFr } 13{,}409.$$

The benefit of the concessionary loan

$$= S_0 \left[CL_0 - \sum_{t=1}^{n} \frac{R_t}{(1+k_c)^t} \right]$$

$$= 66\ [20{,}000 - 13{,}409]$$

$$= ₹\ 4{,}35{,}006.$$

The present value of the expected tax savings due to transfer pricing

$$= \sum_{t=1}^{n} \frac{P_t^* T}{(1+k_p)^t} = 1{,}00{,}000 \text{ x } PVIFA_{(20\%, 5)}$$

$$= ₹\ 2{,}99{,}061.$$

Note: Here, the all-equity discount rate has been used to discount the expected tax savings.

APV = – ₹ 59,40,000 + ₹ 55,94,805.96 + ₹ 15,01,156.8 + ₹ 3,07,054 + ₹ 4,35,006 + ₹ 2,99,061 = ₹ 21,97,083.76

Let us now calculate the NPV for the same set of data, and compare it to the APV figure.

The cash flows for NPV would be:

C_0 = 66 (1,00,000 – 10,000) = ₹ 59,40,000

C_1 to C_5= $(S^* C^*_t + E^*_t)(1 - T) + D_t T + P^*_t T$

C_1 = 17,79,000 (1 – 0.3) + 13,20,000 (0.3) + 100,000 = ₹ 17,41,300

C_2 = 23,46,775 (0.7) + 13,20,000 (0.3) + 1,00,000 = ₹ 21,38,742.5

C_3 = 36,70,000 (0.7) + 13,20,000 (0.3) + 1,00,000 = ₹ 30,65,000

C_4 = 36,09,900 (0.7) + 13,20,000 (0.3) + 1,00,000 = ₹ 30,22,930

C_5 = 25,26,930 (0.7) + 13,20,000 (0.3) + 1,00,000 = ₹ 22,64,851

The project would be financed from various sources as follows:

Domestic debt = ₹ 15,00,000

Concessional loan from foreign government = 20,000 x 66 = ₹ 13,20,000

Equity = 59,40,000 – (15,00,000 + 13,20,000) = ₹ 31,20,000

WACC

$$= 20 \left[\frac{31{,}20{,}000}{59{,}40{,}000} \right] + 18\ (0.3) \text{ x } \left[\frac{15{,}00{,}000}{59{,}40{,}000,} \right] + 10 \left[\frac{13{,}20{,}000}{59{,}40{,}000} \right]$$

$$= 14.09\%.$$

NPV

$$= -59,40,000 \times \left[\frac{17,41,300}{1.1409^1}\right] + \left[\frac{21,38,742.5}{1.1409^2}\right] + \left[\frac{30,65,000}{1.1409^3}\right] + \left[\frac{30,22,930}{1.1409^4}\right] + \left[\frac{22,64,851}{1.1409^5}\right]$$

$= ₹ 22,49,108.85.$

As we can see, the NPV criteria gives a value higher to the APV figure by ₹ 52,025.09. This difference occurs due to the different discount rates used in the two methods, as well as the difference in cash flows. Though this does not have a major effect on the decision in this case as both the figures are positive, using the NPV criteria may lead to wrong decisions in marginal cases. Even if it does not result in an erroneous decision, in all likelihood it will give a return which is different from the return arrived at through the APV method. The use of the APV method assumes that it is possible to identify the various discount rates used in the process. In situations where these discount rates cannot be accurately arrived at, it may be better to use the NPV criteria, as use of inappropriate discount rates may distort the present value figure more than it would be were the NPV criteria used.

The profitability of a project sometimes gets affected by the priorities and the economic policies of the foreign government. Suppose that two projects are similar in all respects except the initial investment. Assuming that the profitability of the two projects (in percentage terms) is also the same, the project with a higher initial investment would have higher cash inflows in subsequent years, leading to a higher APV. If, in addition, the foreign government is trying to attract FDI, it may favor the bigger project, which may get reflected in a larger concessionary loan or more activated funds. This would result in an even higher APV.

Let us now analyze the effect of governmental priorities on other factors affecting the APV of a project. A project being in a sector which is a high priority area for the foreign government may result in one or more of the following:

- A higher amount of blocked funds getting activated.
- More profits being allowed to be repatriated to the foreign parent company.
- Lower taxes (which would affect the profitability of a project only if these rates are still higher than the domestic tax rates faced by the parent company).
- A higher depreciation allowance leading to a higher depreciation tax shield.
- A larger concessionary loan and/or a lower interest rate charged on the loan.

Such treatment would result in an increase in the APV, and hence, the economic viability of a project. In such a scenario, if two different projects with similar commercial viability are being considered by a firm, the fact that one of them is in a sector which is a priority sector for the foreign government, may tilt the decision in its favor. Here the importance of the choice of the discount factors

comes to the fore. Suppose the non-priority sector project is one which enjoys a higher depreciation than the priority-sector project and also suppose that this higher depreciation is exactly offset by an annual benefit through lower interest payments due to a concessionary loan being extended to the latter by the foreign government. The APV of the former project may still be higher than that of the latter, if the discount rate applied to depreciation tax shields is lower than that applied to repayments of the concessionary loan. Hence, the choice of discount rates may make the non-priority sector project more attractive, despite the foreign government extending a concessionary loan to the priority-sector project. This highlights the importance of choosing appropriate discount rates for calculating the adjusted present value of the various components of the cash flow.

Till now, we have been evaluating international projects only from the financial angle. However, in addition to these quantitative aspects, there are a number of qualitative aspects which need to be considered, especially before undertaking an international project. Some of these are

17.7.2 Economic Scenario

The current and the future economic scenario of the country in which the project would be based, is very crucial for the profitability of the project. For example, Brexit (the UK's decision to exit the European Union) was initially estimated to reduce the inward FDI flows into Britain by 22%. However, contrary to this estimate the FDI inflows showed a six-fold increase to USD 179 billion in 2016[7]. A few of the economic factors which could affect the project's performance are the projected GDP growth rate, the income level in the economy, the projected growth rate of various sectors of the economy, the prevalent and projected interest rates, the inflation rate, the degree of development of financial markets, budget deficit, unemployment rate etc.

17.7.3 Political Scenario

The political ideology of the present government and that of the likely future governments affects an international project's performance in more than one way. The most important factor is the government's general outlook towards FDI. A project in a country which is hostile towards foreign capital is less likely to succeed than one based in a country which welcomes foreign capital. The political ideology of the government is also likely to determine the sectors open to FDI. The government's commitment to introduce and continue with economic reforms also depends on its political ideology. Many economic factors like the budget deficit, money supply, etc., also get directly affected by the government's

7 Laza kekic, "Foreign direct investment will remain robust post-Brexit", London School of Economics and Political Science, March 20th 2017
http://blogs.lse.ac.uk/brexit/2017/03/20/foreign-direct-investment-will-remain-robust-post-brexit/

policies. Lastly, the political stability or its absence in a country affects the chances of continuity of all the economic policies affecting FDI.

17.7.4 Financing Aspects

Sometimes it becomes very difficult to obtain financing for an international project due to the risks involved. Hence, the availability of finance from domestic and foreign sources becomes an important factor that needs to be considered before such a project can be undertaken.

Check Your Progress - 2

6. Which of the following is a suitable appraisal method for international projects?
   a. APV
   b. NPV
   c. Accounting rate of return
   d. Payback period
   e. Benefit cost ratio
7. Which of the following is not a qualitative aspect to be considered for appraising international projects?
   a. Economic scenario
   b. Political scenario
   c. Financing aspects
   d. Cash flows
   e. Inflation rate
8. Which of the following statements is not true in respect of a project being in a sector which is a high priority area for the foreign government?
   a. A lower amount of blocked funds getting activated.
   b. More profits being allowed to be repatriated to the foreign parent company.
   c. Lower taxes (which would affect the profitability of a project only if these rates are still higher than the domestic tax rates faced by the parent company).
   d. A higher depreciation allowance leading to a higher depreciation tax shield.
   e. A larger concessionary loan and/or a lower interest rate charged on the loan
9. The presence of which element makes the choice between the real and the nominal rate of discount crucial?

a. Inflation
b. Cash flows
c. Taxes
d. Budget deficit
e. Unemployment

10. Which of the following factors may result in variation between APV and NPV values for the same project?
    a. Cash outlay
    b. Discount rate variation
    c. Timing of cash flows
    d. Depreciation rate
    e. Even cash flows

Activity 17.2

International project investments require a detailed and thorough analyses on resourcing the facts, advantages, significance and nature of investment to be made, by profiling into the company's competitive stand, within and outside the country and its capability in terms of strengths and weaknesses. Assess the significance and steps involved for appraising a foreign direct investment proposal.

Answer:

……
……

17.8 Summary

- Investing money in projects based in foreign countries through FDI is a very risky and challenging affair, but it has its own advantages.
- Investing money in overseas projects is essentially a long-term decision, which needs to be taken after a lot of careful deliberation.
- India has emerged as the most sought-after destination for inbound investments, primarily after the economic reforms of 1991 and subsequent relaxations in regulatory environment for foreign investments.
- The decision of Indian companies to invest in foreign assets and what advantages can they reap from such investments depends on a number of factors such as economies of scale, need to get around trade barriers, comparative advantage, vertical diversification, general diversification benefits, attacking foreign competition, extension of existing international

operations, product life cycle, non-transferable knowledge, brand equity, protection of brand equity and following its clients

- While the quantitative evaluation of a project involves an analysis which considers a number of factors in addition to those considered by the more commonly used appraisal criteria, the qualitative evaluation of the project becomes equally important due to the complexities involved. A project undertaken after a thorough analysis of both these factors can prove to be a highly rewarding experience.
- The economic viability of a home country project can be measured using various tools like NPV, IRR, payback period, accounting rate of return etc. However, in an international project there are certain issues involved which affect both the cash flows and the discount rate and thus make these frameworks insufficient.
- The issues involved in international project appraisal are: blocked funds, effect on the cash flows of other divisions, restrictions on repatriation, taxability of cash flows, exchange rate movements and subsidized loans by the foreign government.
- It is quite difficult to build the specific factors associated with foreign projects evaluation into the frameworks used for evaluating domestic projects. This hurdle can be at least partially overcome by using the Adjusted Present Value (APV) approach.
- APV approach is an extension of the Modigliani-Miller approach to valuation of a company. It first measures the present value of the basic cash flows of a project using the all-equity rate of discounting, and then tackles the specific issues one by one. By breaking up the evaluation in this manner, it provides scope for analyzing an indefinite number of additional factors which may affect an international project.
- The qualitative aspects involved in international project appraisal consist of evaluating the political environment, economic scenario and financial aspects of the project.

17.9 Glossary

Adjusted Present Value is the Net Present Value (NPV) of a project, where the financing is sourced out of equity plus present value of other financing benefits, caused out of debts.

Blocked Funds are funds that a company may have which are blocked in another country due to restrictions on them being remitted.

Concessional Loan also termed as soft loans, are loans provided at lower interest rates than market rates or has longer grace periods or both, comparatively issued on lenient terms by the lender.

Conglomerate refers to a multifaceted corporation involved in a variety of products and services.

Countertrade involves the parent company and the subsidiary buying from and selling to each other. The most common form taken is barter trade.

Covenant is a definite provision in a loan contract.

Export Credit Guarantee Corporation (ECGC) is a Government of India undertaking which provides insurance to Indian exporters of goods and services.

Financial Structure is the pattern of total financing employed by a firm.

Horizontal Merger is a merger between one or more firms engaged in the same line of activity.

Hurdle Rate is the minimum acceptable rate of return on a project.

Lagging is the term used for delaying the payment by the subsidiary to its parent company in cases where the amount is denominated in a currency that is expected to harden.

Leading is used to denote the advance payment made by subsidiary to the parent when a payment is being denominated in a currency that is expected to depreciate.

Merger is a combination of two or more firms into one firm. A merger may involve absorption (acquisition) or consolidation. In absorption, one firm acquires one or more other firms. In a consolidation, two or more firms combine to form a new entity. We use the term merger and amalgamation interchangeably.

Re-invoicing centers act as an intermediary by buying from one company and selling them on to the other. The margin between the buying and the selling rates is the amount of profit transferred from the subsidiary to the re-invoicing center.

Repatriation refers to the profits being returned or earnings to be retained back to the place of origin or to the parent company.

Synergy is the gain from combining two or more units. In a synergistic merger, the earnings of the combined entity are expected to exceed the sum of the earnings of the combining entities.

Trade Barriers are restrictions imposed on import of goods and services imposed by the Government usually to protect the domestic industry from competition.

Transfer pricing refers to the policy of invoicing purchase and sale transactions between a parent company and its foreign subsidiary on terms which are favorable to the parent company, thus shifting a part of the subsidiary's rightful profits to the parent.

Vertical Merger is a merger between a supplier and its customer.

17.10 Self-Assessment Test

1. Explain in detail the reasons for existing and emerging companies to enter international market through foreign direct investments.
2. Describe how international projects can be financed by overcoming the restrictions on profit repatriations.
3. Enumerate on the critical success measures of Foreign Direct Investments.
4. Illustrate the evaluation criteria used to assess the adjusted present value of a firm's new project investment in international market.
5. Briefly explain the political, economic and financial considerations that the companies have to look into before making investments through FDI.

17.11 Suggested Readings / Reference Material

1. Brealey Myers (2020). Principles of Corporate Finance, 13th edition, USA: McGraw-Hill Companies Inc.
2. Prasanna Chandra (2019). Financial Management – Theory and Practice, 10th edition, New Delhi: Tata McGraw-Hill.
3. I.M. Pandey (2021). Financial Management, 12th edition, New Delhi: Pearson Education.
4. Francis Cherunilam (2020). International Business — Text and Cases, 6th Edition, PHI Learning.
5. P.G. Apte (2020). International Financial Management, 8th Edition, McGraw Hill Education (India) Private Limited.
6. John Tennent (2018). The Economist Guide to Financial Management. Economist Books.

17.12 Answers to Check Your Progress Questions

1. (c) Transfer pricing

Transfer pricing refers to the policy of invoicing purchase and sale transactions between a parent company and its foreign subsidiary on terms which are favorable to the parent company, thus shifting a part of the subsidiary's rightful profits to the parent company.

2. (d) Automatic route

FDI can be done in two ways:

- Government route which involves approval from the Foreign Investment Promotion Board (FIPB). Approval from Cabinet Committee on Security is required for more than 49% FDI in defence
- Automatic route which does not require any central government permission

3. (c) Removal of restrictions on repatriation

In an international project, there are certain issues involved which affect both the cash flows and the discount rate and thus make these frameworks insufficient. The issues are: Blocked funds, Effect on the cash flows of other divisions, Restrictions on repatriation, Taxability of cash flows, Exchange rate movements and subsidized loans by the foreign government.

4. (c) Reinvoicing centers

Such centers are mainly used for the management of exposures, but can also be used for converting non-repatriated cash flows into repatriated cash flows, when set up in countries with lesser capital controls.

5. (e) Transfer mispricing

There are a number of legal ways to circumvent restrictions on profit repatriations. These should also be accounted for especially as some of them involve the way the project is to be financed. Some of these ways are transfer pricing, royalties, leading and lagging, financing structure, inter-company loans, currency of invoicing, re-invoicing centers and countertrade.

6. (a) APV

It is quite difficult to build these factors into the frameworks used for evaluating domestic projects. These hurdles can be at least partially overcome by using the Adjusted Present Value (APV) approach.

7. (d) Cash flows

The qualitative aspects to be considered are economic, political and financing aspects

8. (a) A lower amount of blocked funds getting activated

A project being in a sector which is a high priority area for the foreign government may result in one or more of the following:

- A higher amount of blocked funds getting activated.
- More profits being allowed to be repatriated to the foreign parent company.
- Lower taxes (which would affect the profitability of a project only if these rates are still higher than the domestic tax rates faced by the parent company).
- A higher depreciation allowance leading to a higher depreciation tax shield.
- A larger concessionary loan and/or a lower interest rate charged on the loan.

9. (a) Inflation

An important factor that needs to be considered is inflation. The presence of inflation makes the choice between the real and the nominal rate of discount, crucial. It becomes important to match

nominal cash flows with a nominal discount rate and real cash flows with a real discount rate.

10. (b) Discount rate variation

The APV criteria may give a value different from NPV criteria due to the different discount rates used as well as the difference in cash flows.

Unit 18

International Trade: Theories and Practices

Structure

"Trade is not invasion. It does not involve aggression on one side and resistance on the other, but mutual consent and gratification. There cannot be a trade unless the parties to it agree."

- *Henry George*

18.1 Introduction

In today's globalized world, businesses often indulge in international trade activities. Though the activities may be similar to the domestic business operations, there are however, specific issues that a business needs to look into. Besides trade activities, firms are also tapping the international markets for funds.

International Trade and Finance are both conducted in a currency of choice between the two parties and it may be a currency that is not the domestic currency. A business dealing in these activities should thus possess knowledge about international monetary systems and how they work, how exchange rates are determined, what types of risks are businesses exposed to and how to manage them.

In the previous unit, we learnt the various aspects related to appraisal of international projects. In this session, we will learn about international trade and finance. International Trade and Finance activities are largely impacted by the Governmental policies and regulations. These policies and regulations are framed to maintain a favourable balance of payments situation. Understanding what type of transactions improve the BoP for a business, will enable it to tune their international trade activities with the government policies.

18.2 Objectives

After reading through the unit, you should be able to:

- Apply the theories of international trade to arrive at trade decisions
- Explain the impact of international trade transactions on the balance of payments situation of the country
- Appreciate the need for trade barriers and regulations in conducting international trade transactions
- Outline the various ways of fixing exchange rates and how to reduce foreign exchange exposures
- Identify the risks in international trade to manage them for enhanced operational efficiency

18.3 Theories of International Trade

One important stimulant for integration of financial markets was the increase in trade among different countries. Trade theories explain characteristics of trading countries and from that they answer the following questions:

- Why a country engages in international trade?

- Why a country specializes in a certain kind of commodity exports or imports?
- What are the effects of trade on the domestic economy?
- Why is the intensity of trade more between any pair of countries?
- Should a country promote exports and avoid imports?

A number of theories have been propounded to analyze the reasons for development of international trade. Some of the major theories to be explained in the following pages are as follows:

18.3.1 Theory of Absolute Advantage

In 1776, Adam Smith proposed that international trade takes place because one country may be more efficient in producing a particular good than another country and that other country may be capable of producing some other good more efficiently than the first one. This provides an incentive to trade as both the countries can benefit from specialization and the resultant increase in productivity.

There are certain limitations to this theory.

- Firstly, it explains the causes of trade between two countries only in those situations, where both the countries enjoy absolute advantage in the production of at least one product.
- Secondly, it assumes that the transportation costs involved in selling a commodity in a country other than the one in which it was produced are either non-existent or insignificant when compared to the degree of comparative advantage. This may not always hold good.
- Another assumption of the model is that prices are comparable across countries, implying stability of exchange rates.
- Lastly, the theory assumes mobility of labor between products. In reality, Labor may be mobile, but only to an extent. The kind of adaptability required for labor to be perfectly mobile cannot actually exist.

18.3.2 Theory of Comparative Advantage

According to the theory of comparative advantage, propounded by the English economist David Ricardo in 1817, trade is possible as long as the country experiencing the disadvantage is not equally less efficient in producing all the products, i.e., both the countries enjoy comparative advantage in at least one of the products.

While explaining the theory of comparative advantage, David Ricardo made certain implicit assumptions such as perfect competition in both the countries**,** productivity of labour is constant, there is full employment in both the countries, labor is perfectly mobile between various sectors, but perfectly immobile between countries and no technological innovation takes place in any of the economies.

In the above mentioned scenario, each country should produce that goods in which it has a comparative advantage. Specialization reduces the cost of production and increases standard of living of the people.

Example: Comparative Advantage between India and Saudi Arabia Trade

India exported IT software more than what Saudi Arabia exported oil as it has comparative advantage in IT sector. A survey carried out by the RBI in September 2021 indicated that exports of software services from 5.8 million developers in India delivered US$ 148.3 billion in March, 2021 which was more than US$145.3 billion, the oil sales in Saudi Arabia. The comparative advantage of India was that the IT software was way cheaper in India than in the US or Europe. The exports to US which was the major destination for software accounted for 54.8% in 2021 and Europe had 30.1% share.

Each country should produce those goods in which it has a comparative advantage thereby reducing the cost of production and increasing the standard of living of the people.

Source: https://levelup.gitconnected.com/software-is-the-new-oil-4a698409f296 dated 7th February, 2022. Accessed on 15.07.22.

18.3.3 Heckscher-Ohlin Model

The Heckscher-Ohlin Model developed by Eli Heckscher and Bertil Ohlin in the 1920s, explores the possibility of two nations operating at the same level of efficiency, benefiting by trading with each other. Following are the assumptions of the model:

i. No obstructions to trade (for example, trade controls, transport costs).

ii. Both commodity and factor markets are perfectly competitive.

iii. There are constant or decreasing returns to scale.

iv. Both the countries have the same technology and hence operate at the same level of efficiency.

v. There are two factors of production – labor and capital. Both are perfectly immobile for inter-country transfers, but perfectly mobile for inter-sector transfers.

According to this theory, there are two types of products – labor intensive and capital intensive. The labor-rich country is more likely to produce labor-intensive goods and the country rich in capital will most probably produce capital-intensive goods. The two countries will then trade these goods and reap the benefits of international trade. The Heckscher-Ohlin model is also not free from drawbacks. Its major drawback is that it assumes that factor endowments are given, whereas they can also be developed through innovation.

18.3.4 Imitation-Gap Theory

This theory, given by Posner, considers the possibility of trade between two countries having similar factor endowments and consumer tastes. According to this theory, improvement in technology is a continuous process, and the resulting inventions and innovations in existing products, give rise to trade between such countries.

The degree of trade between such countries will depend upon the difference between the demand lag and the imitation lag. Demand lag is the difference between the time a new or an improved product is introduced in one country and the time when consumers in the other country start demanding it. Imitation lag is the difference between the time of introduction of the product in one country and the time when the producers in the other country start producing it.

18.3.5 International Product Life Cycle Theory

The International Product Life Cycle (IPLC) theory, given by Vernon, explains the various stages in the life of a new product and the resultant international trade. Two important factors, called technological innovation and market structure, are considered for this purpose. The important principles of this theory are:

- New products are developed as a result of technological innovations.
- Trade patterns are determined by the market structure and the phase in a new product's life.

According to this theory, innovations are generally concentrated in the richer, more developed countries. A new product, is produced and exported by the country which innovated it. In the second stage of the life of the product, production may shift to other developed countries where the factors required are in abundance and thus offer a cost advantage. In the third and the final stage, production shifts to less developed countries. This process results in the originally exporting country becoming the importer.

18.4 Growth of International Trade

Trade among nations induces countries to specialize in particular products or in particular varieties of some products. This results in a more efficient allocation and utilization of world resources. As the producers benefit from specialization, and economies of scale, as the consumers get a wider range of products to choose from, the economic activity increases, thus giving a push to economic growth, the world over. Countries have been trading with each other for several centuries, but as they began to appreciate the above-mentioned fact, international trade started growing by leaps and bounds. There have been times when countries showed a reduced interest in such trade and adopted various measures to protect their domestic industries, which hampered growth. These protectionist measures were introduced for tiding over temporary difficulties such as the Great Depression of

1930s, rather than out of any general disinclination towards trade. In fact, during the last half-a-century, international trade has grown at a rate faster than that of the GDPs of the countries involved. As a result, exports as a percentage of GDP have increased dramatically for a number of countries.

World Economic Outlook Update, July 2021[8]

The global economy is projected to grow 6.0 percent in 2021 and 4.9 percent in 2022.The 2021 global forecast is unchanged from the April 2021 WEO, but with offsetting revisions. Prospects for emerging market and developing economies have been marked down for 2021, especially for Emerging Asia. By contrast, the forecast for advanced economies is revised up. These revisions reflect pandemic developments and changes in policy support. The 0.5 percentage-point upgrade for 2022 derives largely from the forecast upgrade for advanced economies, particularly the United States, reflecting the anticipated legislation of additional fiscal support in the second half of 2021 and improved health metrics more broadly across the group.

Example: Global Trade Hits Record High of $28.5 Trillion in 2021

UNCTAD's Global Trade Update published a report on world trade on 17th February, 2022. The report stated that in 2021, world trade in goods remained strong and trade in services returned to its pre-COVID-19 levels. In terms of amount, the value of global trade touched $28.5 trillion in 2021 registering an increase of 25% over 2020 and 13% higher over 2019. Meanwhile, trade in services rose by $50 billion to reach $1.6 trillion.

The report further added that trade in goods increased more strongly in the developing world than in developed countries while exports of developing countries were about 30% higher in 2021 over 2020 as against 15% for developed nations.

Source: https://unctad.org/news/global-trade-hits-record-high-285-trillion-2021-likely-be-subdued-2022 dated 17th February, 2022. Accessed on 15.07.22.

18.5 Trade Barriers

As explained in the above paragraph, countries sometimes resort to adoption of protectionist measures to protect the domestic industry. These measures are referred to as "barriers". A finance manager dealing in foreign trade needs to be aware of such barriers as they impact the trading with the countries. International trade barriers can be classified into two kinds: 1. Tariff and 2. Non-tariff barriers.

18.5.1 Tariff Barriers

Tariff is a tax levied on goods traded internationally. When imposed on goods being brought into the country, it is referred to as an import duty. Import duty is levied to increase the effective cost of imported goods in order to increase the

[8] *https://www.imf.org/en/publications/weo*

demand for domestically produced goods. Another type of tariff, less frequently imposed, is the export duty which is levied on goods being taken out of the country, to discourage the export of those goods. This may be done if the country is facing a shortage of that particular commodity or if the government wants to promote the export of that goods in some other form, for example, in a processed form rather than in the form of raw material. It may also be done to discourage exporting of natural resources. When imposed on goods passing through the country, the tariff is called transit duty. Tariff can be imposed on three different bases. A specific duty is a flat duty based on the number of units, regardless of the value of the goods. Over the last few decades, tariffs have been losing their importance as barriers to trade, their place being taken by non-tariff barriers.

Example: India's High Import Tariffs in Electronics Sector

In the electronics sector, India's import tariffs were higher compared to countries like China and Vietnam and this was negating the support provided through PLI schemes and was adversely impacting competitiveness as per a report by ICEA.

The report included a comparative study of 120 tariff lines of electronics priority products in India vis-a-vis four countries -- China, Vietnam, Thailand and Mexico. Of the 120 lines, India had zero tariffs on 32 and the rest are charged with high tariffs, while it was zero tariff for 53 lines in China and 74 lines in case of Mexico. For non-zero tariffs, India's tariffs were higher for more than 85 per cent compared to other countries.

The imports constituted 80 per cent of the cost of mobile phones which was India's largest produce out of the USD 75 billion electronics sector.

Import duty is levied to increase the effective cost of imported goods in order to have a level playing field with domestic goods.

Source: https://economictimes.indiatimes.com/industry/cons-products/electronics/indias-high-import-tariffs-in-electronics-sector-negating-pli-impacting-competitiveness-report/articleshow/88734024. cms?from=mdr dated 6th January, 2022. Accessed on 16.07.22.

18.5.2 Technical Barriers

Countries generally specify some quality standards to be met by imported goods for various health, welfare and safety reasons. This facility can be misused for blocking the import of certain goods from specific countries by setting up of such standards which deliberately exclude these products. The process is further complicated by the requirement that testing and certification of the products regarding their meeting the set standards be done only in the importing country. These testing procedures being expensive, time consuming, and cumbersome to the exporters, act as a trade barrier. Under the new system of international trade, trading partners are required to consult each other before fixing such standards. Domestic and imported goods should be treated equally as far as testing and

certification procedures are concerned. There should be no disparity between the quality standards required to be fulfilled by these two. The importing country is now expected to accept the testing done in the exporting country.

18.5.3 Procurement Policies

Governments quite often follow the policy of procuring their requirements (including that of government-owned companies), only from local producers, or at least extend some price advantage to them. This closes a big prospective market to the foreign producers.

18.5.4 International Price Fixing

Some commodities are produced by a limited number of producers scattered around the world. In such cases, these producers may come together to form a cartel, and limit the production or price of the commodity, so as to protect their profits. OPEC (Organization of Petroleum Exporting Countries) is an example of such cartel formation. This artificial limitation on the production and price of the commodity makes international trade less efficient than it could have been.

18.5.5 Exchange Controls

Controlling the amount of foreign exchange available to residents for purchasing foreign goods domestically or while travelling abroad is another way of restricting imports.

18.5.6 Direct and Indirect Restrictions on Foreign Investments

A country may directly restrict foreign investment to some specific sectors or up to a certain percentage of equity. Indirect restrictions may come in the form of limits on profits that can be repatriated or prohibition of payment of royalty to a foreign parent company. These restrictions serve to discourage foreign producers from setting up domestic operations. Foreign companies are generally interested in setting up local operations, if they foresee increased sales or reduced costs as a consequence. Restrictions against foreign investment, thus, act as an impediment to international trade by giving rise to inefficiencies.

18.5.7 Customs Valuation

There is a widely held view that the invoice values of goods traded internationally do not reflect their real cost. This gave rise to a very subjective system of valuation of imports and exports for levy of duty. If the value attributed to a particular product would turn out to be substantially higher than its real cost, it could result in affecting its competitiveness by increasing the total cost to the importer due to the excess duty. This would again act as a barrier to international trade. This problem has now been considerably reduced due to an agreement between various countries regarding the valuation of goods involved in cross-border trade.

18.5.8 Transportation Costs

These costs act as another trade barrier. The cost of moving goods from one market to another has the same effect as tariffs. While tariffs are imposed by governments, transportation costs act as natural barriers to trade.

18.6 Regulation of International Trade

Free Trade refers to the conduct of international trade without any barriers imposed by any country. There is a broad consensus among economists that free trade promotes economic growth. However, inspite of this positive outcome, most countries today adopt some or the other form of protectionism as explained in the above sub-topic. The reasons for such protectionist policies range from protection of the domestic industry and economy to that of countering colonialism. Trade barriers are segregated into tariff and non-tariff barriers. While trade barriers have been explained above, this section deals with an important form of non-tariff barrier – quotas. Understanding the difference between the two types of barriers is essential for any person to be familiar with international trade.

Any kind of trade barrier hampers the efficient allocation of resources, and reduces the achievable level of standard of living. Both quotas and tariffs cause this to happen. Yet, there are some differences between the two. The imposition of a tariff generates revenue for the government, which could be used to reduce other taxes or for other welfare activities, and thus negate the harmful effect of tariffs on consumers to some extent. In the case of a quota being imposed, the only beneficiaries would be the importers who are able to get hold of an import licence. Secondly, quotas are enforced by allowing imports only against import licences, which are issued on a selective basis. Since the basis of selection for the grant of import licences is rarely clear, it leaves scope for manipulation. In this aspect, a tariff is better than a quota as it is a more transparent mechanism. Otherwise also, importers would prefer facing a tariff rather than a quota, since a tariff would make the availability of the commodity (though at a higher price) a certainty and eliminate the ambiguity involved in a quota system. On the other hand, the local producers for whose benefit the barrier is being put up, would rather have a quota in place, since it helps them in planning for their future production levels, if they can project the future domestic demand. In case of a tariff, the future movements in the world prices, and the elasticity of demand for imported goods would also have to be estimated, which would prove to be a much more difficult exercise. When some foreign producer is found to be dumping some particular good, i.e., selling it at a price that does not even cover his costs (this may be done to secure a foothold in the market), anti-dumping duty may be levied.

Example: India Restricts Sugar Exports at 10 Million Tonnes

Government imposed restrictions on sugar exports by capping at 10 million tonnes, to prevent a surge in domestic prices after mills sold a record volume on the world market. The government also asked exporters to seek its permission for any overseas shipments. This step was initiated to curb sugar exports and to keep a lid on local prices and ensure steady supplies in the domestic market as the government was worried about food inflation and to ensure that enough sugar remains in the country to cater to the festival season.

On the similar lines of sugar exports, India limited exports of wheat to 1.2 million tonnes from complete ban on wheat exports.

Quotas are government-imposed limit on the quantity or the value of the goods or services that may be exported or imported over a specified period of time in international trade.

Sources: (i) https://www.reuters.com/markets/us/india-restricts-sugar-exports-first-time-6-years-government-order-2022-05-24/ dated 25th May, 2022

(ii) https://www.reuters.com/world/india/india-could-soon-allow-wheat-exports-12-mln-t-government-trade-sources-2022-06-08/ dated 8th June, 2022. Accessed on 16th July, 2022.

Check Your Progress - 1

1. Who amongst the following proposed the Imitation-gap theory?
   a. Bertil Ohlin
   b. David Ricardo
   c. Vernon
   d. Posner
   e. Adam Smith
2. Which of the following is not an assumption made by David Ricardo?
   a. Flexible wages
   b. Full employment
   c. Perfect competition
   d. Mobility of labor
   e. Technological innovation
3. Which of the following duties is levied on goods taken out of the country?
   a. Import duty
   b. Foreign duty
   c. Export duty
   d. Specific duty
   e. Compound duty
4. Which of the following theories of International Trade dealt with labor-intensive and capital-intensive products?
   a. Theory of absolute advantage
   b. Theory of comparative advantage

c. Heckscher-Ohlin model
d. Imitation-Gap theory
e. International product life cycle theory

5. What is the duty levied when some foreign producer is found to be selling goods at a price that does not even cover his costs?
   a. Import duty
   b. Export duty
   c. Anti-dumping duty
   d. Quota
   e. Non-tariff barriers

18.7 Balance of Payments

To forecast the level of exchange rate, we need to know the factors that affect the demand for and supply of a currency. Any factor increasing the supply of a currency reduces its price, i.e., causes it to depreciate and vice versa. Similarly, any factor increasing the demand for a currency, increases the price of that currency, i.e., causes it to appreciate and vice versa. All these factors are reflected in the Balance of Payments (BoP) account.

The BoP account is the summary of the flow of economic transactions between the residents of a country and the Rest of the World (RoW) during a given time period. Economic transactions include all those activities whereby two entities exchange something of economic value. In each transaction, at least two parties must be involved either in reality, or by implication. The BoP is for a country what a statement of sources and uses of funds are for a company.

Example: India's Balance of Payments Slips into Deficit

India's Balance of Payments (BoP) slipped into a deficit of $16 billion in the January-March quarter of FY22 as against a surplus of $0.47 billion. Over the last thirteen quarters, BoP was in surplus. One of the components of BoP, the current account had slipped in deficit to $13.4 billion leading to BoP entering red zone. Another reason for BoP entering red zone was the withdrawal of foreign portfolio investors to the extent of $15.2 billion in the fourth quarter of FY22. Further FDI was the lowest in the past three years, though it was high compared to FDI inflows in other countries during the same period. All these factors led to deficit BoP.

BoP is the summary of the flow of economic transactions between the residents of a country and the rest of the world during a given time period

Source: https://www.cnbctv18.com/economy/indias-balance-of-payments-slips-into-deficit-for-first-time-in-13-quarters-what-does-this-mean-for-the-economy-13972952.htm dated 29th June, 2022. Accessed on 16th July, 2022.

18.7.1 Concept of Balance of Payments

Balance of Payments is described by the IMF in its Balance of Payments Manual as a statistical statement for a given period showing –

a. Transactions in goods, services and income between an economy and the rest of the world;
b. Changes of ownership and other changes in the economy's monetary gold, Special Drawing Rights (SDRs), and claims and liabilities to the rest of the world; and
c. Unrequired transfers and counterpart entries that are needed to balance, in the accounting sense, any entries for the foregoing transactions and changes which are not mutually offsetting.

Thus, the Balance of Payments (BoP) is a systematic record of all economic transactions between the 'residents' of a given country and the residents of other countries – the rest of the world – carried out in a specific period of time, usually a year.

18.7.2 Concepts and Principles behind Compilation of BoP Account

IMF prescribes that all economic transactions between residents and non-residents be recorded in the BoP. An entity is said to be a resident of that economy with which it has closer links than any other economy. All entities other than those which qualify as residents are considered as non-residents.

Every year, a large number of transactions enter the BoP account of each country. To make the data comparable across countries and over a period of time, it is essential that a uniform system be adopted for valuing these transactions. The IMF manual recommends the following principles to be followed for valuation of transactions entering the BoP account:

a. The transactions should be valued at market prices. For this purpose, the manual describes market price as "the amount of money that a willing buyer pays to acquire something from a willing seller, when such an exchange is one between independent parties into which nothing but commercial considerations enter".
b. Both imports and exports should be valued at f.o.b. basis (i.e., free on board basis). This means that the price paid for the insurance and shipment of goods should not be included as a part of the value of goods either by the importer or the exporter, but should be recorded separately as a payment for services (wherever paid to a foreign agency).
c. Any transaction denominated in a foreign currency should be converted into the domestic currency at the exchange rates prevailing in the market at the time of the transaction.
d. For BoP accounting, use of the double entry book-keeping system is used, i.e., every transaction has two aspects, and hence enters the BoP account twice, once as a credit and second as a debit. Since for every credit there is a corresponding debit, the balance of payments account always balances.

e. Any transaction which creates demand for the domestic currency in the forex market enters the BoP account on the credit side, and any transaction increasing its supply enters the debit side.

18.8 Components of Balance of Payments

The BoP statement is usually divided into three major groups of accounts. The construction of the accounts can best be appreciated by examining Exhibit 18.1 given below:

Exhibit 18.1: India's Overall Balance of Payments

(US$ Billion)

	July – September (2021)					
	Credit	**Debit**	**Net**			
A. Current Account	194.3	203.9	-9.6			
1. Goods	104.8	149.3	-44.4			
Of which						
POL	15.7	39.2	-23.5			
2. Services	61.4	35.8	25.6			
3. Primary Income	6.9	16.5	-9.7			
4. Secondary Income	21.2	2.2	18.9			
B. Capital Account and Financial Account	209.6	200.7	8.8			
Of which						
Change in Reserve (Increase (-) /Decrease (+))	0.0	31.2	-31.2			
C. Errors & Omissions (-) (A+B)	0.7		0.7	0.0	1.1	-1.1
P: Primary; PR: Primary Revised						
Note: Total of subcomponents may not tally with aggregate due to rounding off						

Source: https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=53015#:~:text=India's%20current%20account%20balance%20recorded,Q2%3A2020%2D21%5D. 18.8.1 Current Account Dated Dec 31, 2021

The Current Account records the transactions in merchandise and invisibles with the rest of the world. Merchandise covers exports and imports of all movable goods, where the ownership of goods shifts from residents to non-residents and vice versa. The merchandise trade exports valued on FOB (Free on Board) basis are shown as credit items, and the imports valued on CIF (Cost Insurance and Freight) basis are the debit items. However, the IMF Balance of Payments manual provides guidelines for compilation of the BoP statistics prescribing the valuation of both exports and imports on FOB basis. Therefore, the Current Account captures the effect of trade link between the economy and rest of the world.

Example: India Current Account Swings to Deficit

India's current account deficit increased to $ 13.4 billion or 1.5% of the GDP in the first quarter of 2022, as the goods gap increased to $ 54.5 billion from $ 41.7 billion a year earlier. However, there was a surplus in services to $ 28.3 billion from USD 23.5 billion, due to increased exports of computer and business services. Considering the full fiscal year of 2021-22 ending in March 2022, the current account balance recorded a deficit of 1.2% of GDP compared to 0.9% surplus in 2020-21 as the trade deficit widened to $ 189.5 billion from $ 102.2 billion a year ago. A widening CAD can be inferred as an imbalance in the economy, leading to implications on the domestic currency.

Current account is the sum of the balance of trade (exports minus imports of goods and services), net factor income (such as interest and dividends) and net transfer payments (such as foreign aid).

Source: https://tradingeconomics.com/india/current-account dated 22nd June, 2022. Accessed on 16th July, 2022.

18.8.2 Capital Account

All transactions of financial nature are entered in the Capital Account of the BoP statement. An increase (decrease) in the country's foreign financial assets is taken as debits (credits), whereas any increase (decrease) in the country's foreign financial liabilities is taken as credits (debits). The transactions under this heading are classified into five sub-heads: (i) Foreign Investment (ii) Loans, (iii) Banking Capital (iv) Rupee Debt Service and (v) Other Capital.

Any investment made by foreign residents (individuals, companies, financial institutions or even a foreign government) in the acquisition of physical assets in India is a Foreign Direct Investment. It is depicted by an inflow of foreign capital and is a credit item in the BoP statement. When a foreign country portfolio investor directly purchases financial assets in the Indian securities market, it is termed as Foreign Portfolio Investment.

Loans include concessional loans received by the government or public sector bodies, long-term and medium-term borrowings from the commercial capital market in the form of loans, bond issues, etc., and short-term credits. Disbursements received by Indian resident entities are credit items while repayments and loans made by Indians are debit items.

Banking capital covers the changes in the foreign assets and liabilities of commercial banks; whether privately owned or government owned, and co-operative banks, which are authorized to deal in foreign exchange. An increase in assets (or decrease in liabilities) is a debit item, while a decrease in assets (or increase in liabilities) is a credit item.

The item 'Rupee Debt Service' is defined as the cost of meeting interest payments and regular contractual repayments of the principal of a loan along with any administration charges in rupees by India.

Though transactions in the BoP statement are recorded according to the principle of double entry, certain discrepancies in estimation and timing may result in a situation where debits may not exactly be equal to the credits. The item 'Errors and Omissions' indicates the value of such discrepancies. A negative value indicates that receipts are overstated or payments are understated, or both, and vice versa. Persistently, large errors with the same sign are indicative of serious weaknesses in the recording of transactions or flows.

18.8.3 Monetary Movements

The monetary movements keep record of (a) India's transactions with the International Monetary Fund (IMF) and, (b) India's foreign exchange reserves which basically consist of RBI holdings of gold and foreign currency assets. Drawings (essentially a type of borrowing) from the IMF or drawing down of reserves are credit items, whereas, repayments made to IMF or additions made to existing reserves are debit items.

18.8.4 Balance in the BoP Statement

The Balance of Payments statement is prepared on the basis of the double entry system. Therefore, the statement as a whole would fully balance without any surplus or deficit. However, the BoP is not analyzed for the statement as a whole, but only for debit and credit of certain groups of items whose balance has certain significant implications.

Trade Balance

The trade balance is the difference between exports and imports of merchandise. Trade balance would be an important indicator of income and outgo, if the imports and exports of services are not significant. Changes in trade balance indicate changes in the efficiency of the country in producing and exporting goods in which it enjoys comparative advantage. The demand for the products of a country, other things remaining equal, depends on its relative efficiency in producing goods.

Current Account Balance

An important implication of current account balance, viewed from the national income accounting approach, is that it represents the difference between domestic saving and domestic investments in a given year. A deficit on current account means that domestic saving is insufficient to fund domestic investment, resulting in import of savings from abroad. If domestic savings exceed domestic investments a surplus on current account will result and would make the BoP situation more comfortable. The current account balance indicates the country's stock of net international assets.

Capital Account Balance

The balance in the capital account indicates how the balance in the current account has been financed. If one can distinguish between long and short-term sources, one can comment upon the financing methods adopted by the country. Similarly, distinction has to be made between finances obtained on commercial terms and on soft terms. The larger the former component, the greater the vulnerability of the country to volatility in interest rates.

18.9 Factors affecting the Components of BoP Account

We have seen that a BoP account consists of a current account balance, capital account balance and change in reserves and errors and omissions. There are several factors that impact the balances in these accounts.

As the BoP is one of the macro economic factors that determine the health of an economy, understanding the impact of various changes in inflows and outflows due to international transactions that trigger changes in BoP is very important.

18.9.1 Exports of Goods and Services

Exports of goods and services are affected by the following factors:

- **The Prevailing Exchange Rate of the Domestic Currency:** A lower value of the domestic currency results in the domestic price getting translated into a lower international price. This increases the demand for domestic goods and services, and hence their export. This is likely to result in a higher demand for the domestic currency. A higher exchange rate would have an exactly opposite effect.

Example: India Registers Positive Growth in Exports

India's overall exports in June 2022 were estimated to be $ 64.91 billion, showing a positive growth of 22.95% over the same period last year while at the same time, for the 1st quarter of the FY22-23, the overall exports were estimated to be $ 235.11 billion, exhibiting a positive growth of 49.41 per cent over the same period last year. During the same period, ₹ became weaker from ₹ 76.52 / $ in April 22 to ₹ 78.95 in June 22. A higher exchange rate increased the exports since the exports were in $ and receipts in ₹ after conversion will be higher and a motivating factor for the exporters.

BoP determines the health of an economy and is impacted by changes in inflows and outflows due to international transactions and one such factor is exports of goods and services.

Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1841477 dated 14th July, 2022. Accessed on 16th July, 2022.

- **Inflation Rate:** The inflation rate in an economy vis-à-vis other economies affects the international competitiveness of the domestic goods and hence

their demand. The higher the inflation, the lower the competitiveness and the lower the demand for domestic goods. Yet, a lower demand for domestic goods and services need not necessarily mean a lower demand for the domestic currency. If the demand for domestic goods is relatively inelastic, then the fall in demand may not offset the rise in price completely, resulting in an increase in the value of exports. This would end up increasing the demand for the local currency.

- **World Prices of a Commodity:** If the price of a commodity increases in the world market, the value of exports for that particular product shows a corresponding increase. This would result in an increase in the demand for the domestic currency. A fall in the demand for domestic currency would be experienced in case of a reduction in the international price of a commodity.
- **Incomes of Foreigners:** There is a positive correlation between the exports and the incomes of the residents of an economy to which the domestic goods are exported. Hence, other things remaining the same, an increase in the standard of living (and hence, an increase in the incomes of the residents) of such an economy will result in an increase in the exports of the domestic economy. Once again, this would increase the demand for the local currency.
- **Trade Barriers:** The higher the trade barriers erected by other economies against the exports from a country, the lower will be the demand for its exports, and hence for its currency.

18.9.2 Imports of Goods and Services

Imports of goods and services are affected by the same factors that affect their exports. While some factors have the same effect on imports as on exports, some of them have an exactly opposite effect. Let us analyze these latter factors and their effects:

- **Value of the Domestic Currency:** An appreciation of the domestic currency results in making imported goods and services cheaper in terms of the domestic currency, hence increasing their demand. The increased demand for imports results in an increased supply of the domestic currency. A depreciation of the domestic currency has an opposite effect.
- **Level of Domestic Income:** An increase in the level of domestic income raises the demand for all goods and services, including imports. This again results in an increased supply of the domestic currency.
- **International Prices:** The international demand and supply positions determine the international price of a commodity. A higher international price would get translated into a higher domestic price. If the demand for imported goods is inelastic, this would result in a higher domestic currency value of imports, increasing the supply of the domestic currency. In case of the

demand being elastic, the effect on the supply of the domestic currency would depend on the effect on the domestic currency value of imports.

- **Inflation Rate:** A domestic inflation rate that is higher than the inflation rate of other economies, would result in imported goods and services becoming relatively cheaper than domestically produced goods and services. This would increase the demand for the former and hence, the supply of the domestic currency.
- **Trade Barriers:** Trade barriers have the same effect on imports as on exports –the higher the barriers, the lower the imports and hence, the lower the supply of the domestic currency.

18.9.3 Income on Investments

Both payments and receipts on account of interest, dividends, profits etc., depend on the level of past investments and the current rates of return that can be earned in an economy. For payments, it is the level of past foreign investments and the current domestic rates of return; while for the receipts, it is the past domestic investments in foreign economies and the current foreign rates of return which are relevant.

18.9.4 Transfer Payments

Transfer payments are broadly affected by two factors. One is the number of migrants to or from a country, who may receive money from or send money to relatives. The second is the desire of a country to generate goodwill by granting aids to other countries along with the economic capability to do so, or its need to take aids and grants from other countries to tide over difficulties.

18.9.5 Capital Account Transactions

Four major factors affect international capital transactions. The foremost is the rate of return which can be earned on the investments as compared to the returns that can be earned on domestic investments. The higher the differential returns offered by a country, the higher will be the capital inflows. Another factor is the additional risk that accompanies these returns. The more the risk, the lower the capital inflows. Diversification across countries may offer some extra benefit in addition to the returns offered by a particular investment. This benefit arises from the fact that different economies may be at different stages of economic cycle at a given time, thus making their performance unrelated. Higher the diversification benefits, higher the inflows. One more factor which has a very significant effect on these transactions is the expected movement in the exchange rates. If the exchange rates are quite stable, or the movement is expected to be in the investors' favor, the capital inflows will be higher.

18.10 Importance of BoP Statistics

A careful study of the factors which affects the components of the BoP and of the underlying economic factors the world over, can prove quite helpful for predicting, at least, the direction of the movement in exchange rates. A movement in the reserves position of a country can also provide some indications as to the possible movement of the exchange rate of its currency. A continuous depletion of reserves may indicate either of the following two circumstances:

i. A repeated overall BoP deficit. As outflow exceeds inflow, there would be an excess supply of the domestic currency in the forex markets, thus putting a downward pressure on its exchange rates with other currencies.

ii. There may already be a pressure on the exchange rate due to the above mentioned reason, because of which the official reserves may be used to defend the domestic currency. This would be done by selling the reserves in exchange for the local currency to increase the total demand for the latter, in order to prevent the exchange rate from sliding down.

Example: RBI Sells $ to Arrest ₹ Slide

The Reserve Bank of India announced a series of steps to arrest ₹ slide and boost forex inflows into the market and to begin with, it decided to enter into sell-buy swaps worth $5 billion with banks to elongate the maturity profile of its forward dollar. Though selling $ to stabilize domestic currency was not a good proposition, RBI adopted this position few times earlier as an urgent step.

Sometimes official reserves may be used to defend the domestic currency.

Source: https://timesofindia.indiatimes.com/topic/rbi-sells-dollars-to-arrest-rupees-slide/news dated 7th July, 2022. Accessed on 16th July, 2022.

18.11 Limitations of Balance of Payments

While understanding the significance of BoP statistics and using such statistics in decisions related to foreign trade, it is also required to look at the limitations that this account suffers from. Such limitations are:

- Though BoP statistics are very helpful in predicting movements in the exchange rates, they are more useful for estimating general trends rather than the specific levels at which the exchange rates would stabilize.
- Besides, care has to be taken while interpreting BoP data. All the different balances (current account balance, capital account balance, overall balance) should be considered, along with the actual and expected trends in these balances and the expected developments in the international scene.
- The BoP data for one country can only give an idea as to whether that country's currency is likely to increase or decline in value. It would not help in predicting the currency's movement with respect to a particular currency.

That movement can be estimated only if the BoP data for both the countries are studied together.

Example: BoP Crisis in Pakistan

Pakistan's economy was stuck in a balance of payments crisis primarily due to swelling import payments, very few exports and debt repayments and needed immediate and extraordinary measures to get rid of the quagmire and approaching IMF was not a solution according to the economists.

The BoP Deficit in India – This was due to widening of trade deficit in spite of increased exports on services.

BoP Crisis in Sri Lanka and Nepal - Both these countries were facing BoP crisis due to debt repayments. Further, there was no income from tourism which was the main source of forex inflow.

Thus the BoP of one country cannot be applicable with other country.

Sources (i) https://tribune.com.pk/story/2355698/how-to-steer-out-of-bop-crisis dated 9th May, 2022.

(ii) https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=53015 dated 31st December, 2022. Accessed on 16th July, 2022.

18.12 International Finance

When a firm operates only in the domestic market, both for procuring inputs as well as selling its output, it needs to deal only in the domestic currency. As companies try to increase their international presence, either by undertaking international trade or by establishing operations in foreign countries, they start dealing with people and firms in various nations. Since different countries have different domestic currencies, the question arises as to which currency should the trade be settled in. The settlement currency may either be the domestic currency of one of the parties to the trade, or may be an internationally accepted currency. This gives rise to the problem of dealing with a number of currencies. The mechanism by which the exchange rate between these currencies (i.e., the value of one currency in terms of another) is determined, along with the level and the variability of the exchange rates, can have a profound effect on the sales, costs, and profits of a firm. The exchange rates have a great impact on the various financial decisions, and their movements can alter the profitability of these decisions. Thus, there is a need to study international finance.

18.12.1 Meaning and Implications of Globalization

Globalization means the various domestic markets getting integrated across geographical boundaries. Globalization makes companies to become competitive globally in order to survive. Knowledge and understanding of different countries' economies and their markets is a must for establishing oneself as a global player. Studying international finance helps a finance manager to understand the

complexities of the various economies. It can help him understand as to how the various events taking place world over are going to affect the operations of his/her firm. It also helps him to identify and exploit opportunities, while preventing the harmful effects of international events. A thorough understanding of international finance will also assist the finance manager in anticipating international events and analyzing their possible effects on business firm. It helps to maximize profits from opportunities and minimize losses from events which are likely to affect the firm's operations adversely.

International finance is also required for domestic companies because, some of their inputs (raw materials, machinery, technological know-how, capital, etc.), may be imported from other countries, thus exposing them to the risks involved in dealing with foreign currencies. Even if they do not source anything from outside their own country, they may have foreign companies competing with them in the domestic market. In order to understand their competitors' strengths and weaknesses, awareness and understanding of international events again gains importance.

18.12.2 Integration of Financial Markets

Integration of financial markets is advocated as it provides the freedom and opportunity to raise funds from and to invest anywhere in the world, through any type of instrument. As a result of integration, anything affecting the financial markets in one part of the world automatically and quickly affects those in the rest of the world also. This is known as the Transmission Effect. The higher the integration, the greater is the transmission effect. Let us look at the reasons for this integration.

Example: Impact of Spike in US Inflation on India's Equity Markets

Indian markets were totally integrated with world markets. The following situation proved the statement.

Indian equity markets were under heavy selling pressure due to sell off on Wall Street as US Federal Reserve embarked on a monitory tightening by raising interest rate to curb inflation by 75 basis points. The US inflation touched 7.5% which was a 40-year high according to various reports. This had adverse impact on the global markets as well as Dew Jones industrial average fell by 1.4%, Sensex lost 900 points, S&P 500 lost 1.8%, Nasdaq dropped by 2.1% etc.

The higher the integration of financial markets, the greater is the transmission effect

Source: https://timesofindia.indiatimes.com/business/india-business/why-a-spike-in-us-inflation-has-spooked-indias-equity-markets-today/articleshow/89498818.cms dated 11th February, 2022. Accessed on 16th July, 2022.

Reasons

A number of factors are behind integration of financial markets.

- The most important reason is the remarkable development of technology for transfer of money and information, making the same possible at an extremely high speed and at considerably reduced cost. This has made possible the co-ordination of activities in various centers, even across national boundaries.
- Another significant development was the sudden increase in the inflation levels of various industrial countries. This resulted in the price of various financial assets changing widely in response to the changes in the domestic inflation rates and the interest rates in different countries.

These developments led to some others, which contributed all the more to the process of globalization and these are:

i. **The development of new financial instruments:** Instruments of the Euro-dollar market, interest rate swap, currency swap, futures contracts, forward contracts, options, etc.

ii. **Liberalization of regulations governing the financial markets:** Though the extent and direction of liberalization has been different in different countries, based on the domestic compulsions and the local perspective, it has been substantial enough to make operations in foreign markets a lucrative affair.

iii. **Increased cross penetration of foreign ownership:** This helped the countries that developed an international perspective while deciding on various factors influencing the process of globalization.

Benefits

The function of the financial system is to efficiently transfer resources from the surplus units to the deficit units. Greater integration of the financial markets helps in performing this function in a better manner. Capital-rich countries generally enjoy a lower return on capital than the capital-poor countries. When capital flows are allowed to take place, investors from the capital-rich countries would invest in the high-yielding projects available in the capital-poor countries. The capital poor countries get cash flows to develop their respective economics. This would benefit both the countries. The residents of the capital-rich country will benefit by earning a higher return on their investments, and the cash-poor country will benefit by earning profits on the project. Integration of financial markets thus results in a more efficient allocation of capital and a better working financial system. Through this integration, it is possible to enjoy the benefits of diversification. Just as diversification across various securities makes higher returns at the same risk-level (or same returns at a reduced risk-level) possible, diversification across borders also gives investors the same opportunity, by providing additional securities as well as an economic environment different from the one within the country.

Costs

It is a well-known fact that risks and rewards go hand-in-hand. Accordingly, integration of the financial markets also involves taking some additional risks – currency risks and country risks. Currency risk denotes the risk of the value of an investment denominated in some other country's currency, coming down in terms of the domestic currency. It also denotes the risk of the value of a foreign liability increasing in terms of the domestic currency. These could happen due to a change in the exchange rates.

Country risk is the risk of not being able to disinvest at will due to countries suddenly changing their attitude towards foreign investment, or due to some other factors like war, revolution, etc. Governments may suddenly change their policies regarding allowing non-residents to invest in certain areas, or repatriating their profits, or some other factor affecting the returns of the foreign investors.

Effects

The most important and visible effect of globalization and integration of financial markets is the increase in volatility. Whether it be interest rates, exchange rates or prices of financial assets, all of them change quite frequently in response to various changes taking place in different segments of the financial markets all over the world. Such change gets reflected in exchange rates before getting reflected in interest rates. Further, with the de-regulation of the financial markets the world over, the control of the authorities on these variables has reduced to a great extent, thus exposing a firm to a number of risks, hitherto unknown. In this changed scenario, learning international finance (of which exchange risk management and interest risk management are an integral part) becomes essential for a finance manager.

18.13 International Monetary System

As a result of international trade and integration of financial markets, people and firms are entering into more and more cross-border financial deals. In order to make these transactions feasible, a system for determination of the amount and method of payment of the underlying financial flows is needed. Since the domestic currencies of the parties involved will be different, the flows will take place in some mutually acceptable currency. The parties involved will then need to convert the amount involved into their domestic currencies. The set of rules, regulations, institutions, procedures, practices, and mechanisms that determine the rate (called the exchange rate) at which this conversion takes place, and the movements in the exchange rate over a period, is called the international monetary system.

18.13.1 Exchange Rate Mechanisms

The exchange rate is formally defined as the value of one currency in terms of another. There are different ways in which the exchange rates can be determined.

Exchange rates may be fixed, floating, or with limited flexibility. Different systems have different methods of correcting the disequilibrium between international payments and receipts.

Fixed Exchange Rate System

As the name suggests, under a fixed (or pegged) exchange rate system, the value of a currency in terms of another is fixed. These rates are determined by governments or the central banks of the respective countries. The fixed exchange rates result from countries pegging their currencies to either some common commodity or to some particular currency. There is generally some provision for correction of these fixed rates in case of a fundamental disequilibrium. Examples of this system are – the gold standard and the Bretton Woods system. The particular variations of the fixed rate system are:

Currency Board System

Under the currency board system, a country fixes the rate of its domestic currency in terms of a foreign currency. Its exchange rate in terms of other currencies depends on the exchange rates between the other currencies and the currency to which the domestic currency is pegged. Due to the pegging, the monetary policies and economic variables of the country of the reference currency are reflected in the domestic economy.

The currency board does not have any discretionary powers over the monetary policy and also is not allowed to print unlimited amount of domestic currency. The board does not lend to even the domestic banks as it cannot act as the lender of last resort.

The biggest advantage of a currency board system is that it offers stable exchange rates, which act as an incentive for international trade and investment. The discipline enforced on the government and the financial system also helps in improving the macro-economic fundamentals in the long run. Among the drawbacks, the foremost is the loss of control over interest rates. The equilibrium in the forex markets is established at the point where the domestic interest rates in the economy are in accordance with the underlying economic fundamentals of the domestic and the anchor currency economy, and the fixed exchange rate. A high inflation in the domestic markets can result in low or even negative real interest rate.

Target Zone Arrangement

A group of countries sometimes get together and agree to maintain the exchange rates between their currencies within a certain band around fixed central exchange rates. This system is called a target zone arrangement. Convergence of economic policies of the participating countries is a prerequisite for the sustenance of this system. An example of this system is the European Monetary System under which 12 countries came together in 1979, and attempted to maintain the exchange rates

of their currencies with other member countries' currencies within a fixed band, around the central exchange rate.

Monetary Union

Under this system, a group of countries agree to use a common currency, instead of their individual currencies. This eliminates the variability of exchange rates and the attendant inefficiencies completely. The economic variables of the member countries have to be quite proximate for the system to be viable. An independent, common Central Bank is set-up, which has the sole authority to issue currency and to determine the monetary policy of the group as a whole. The member countries lose the power to use economic variables like interest rates to adjust their economies to the phase of economic cycle they experienced. As a result, the region as a whole experiences the same inflation rate. This is the most extreme form of management of exchange rates. An example of a monetary union is the European Monetary Union which is an economic union of 28 member countries (excluding Britain which exited the union in 2016). It has a single market with free movement of people, goods and services and is represented by a single currency unit 'The Euro' (refer to sub-topic 18.15).

Floating Exchange Rate System

Under this system, the exchange rates between currencies are variable. These rates are determined by the demand and supply for the currencies in the international market. These, in turn, depend on the flow of money between the countries. The flow of money may occur either due to international trade in goods or services, or due to purely financial flows. Hence, in case of a deficit or surplus in the balance of payments, the exchange rates get automatically adjusted and this leads to a correction in the imbalance. Floating exchange rates can be of two types: 1. Free Float and, 2. Managed Float.

Free Float

The exchange rate is said to be freely floating when its movements are totally determined by the market. There is no intervention at all either by the government or by the central bank. The current and expected future demand and supply of currencies change on a day-to-day basis; even a moment-to-moment basis, as the market receives, analyzes and reacts to economic, political, and social news. This, in turn, changes the equilibrium in the currency market and the exchange rate is determined accordingly.

Managed Float

When the central bank intervenes in the currency market, it is called managed float. This management of exchange rates can take three forms:

i. The central bank may occasionally enter the market in order to smoothen the transition from one rate to another, while allowing the market to follow its own trend. The aim may be to avoid fluctuations, which may not be in

accordance with the underlying economic fundamentals and speculative attacks on the currency.

ii. Some events are liable to have only a temporary effect on the markets. In the second variation, intervention may take place to prevent these short-and medium-term effects, while letting the markets find their own equilibrium rates in the long-term, in accordance with the fundamentals.

iii. In the third variation, though officially the exchange rate may be floating, in reality the central bank may intervene regularly in the currency market, thus unofficially keeping it fixed.

Hybrid Mechanism: Crawling Peg

A crawling peg system is a hybrid of fixed and flexible exchange rate systems. Under this system, while the value of a currency is fixed in terms of a reference currency, this peg itself keeps changing in accordance with the underlying economic fundamentals, thus letting the market forces play a role in the determination of the exchange rate. There are several bases which could be used to determine the direction of the change in the exchange rate. One could be the actual exchange rate ruling in the market. Though the rate is officially fixed at a certain level, it hovers around the fixed rate in the market, and is allowed to move so, if it is not too much in divergence with the official rate. If this market determined exchange rate continuously shows a declining trend over a period, the peg is revised downwards and vice versa. Another possible base could be the recent figure for the difference between domestic inflation and the inflation rate in the anchor-currency country. The changes could even be based on the balance of trade figures or changes in the external debt of the country. The advantage of a crawling peg is that, though it gives a relatively stable exchange rate (changes in which are fairly predictable), the rate is never too much out of line with the underlying fundamentals of the economy.

Example: Hong Kong's Crawling Peg System

Hong Kong dipped into its foreign-exchange reserves to defend its longstanding dollar peg. The Chinese central bank, the Hong Kong Monetary Authority, had taken steps to stop the local currency trading beyond its permitted range of 7.75 to 7.85 Hong Kong dollars per U.S. dollar. The Hong Kong monetary authority sold U.S. dollars to buy HK$ 1.586 billion or the equivalent of about $ 202 million during New York trading hours and also sold $ 520 million during the Hong Kong day. ($ 202 + $ 520= $722)

The Hong Kong dollar was pegged to its U.S. equivalent and the monetary authority will be ready to sell U.S. dollars if the local currency gets too weak, or buy them if the Hong Kong dollar becomes too strong.

Crawling Peg is a hybrid of fixed and flexible exchange rate systems. While the value of a currency is fixed in terms of a reference currency, it keeps changing in accordance with the underlying economic fundamentals.

Source: https://www.wsj.com/articles/hong-kong-spends-202-million-to-defend-currency-peg-11652326711 dated 5th May, 2022. Accessed 16th July, 2022.

18.14 Evolution of Monetary Systems

Various variations and combinations of the above mentioned exchange rate mechanisms have been followed in the past. Since each one of them had its own unique method of correcting disequilibrium in the international monetary system, it is essential to develop an awareness of the circumstances under which they were used and the reasons why they were withdrawn. The following section thus explains the evolution of different monetary systems, their characteristics along with their correction mechanisms:

18.14.1 The Gold Standard

The gold standard was followed in its classical form from 1870 to 1914. While the United Kingdom and the United States were on the gold standard from 1821 and 1834 respectively, most of the countries had joined the system by 1870. The essential feature of this system was that governments gave an unconditional guarantee to convert their paper money or fiat money[9] into gold, at a pre-fixed rate at any point of time, on demand. The continued commitment of the governments to the guarantee, and the readiness of the people to believe it, were the reasons the system could sustain for such a long time.

The exchange rate between two currencies was determined on the basis of the rates at which the respective currencies could be converted into gold, i.e., the price of gold in the two countries. For example, if in the US the price of one ounce of gold is fixed at USD400, and in the UK it is £200, then the exchange rate (called the mint parity) between the USD and the £ would be USD2/£ (400/200). The exchange rate would stay at this equilibrium level because of the arbitrage[10] possibility involved. The gold standard was abandoned with the advent of the World War I in 1914.

18.14.2 The Gold Exchange Standard: (The Inter-War Period)

During the war (World War I) period many countries, including Britain borrowed heavily from the US to meet the expenses of food and arms. Creditor nations liquidated most of their foreign assets to finance the war and the debtor nations (mainly US) became creditors, *on balance*.[11] The war came to an end in 1918 but the exchange rates were allowed to float for some more years. In 1925, Britain adopted a modified version of gold standard at the pre-war parity, slowly followed by other countries. The need for additional liquidity was felt in the international markets. As such, under the new system, called gold-exchange standard, some countries converted their currencies into the currency of another

9 Fiat money is money which has insignificant intrinsic value, but a high face value due to the decree or fiat that it can be used for the settlement of all financial obligations.
10 Arbitrage is the process of buying and selling the same product at different prices at the same time; thus making profits due to market inefficiencies, which allow the prices in two markets to diverge.
11 The United States became, on balance, a creditor nation by the end of World War I, but only for its wartime loans to the Allies. Most of these loans were never repaid.

country on the gold standard instead of gold. Consequently, instead of holding gold reserves, the countries started holding reserves of that currency into which they had converted their currency. The Great Depression of the late 1920s proved fatal to the US and other countries. It led to low earnings, low demand and much lower employment in addition to the already existing unemployment. Unable to meet its financial obligations, Britain abandoned this system in 1931. With this move, the pressure was completely shifted to the dollar, the only currency convertible to gold. This pressure led to suspending the convertibility by US in 1933. As a result, gold-exchange standard system came to an end.

18.14.3 Bretton Woods System

The World War II effectively damaged the global economy and current accounts of most of the economies. In order to strengthen the international trade and monetary systems, representatives of 44 countries met in Bretton Woods, New Hampshire, USA, in 1944, and signed an agreement to establish a new monetary system which would address all these needs. This system came to be known as the Bretton Woods System.

The main terms of the agreement arrived at were as follows:

- Two new institutions were to be established, namely, the International Monetary Fund (IMF) and the International Bank for Reconstruction and Development (IBRD), also called the World Bank.
- A system (which came to be known as the adjustable peg system), was established which fixed the exchange rates, with the provision of changing them, if the necessity arose. Under the new system, all the members of the newly set-up IMF were to fix the par value of their currency either in terms of gold, or in terms of the US dollar. All these values were fixed with the approval of the IMF, and reflected the changed economic and financial scenario in each of the countries, and their new positions in international trade.
- Currencies were required to be convertible for trade-related and other current-account transactions, though governments were given the power to regulate capital flows. This was done in the belief that capital flows destabilize economies. For the purpose of such conversion, gold reserves were maintained by the US, and dollar reserves by other countries. As selling the local currency would result in an increase in the dollar reserves and buying it would result in a reduction in the reserves, the countries facing a downward pressure (inevitably facing a balance-of-payments deficit, as explained later) were under more pressure than countries facing an upward pressure on its currency (the ones enjoying a balance-of-payments surplus).
- The countries were allowed to revise the exchange rate up to 10% of the initially determined rate, within one year of the rates being determined. After

that period, a member country could change the original par values up to 5 per cent (on either side) without referring the matter to IMF, that too only if it's financial and economic condition made it essential

- All the member countries were required to subscribe to IMF's capital. The subscription was to be in the form of gold (one-fourth of the subscription) and its own currency (the balance). Each country's quota in IMF's capital was to be decided in accordance with its position in the world economy. This capital was needed to enable IMF to help the countries in need of reserves for defending their currency.

18.14.4 Post-Bretton Woods System (The Current System)

The Articles of IMF were amended and became effective on April 1, 1978. This was the second amendment to IMF's articles. Under the new articles, countries were given much more flexibility in choosing the exchange rate system they wanted to follow and in managing the resultant exchange rates. They could either float or peg their currencies. The peg could be with a currency, with a basket of currencies or with SDRs. The only restriction put was that the pegging should not be done with gold; neither were the member countries allowed to fix an official price for gold. This was done to reduce the role of gold and to make SDRs more popular as a reserve asset. For the same reason, the value of an SDR was redefined in terms of a basket of currency (to make it more stable and hence preferable as a reserve asset), rather than in dollar terms. The member countries were also left free to decide upon the degree of intervention required in the forex markets and could hence make it compatible with their economic policies. Secondly, IMF was given increased responsibility for supervising the monetary system. As a part of these increased responsibilities, IMF was required to identify those countries which were causing such changes in the exchange rates through their domestic economic policies, which proved disruptive to international trade and investment. It could then suggest alternative economic policies to such countries. The IMF was also responsible for identifying any country which was trying to defend an exchange rate which was inconsistent with the underlying economic fundamentals. This was to be done by a constant monitoring of the reserves position of various countries. Lastly, the new articles made it easier for countries facing short-term imbalances in their BoP accounts to access IMF's assistance.

Given the freedom, different countries chose different exchange rate mechanisms. While some of them kept their currencies floating, some of them pegged their currencies either to a single currency or to a basket of currencies. A peg was maintained by intervention in the foreign exchange markets and by regulating forex transactions. Floating of currencies was expected to make the exchange rate movements more smooth. Instead, however, a lot of volatility has since been experienced.

Example: International Monetary Fund (IMF) Allocation of SDR to India

International Monetary Fund (IMF) made an allocation of Special Drawing Rights (SDR) to around USD 17.86 billion to India on August 23, 2021. The total SDR holdings of India now stands at SDR $ 19.41 billion. This increase in SDR holdings will be reflected in the Foreign Exchange Reserves of the country.

SDR holdings was one of the components of the foreign exchange reserves of a country and IMF made SDR allocation to its members in proportion to their existing quotas in the Fund.

As per the current system, countries can choose the exchange rate system which could either float or peg their currencies with a basket of currencies or with SDRs.

Source: https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=52158 dated 1st September, 2021. Accessed on 16th July, 2022.

18.15 The European Monetary Union

A monetary union refers to a group of countries or regions that evolve a common currency and a uniform monetary policy. Such unions are preferred by countries as it enables them to reduce transaction costs in cross-border trade, facilitates foreign trade and strengthens the economy. One such union in existence today is the European Monetary Union. A study of how this union works is essential to conduct trade transactions with its member countries.

The basis of the European Monetary Union was the American desire to see a united Western Europe after the World War II. This desire started taking shape when the Europeans created the European Coal and Steel Community, with a view to freeing trade in these two sectors. The pricing policies and commercial practices of the member nations of this community were regulated by a supranational agency. In 1957, the Treaty of Rome was signed by Belgium, France, Germany, Italy, Luxembourg, and the Netherlands to form the European Economic Community (EEC), whereby they agreed to make Europe a common market. While they agreed to lift restrictions on movements of all factors of production and to harmonize domestic policies (economic, social and other policies which were likely to have an effect on the said integration), the ultimate aim was economic integration. The European countries desired to make their firms more competitive than their American counterparts by exposing them to internal competition, and giving them a chance to enjoy economies of scale by enlarging the market for all of them.

The structure of the EEC consists of the European Commission, a Council of Ministers and a European Parliament. The EEC achieved the status of a customs union by 1968. In the same year, it adopted a Common Agricultural Policy (CAP), under which uniform prices were set for farm products in the member countries, and levies were imposed on imports from non-member countries to protect the regional industry from lower external prices. An important roadblock in the

European unification was the power given to all the member countries under the treaty, by which they could veto any decision taken by other members. This hindrance was removed when the members approved the Single European Act in 1986, making it possible for a lot of proposals to be passed by weighted majority voting. This paved the way for the unification of the markets for capital and labor, which converted the EEC into a common market on January 1, 1993. Meanwhile, a number of countries joined EEC. Denmark, Ireland, and the United Kingdom joined in 1973. By 1995, Austria, Finland, Greece, Portugal, Spain, and Sweden have also joined, thus bringing the membership to 15.

The most significant development was the introduction of a single currency for the participants of the EMU – the Euro. On January 1, 1999, the Euro came into being. On this date, the exchange rates of the currencies of the participating nations with the Euro were irrevocably fixed. There was a transition period of three years during which these currencies existed along with Euro. However, after the scheduled time, all interbank payments were conducted in Euros and there was no interbank quotes between the dollar and local currencies; also all new government debt was denominated in Euros, the ECB conducted repo transactions only in Euros, and all stock exchange quotations for equities and trades and settlements of government debt and equity was in Euro. On the retail level, the bank statements and the credit card bills gave the Euro equivalents of the national currency figure. Above all, from the same date, the ECB started formulating a common economic policy for the participating nations. Between January 1, 1999, and December 31, 2002, all retail transactions were settled in the national currencies. As planned, Euro notes and coins were introduced on January 1, 2002. The next six months a dual currency period ensured in which both Euro and the national currencies were used for retail transactions. However, the use of the national currencies was to be phased out and from July 2002, Euro emerged as the only legal tender.

However, the dream of a single European currency received a severe jolt with Great Britain opting to move out of the European Union in a referendum conducted in 2016.

Brexit and European Union

The United Kingdom (UK) on 23 June 2016, voted in a referendum on the country's European Union (EU) membership, and 51.9% of voters chose the option of leaving the EU, which is referred to as Brexit. The implication of this exit from EU can be looked at from four different angles.

1. Geo political implication (Resurgence of nationalism).
2. Global economic implication (Global economic turndown and emerging market crisis)

3. Global security implication (More terrorist attacks on Europe due to increase in right wing extremism in EU)
4. European implication (Confidence in the EU's leadership, the continuing Greek debt crisis, and migration crisis.)

There would be many complex issues that the UK economy may face due to Brexit over the next decade. Many questions were asked in various forums on the implications for UK trade with the rest of the world:

- What are the costs and benefits of Brexit?
- How will Brexit affect UK foreign direct investment?
- What are the possible alternatives open to the UK once it leaves the European Union?

However, the overall macro-economic impact of Brexit is hard to quantify. This is due to the fact that there are several unknowns and macro-models which do not capture many areas through which Brexit would impact on the economy. The majority of published studies find the impact on the UK would be negative and significant. The impact on the rest of the EU would be smaller, although no comprehensive macro-economic estimate has been published. It also concludes that the impact of Brexit depends on the relationship with the EU that follows. What is most beneficial politically, in terms of policy independence, is also the most damaging economically. This is the Brexit paradox.

Example: Ireland to Receive €920m for Brexit Impact

The Republic of Ireland was to receive €920 m from a European Commission fund which was designed to mitigate the impact of Brexit. The Brexit adjustment reserve was created to support those countries in EU who were impacted due to Brexit and was made available to all EU member states. Ireland was the biggest beneficiary and the first state to benefit.

The reserve had a total budget of €5.4 bn and the Irish government received €361.5 m in 2021 and will receive €276.7 m in 2022 and €282.2 m in 2023.

Brexit is Great Britain opting to move out of the European Union based on the referendum conducted in 2016.

Source: https://www.bbc.com/news/world-europe-59547054 dated 6th December, 2021. Accessed on 16th July, 2022.

Foreign Exchange Market

The growing size and importance of international trade necessitated the creation of a well-connected market for currencies as all transactions are required to be settled in some or other form of currencies. Such a market, which deals specifically in currencies, is called the foreign exchange market.

This is an OTC (Over-the-Counter) market, i.e., there is no physical marketplace to make deals. Instead, it is a network of banks, brokers and dealers spread across the various financial centers of the world. These players trade in different currencies through (and are linked to each other) telephones, faxes, computers, and other electronic networks like the SWIFT system (Society for Worldwide Interbank Financial Telecommunications). These traders generally operate through a trading room. The deals are mostly finalized orally, with written confirmation following later.

In India, foreign exchange is defined in terms of Section 2 of FEMA, 1999 as including:

i. All deposits, credits, balances payable in any foreign currency;
ii. Any drafts, travelers' cheques, letters of credit and bills of exchange expressed or drawn in Indian currency and payable in foreign currency;
iii. Any instrument giving anyone the option of making it payable either partly or fully in a foreign currency.

Here, the term currency in 'foreign currency' includes coins, bank notes, postal notes, postal orders, and money orders.

18.16.1 The Structure of the Forex Market

The main players in the foreign exchange market are large commercial banks, forex brokers, large corporations, and the central banks. Central banks normally enter the market to smoothen out fluctuations in the exchange rate (as under dirty float) or to maintain fixed exchange rates.

- Large commercial banks deal in the market both to execute their clients' (both corporates and individuals) orders and on their own account. They act as market makers in the forex markets, i.e., they stand ready to buy or sell various currencies at specific prices at all points of time.
- The foreign exchange brokers do not actually buy or sell any currency. They do the work of bringing buyers and sellers together.
- Larger corporations operate in the market on their own and for their own. They generally deal in the market to satisfy their needs arising out of their normal business operations.
- The market in which the commercial banks deal with their customers (both individuals and corporates) is called the retail market, while that in which the banks deal with each other is called the wholesale or the interbank market. The size of the deals in the retail market is much smaller than that in the interbank market.
- The world-wide forex market is a 24-hour market, i.e., it is open virtually all of the 24-hours of a day, in at least one of the financial markets of the world.
- A few services in these markets report the quotes given by various players on an online basis. Reuters, and forexlive.com are a few of such services. Some

of these services now offer even screen-based trading, i.e., the quotes are automatically matched by the system and the order will be executed.

- The world over, about 85% of forex trading arises as a result of transactions between market makers and speculative transactions, with only 15% of the transactions being trade or commerce related. This results in the expectations and the actions of these two groups having an overwhelming impact on the values of various currencies, at least in the short-term. On the other hand, the presence of the activities of these two groups is essential for liquidity in the market. Competition between various market makers also ensures that the divergence in the market makers' quotes is not too large. Speculation in the forex markets is essentially a zero-sum game if it is considered as an activity only among speculators.
- In India, all dealings in foreign exchange are regulated by the Foreign Exchange Management Act, 1999 (FEMA). Reserve Bank of India is the regulatory authority for the Act.
- Here the foreign exchange market consists of three tiers. The first tier consists of all the transactions between the authorized dealers and the RBI. The authorized dealers are mostly banks. The second tier is the interbank market referred to earlier. The third tier is the retail segment, where authorized dealers and money changers deal with their customers.

18.16.2 Exchange Rate Quotations

All international trade transactions are settled in a commonly accepted currency. Fixing the exchange rate at which the domestic currency can be converted into the accepted currency requires an understanding of the various types of exchange rate quotations. An exchange rate quotation is the price of a currency stated in terms of another. It is similar to the expression of the price of a commodity. Yet, there is a peculiarity attached to exchange rate quotes. In case of a commodity, there is only one way to express its price – as number of units of money needed to buy one unit of the commodity. For example, it is always ₹ 10 per kg. of potatoes, never 100 gm. of potatoes per rupee. In case of an exchange rate quotation, both the items involved are a form of money, i.e., both are currencies. So, the price of any one of them can be quoted in terms of one unit of the other. Due to this, there exist a number of ways to express the exchange rate between a pair of currencies. It can be noticed that various reporting agencies use various methods of expressing exchange rates. In this chapter (unless otherwise specified), exchange rates will be mentioned in terms of A/B, where currency B is being bought or sold, with its value being expressed in terms of currency A. In such a quote, currency B is referred to as the base currency.

Various kinds of quotes are:

American vs. European Quote

A quote can be classified as European or American only if one of the currencies is the dollar. An American quote is the number of dollars expressed per unit of any other currency, while a European quote is the number of units of any other currency expressed per dollar. For example, ₹ 65.41/USD is a European quote, while USD 0.800496/£ is an American quote. In almost all the countries, most of the exchange rates are expressed as European quotes. The British pound, the Irish pound, and the South African rand are a few examples of currencies expressed in American quotes.

Interbank Quote vs. Merchant Quote

Merchant quote is the quote a bank gives to its retail customers. On the other hand, a quote one bank gives to another (or to any other customer in the interbank market) is called an interbank quote.

Inverse Quotes

For every quote (A/B) between two currencies, there exists an inverse quote (B/A), where currency A is being bought and sold, with its price expressed in terms of currency B. For example, for a Euro/USD quote, there exists a USD/Euro quote. The implied inverse quote can be calculated from a given quote in a very simple way.

Cross Rates

In the foreign exchange markets, it is a practice to quote most of the currencies against the dollar and to calculate the exchange rates between other currencies with the dollar as the intermediate currency. For example, the Euro/£ rate will be calculated through the Euro/USD quote and the USD/£ quote. The Euro/£ rate thus calculated is called a cross rate or the synthetic rate. Though generally the third currency used is the dollar, the cross rate between two currencies can be calculated using any other currency as the intermediate currency.

Quotes for Various Kinds of Merchant Transactions

There are different kinds of purchase and sale transactions in the retail market. The simplest is the outward or inward remittance. In this kind of transaction, the bank has to simply receive or send a currency through Telegraphic Transfer (TT), demand draft, postal order or Mail Transfer (MT). Since the work involved in such transactions is the least, a bank offers better rates for them. These rates are called the TT buying and TT selling rates. The TT selling rate is applied for outward remittances in foreign currency (not being proceeds of import bills), and for the cancellation of an earlier booked forward purchase contract. Similarly, the TT buying rate is applied to inward remittances, and for cancellation of a forward sale contract.

In India, TT buying and selling rates have to be determined in accordance with Foreign Exchange Dealers' Association of India (FEDAI) rules. These rates are

to be based on the base rate which may be derived from the ongoing market rate. This base rate is marked up to cover the dealer's margin (profit). The maximum permissible margin was earlier prescribed by FEDAI. Now it is left to the discretion of the Authorised Dealers (ADs). Bank managements generally specify the guidelines to their ADs in this regard. The ADs are also restricted from loading too high a margin by the competition that exists in this field.

18.16 Market Mechanism and Conventions

Forex market functions on the basis of the exchange rates arrived at between the buyer and seller. These exchange rates may be fixed using the exchange rate quotations outlined above. However, there are several conventions or practices also followed while fixing the exchange rates and entering into forex dealings. A dealer in forex transactions is required to understand such practices that are led by market conventions. To know more about such conventions, let us look at the following example.

Let us now see how deals are struck in the interbank market. Suppose a bank requires £1,000,000. The dealer of the bank approaches another bank and asks for a quote in the sterling, without mentioning whether he wants to buy or sell. The market-making bank gives him a two-way quote (i.e., both the bid and ask rates for sterling). If the ask rate for the pound is acceptable to the banker, he says – "One mine" – implying that he has bought £1,000,000. The trade will enter the books of both the banks and written confirmations of the trade would be sent later. The trade will be settled through any of the available electronic money transfer systems (like CHIPS). Suppose the bank wanted to sell pounds and found the quoting bank's bid rate acceptable, it would instead have said – "One yours" – implying that it has sold £1,000,000 to the market making bank.

While giving a two-way quote, a bank keeps the bid and ask rates at such levels which both buyers and sellers of the relevant currency are likely to find attractive and hence the bank expects to receive both buy and sell orders from the market. If the bank is getting orders for only one side of the transaction, it would mean either of two things – either the rates quoted by the bank are out of alignment with the rates being quoted by other players in the market, or there is too much buying or selling pressure in the market for that particular currency. In either of the cases, the bank would have to adjust its quote. Let us take the scenario where the bank is ending up getting only buy-orders for a particular currency (i.e., the bank is only buying the currency), without being able to sell. It would mean that the market is getting a competitive rate for selling the currency to the bank, but the bank's selling rate is too high to attract buyers. On the other hand, it could also mean that there are too many sellers in the market. In both the cases, the bank will have to reduce its rates on both the buy and sell side. The lower bid rate will attract a fewer number of sellers, while the lower ask rate would encourage customers to buy from the bank. In case the bank is getting too many orders to

sell currency to customers, it would have to increase both the bid and the ask rates, in order to attract more customers interested in selling the currency, and fewer interested in buying it.

18.17.1 Types of Transactions

Foreign exchange transactions can be classified on the basis of the time between entering into a transaction and its settlement. They can basically be classified into the following types:

i. **Outright** – **cash/ready** – Exchange of currencies takes place on the date of deal.

ii. **TOM (Tomorrow)** – Exchange of currencies takes place on the next working day.

iii. **Spot** – Transactions are those which are settled after two business days from the date of the contract.

iv. **Forward** – A contract (also called an outright forward) is one where the parties to the transaction agree to buy or sell a commodity (here, a currency) at a predetermined future date at a particular price. This future date may be any date beyond two business days. The price and the terms of delivery and payment are fixed at the time of entering into the contract. In the forex markets, forward contracts generally mature after 1, 2, 3, 6, 9, or 12 months. A forward contract is normally entered to hedge oneself against exchange risk (i.e., the uncertainty regarding the future movements of the exchange rate). By entering into a forward contract, the customer locks-in the exchange rate at which he will buy or sell the currency.

v. **Swap** – Simultaneous sale and purchase of identical amounts of currency for different maturities.

Example: RBI Eyes Transparency in Forex Deals

The Reserve Bank of India (RBI) wanted banks to disclose the money made on foreign exchange deals to clients as this would prevent banks from taking customers for a ride and enable businesses to look at better exchange rates when they enter into forward contracts with banks, or buy or sell foreign currency in the spot market.

RBI was of the view that most customers (small and mid-sized companies) cannot readily figure out the rate at which a bank buys or sells dollars in the inter-bank market or when it does a back-to-back sell or buy transaction with it. If the banks revealed the information on their inter-bank deal, there would be greater competition among banks and spreads across the industry would come down. This would help the exporters and importers would be in a position to negotiate finer rates for themselves when they deal with banks.

Foreign exchange market transactions between the authorized dealers and the RBI, between the banks (interbank market) and the Dealers and customers (retail segment).

Source: https://economictimes.indiatimes.com/markets/forex/rbi-eyes-transparency-in-forex-deals/articleshow/84771751.cms dated 27th July, 2021. Accessed on 17th July, 2022.

18.17.2 Settlement Dates

The settlement date of a forex transaction, also called its value date, is the day on which the transaction is settled by a transfer of deposits as explained in an earlier section. The settlement date for a spot transaction is generally the second business day from the date of the transaction, except for transactions between the US dollar and the Canadian dollar, and those between the US dollar and the Mexican peso. In both the cases, the settlement takes place the next business day. This gap between the transaction date and the settlement date is needed in order to enable the banks to confirm and clear the deals through the communication networks.

The term business day implies that neither of the days between the transaction date and the settlement date (including the settlement date) should be a holiday; either in any of the settlement locations, or in the dealing location of the market-making bank (i.e., the bank which gave the quote). The settlement locations are the countries whose currencies are involved in the transaction and the dealing locations are the countries in which the banks involved in the transaction are located. In case any of the following two days is a holiday in either of these locations, the settlement date is shifted to the next business day.

18.18 The Regulations – Indian Scenario

Indian Forex market is regulated by the Foreign Exchange Management Act, 1999 and the FEDAI (Foreign Exchange Dealer Association of India) guidelines. A business dealing in foreign exchange should function within these regulations. Some of the major regulations are discussed below.

- Prior to 1992, the Indian Forex markets were totally regulated. The value of the Indian rupee was fixed, first in terms of the pound and later the US dollar. This value was revised once in a while when the regulator felt the need. All inward and outward remittances were required to be converted at this rate of exchange.
- The liberalization of the forex markets started in 1992. In March 1992, a dual exchange rate system was put into place. This was known as Liberalized Exchange Rate Management System (LERMS). Two exchange rates were prevailing during this period, one determined by the RBI and the other determined by the market. This was the beginning of moving towards a market oriented rate. Under this system, 40% of current account receipts were required to be converted at official rate, and the balance could be converted at market determined rates.
- This was later modified to become the Unified Exchange Rate System which came into effect from March 1, 1993. Under this system, all forex transactions are required to be routed through the ADs at market determined rates. The RBI also announces its rates (which act as reference rates) based on market rates. As mentioned earlier, only permitted persons can deal in foreign

exchange (ADs etc.). Hence, any other person desirous to buy or sell foreign exchange can do so only through these permitted persons, and only for permissible transactions.

- In August 1994, the RBI announced relaxations on current account transactions and delegated further powers to ADs. They can now allow remittances for various purposes like travel, studies, medical treatment, gifts, and services, to the extent specified by the RBI under the various provisions of the Exchange Control Manual. From time to time, the RBI comes out with rules regarding the various players who are allowed to operate in the forex market, the various permissible instruments (like forward contracts, swaps etc.,), the conditions in which these instruments can be used etc. It thus regulates the operations of the market.

18.18.1 Forward Exchange Contracts

FEDAI is an association of the Authorised Dealers in foreign exchange and is registered as a company under Companies Act, 2013. FEDAI has subscribed to the Uniform Customs and Practices for Documentary Credits (UCPDC) rules. FEDAI issues guidelines from time to time with regard to foreign exchange transactions. Some such guidelines issued with respect to forward exchange contracts are as follows:

1. **Contract Amount:** Exchange contracts will be for a definite amount and for a definite period.
2. **Option period of delivery:** Unless the date of delivery is fixed and indicated in the contract, the option period may be specified at the discretion of the customer subject to the condition that such option period shall not extend beyond one month. If the fixed date of delivery or the last date of the delivery option is a known holiday then the last date shall be the preceding working day. However, in case of sudden holidays, the last date will be the succeeding working day.
3. **Place of delivery:** All contracts shall be understood to read “to be delivered or paid for at the Bank” and “at the named place”.
4. **Date of delivery:** In case of forward exchange contracts, the date of delivery will be:
    a. In case of bills/documents negotiated, purchased or discounted - the date of negotiation/purchase/ discount and payment of Rupees to the customer.
    b. In case of export bills/documents sent for collection - Date of payment of rupees to the customer on realization of the bills.
    c. In case of retirement/crystallization of import bills/documents - the date of retirement/ crystallization of liability, whichever is earlier.

5. **Option of delivery:** In all forward merchant contracts, the merchant, whether a buyer or a seller will have the option of delivery.
6. **Option of usance:** The merchant purchase contract should state the tenor of the

   bills/documents. Acceptance of delivery of bills/documents drawn for a different tenor will be at the discretion of the bank.
7. **Merchant quotations:** The exchange rate shall be quoted in direct terms i.e. so many Rupees and Paise for 1 unit or 100 units of foreign currency.
8. **Rounding off:** Rupee equivalent of the foreign currency Settlement of all merchant transactions shall be effected on the principle of rounding off the Rupee amounts to the nearest whole Rupee i.e. without paise.

Example: RBI's Forex Intervention Leans Heavily on Forwards

RBI's forex intervention was leaning heavily towards forward contracts when $ became strong to ₹. As the rupee was facing onslaught, the central bank had taken steps to sell/buy swap with banks wherein it sold $ and simultaneously agreed to buy them back at a future date through a forward contract. This step was taken by the RBI to roll over forward contracts maturing immediately by elongating their tenure and the central bank may need to continue with its sell/buy swaps to smoothen out the effect of its forward contracts on the exchange rate. It may be noted that the central bank was selling dollars continuously since May to slow down the ₹ depreciation.

Forward contract is a contract wherein the parties to the transaction agree to buy or sell a commodity/ currency at a predetermined future date at a particular price.

Source: https://www.moneycontrol.com/news/business/markets/chart-of-the-day-rbis-forex-intervention-leans-heavily-on-forwards-8698751.html dated 17th June, 2022. Accessed on 17th July, 2022.

18.18.2 Other Regulations

1. **Early Delivery:** At the request of a customer, unless stated to the contrary in the provisions of FEMA, 1999, it is optional for a bank to: (a). Accept or give early delivery; or (b). Extend the contract. It is the responsibility of a customer to effect delivery or request the bank for extension / cancellation as the case may be, on or before the maturity date of the contract. If a bank accepts or gives early delivery, the bank shall recover/pay swap difference, if any.
2. **Extension:** Foreign exchange contracts where extension is sought by the customers shall be cancelled (at an appropriate selling or buying rate as on the date of cancellation) and rebooked simultaneously only at the current rate of exchange. The difference between the contracted rate, and the rate at which the contract is cancelled, shall be recovered from/paid to the customer at the time of extension. Such request for extension shall be made on or before the maturity date of the contract.

3. Cancellation

(i) In case of cancellation of a contract at the request of a customer, (the request shall be made on or before the maturity date) the Authorised Dealer shall recover/ pay, as the case may be, the difference between the contracted rate and the rate at which the cancellation is effected. The recovery/payment of exchange difference on cancellation of forward contracts before the maturity date may be either upfront or back-ended at the discretion of banks.

(ii) Rate at which cancellation is to be effected:

(a) Purchase contracts shall be cancelled at T.T. selling rate of the contracting Authorised Dealer

(b) Sale contracts shall be cancelled at T.T. buying rate of the contracting Authorised Dealer

(c) Where the contract is cancelled before maturity, the appropriate forward T.T. rate shall be applied.

(iii) Notwithstanding the fact that the exchange contract between the customer and the bank becomes impossible of performance, for whatever reason, including Government prohibitory orders, the exchange contract shall not be deemed to have become void and the customer shall forthwith apply to the Authorised Dealer for cancellation, as per the provisions of paragraph 3(i) and (ii) above.

(iv) In the absence of any instructions from the customer, a contract which has matured shall be cancelled by the bank on the 7th working day after the maturity date. Swap cost, if any, shall be recovered from the customer under advice to him.

(v) When a contract is cancelled after the maturity date, the customer shall not be entitled to the exchange difference, if any, in his favour, since the contract is cancelled on account of his default. He shall, however, be liable to pay the exchange difference against him.

4. Swap Cost/Gain

(i) In all cases of early delivery of a contract, swap cost shall be recovered from the customer, irrespective of whether an actual swap is made or not. Such recoveries should be made either back-ended or upfront at discretion of the bank.

(ii) Payment of swap gain to a customer shall be made at the end of the swap period.

5. Outlay and Inflow of funds: Authorised Dealer shall recover interest on outlay of funds for the purpose of arranging the swap, in addition to the swap cost in case of early delivery of a contract. If such a swap leads to inflow of

funds, interest shall be paid to the customer. Funds outlay / inflow shall be arrived at by taking the difference between the original contract rate and the rate at which the swap could be arranged. The rate of interest to be recovered / paid should be determined by banks as per their policy in this regard.

18.19 Exchange Rate Determination

Generally, the exchange rate of currency is affected by a number of factors. Out of these the most important factors are price levels and interest rates across different countries. Understanding the factors gives opportunity to foreign exchange dealers to engage in arbitraging and to international traders in choosing the currencies which have most attractive rates. In the following sections we will explain how price levels and interest rates affect/determine the exchange rates.

Example: India, Russia Apex Banks to Work on Payment System

Foreign Exchange Dealers Association of India (FEDAI), National Payments Corporation of India (NPCI) along with the general managers of SBI, UCO Bank, Bank of Maharashtra, Canara Bank, IndusInd Bank will likely represent Indian bankers along with the executives of SberBank and VEB Bank Russia of Russia. The officials of the Reserve Bank of India (RBI) and the Bank of Russia were meeting to give the finishing touches to a bilateral payment system to ensure smooth trade flows between the two nations. The officials of the financial ministries will also participate in the discussion. The two sides will meet to discuss payment solutions such as Loro or Nostro accounts and will also examine how these accounts can be opened in the national currencies of India and Russia. The new Rupee-Rouble trade payment mechanism can allow Indian exporters to be paid in Indian rupees for their exports to Russia instead of the standard $.

Source: https://economictimes.indiatimes.com/news/economy/finance/india-russia-apex-banks-to-work-on-payment-system-this-week/articleshow/92215361.cms dated 15th June, 2022. Accessed on 17th July, 2022.

18.19.1 Purchasing Power Parity Principle

The Purchasing Power Parity Principle (PPP) was propounded by a Swedish economist, Gustav Cassel in 1918. According to this theory, the price levels and the changes in price levels in different countries determine the exchange rates of the currencies these countries. The basic tenet of this principle is that the exchange rates between various currencies reflect the purchasing power of these currencies. This tenet is based on the Law of One Price.

The Law of One Price

The assumptions of Law of One Price are: (i) there is no restriction on the movement of goods between countries, (ii) there are no transportation costs involved, (iii) there are no transaction costs involved in the buying and selling of goods, and (iv) there are no tariffs.

According to the Law of One Price, in equilibrium conditions, the price of a commodity has to be the same across the world. If it were not true, arbitrageurs would drive the price towards equality by buying in the cheaper market and selling in the dearer one, i.e., by two-way arbitrage. For example, if the cost of steel in Germany (in dollar terms) was USD300/tonne and in the US it was USD350/tonne, arbitrageurs would start buying steel in Germany to sell it in the US. This would increase the steel prices in Germany and reduce the US prices. This process will continue till steel becomes equally priced in both the countries.

According to this law, the domestic currency price of a commodity in various countries, when converted into a common currency at the ruling spot exchange rate, is the same throughout the world. So, the price of a commodity in country A can be easily calculated by converting its price in country B's currency, at the ruling spot exchange rate between the currencies of the two countries. To continue our example

$$p_{Britain} = S(£/\$) \times p_{US}$$

Where,

$p_{Britain}$ is the price of steel in Germany,

S(£/$) is the spot exchange rate between mark and dollar, and

p_{US} is the price of steel in the US.

This equation can be generalized as:

$$p_A^x = S(A/B) \text{ x } p_B^x$$

Where,

p_A^x is the price of commodity 'x' in country A.

S(A/B) is the spot exchange rate of the two countries' currency.

and p_B^x is the price of commodity 'x' in country B.

There are three forms of PPP which emerge from the Law of One Price – the absolute form, the relative form and the expectations form.

The Absolute Form of PPP

If the Law of One Price were to hold good for each and every commodity, then it will follow that:

$P_A = S(A/B) \text{ x } P_B$

Where,

P_A and P_B are the prices of the same basket of goods and services in countries A and B respectively.

The above eequation can be rewritten as:

$$S(A/B) = \frac{P_A}{P_B}$$

According to this equation, the exchange rate between two countries' currencies is determined by the respective price levels in the two countries.

Example: Absolute Form of PPP (APPP)

Assumption - India and Argentina has PPP

As on 15th July, 2022, the exchange rate of INR to Argentina pesos = ₹ 1/ AR pesos 1.603

The price of a Big Mac (Big Spicy Chicken Wrap) in India is ₹ 194.

As per APPP, $S(I/A) = P_I / P_A$ where S(I /A) = The spot exchange rate of the two countries' currency, India and Argentina, and P_I/P_A price of the goods in India and Argentina.

Based on the APPP between the two countries, $(1 / 1.603) = 194/ P_A$ or P_A

$= 194 \times 1.603 = 310.98$

The price of a Big Mac (Big Spicy Chicken Wrap) in Mexico should be 310.98.

The exchange rate between two countries' currencies is determined by the respective price levels in the two countries.

Source: https://fx-rate.net/INR/ARS/ Accessed on 17th July, 2022.

The Relative Form of PPP

The absolute form of PPP describes the link between the spot exchange rate and the price levels at a particular point of time. On the other hand, the relative form of PPP talks about the link between the changes in spot rates and in price levels over a period of time. According to this theory, changes in spot rates over a period of time reflect the changes in the price levels over the same period in the economies concerned.

The relative form can be derived from the absolute form in the following manner:

Let $S^{\sim}(A/B)$ denote the percentage change in spot rate (expressed in decimal terms) between currencies of countries A and B over a year, and $P_A^{\sim}$ and $P_B^{\sim}$ denote the percentage change in the price levels (expressed in decimal terms), i.e., the inflation rates in the two countries over the same period of time. If,

$$P_A = S(A/B) \times P_B$$

then, at the end of one year,

$$P_A(1 + P_A^{\sim}) = S(A/B) \{1 + S^{\sim}(A/B)\} \times P_B (1 + P_B^{\sim})$$

Here, the left-hand side of the equation represents the price level in country A after one year, the first term on the right-hand side of the equation represents the spot exchange rate between the two currencies at the end of one year, and the last term gives the price level in country B after one year. These terms are arrived at by multiplying the figures at the beginning of the year by 1, plus the percentage change in the respective figures.

Dividing equation (8) by equation (6), we get,

$$(1 + P_A^{\sim}) = \{1 + S^{\sim}(A/B)\} \text{ x } (1 + P_B^{\sim})$$

We can rewrite the equation as:

$$1 + S^{\sim}(A/B) = \frac{1+P_A^{\sim}}{1+P_B^{\sim}}$$

$$\rightarrow S^{\sim}(A/B) = \frac{1+P_A^{\sim}}{1+P_B^{\sim}} - 1$$

$$\rightarrow S^{\sim}(A/B) = \frac{P_A^{\sim} - P_B^{\sim}}{1+P_B^{\sim}}.$$

The Expectations Form of PPP

According to this form of PPP, the expected percentage change in the spot rate is equal to the difference in the expected inflation rates in the two countries. Let the expected percentage change in the spot rate be denoted by $S^*(A/B)$, the expected inflation rate in country A by P_A^*, and the expected inflation rate in country B by P_B^*. If a person buys the underlying basket of commodities in country A and holds it for one year, he can expect to earn a return equal to the expected inflation rate in country A, i.e., P_A^*. On the other hand, if he decides to buy the same basket of commodities in country B, holds it for one year, and then converts his returns in currency B into currency A at the spot rate that is expected to rule at that time {i.e., S*(A/B)}, his expected returns will be equal to the expected inflation rate in country B, i.e., P_B^*, plus the expected change in the spot rate. If the speculators are risk-neutral, as this theory assumes, then these two returns should be equal, i.e.,

$$P_A^* = P_B^* + S^*(A/B)$$

$$\rightarrow S^*(A/B) = P_A^* - P_B^*.$$

Empirical Evidence Regarding PPP

A multitude of studies have been conducted over a number of years to verify whether the Law of One Price and the various forms of PPP actually hold good. These studies were conducted using various sets of data and various methods of testing. According to the findings of a study conducted by J David Richardson, the Law of One Price does not seem to hold good in the short-term, especially for goods having an inelastic demand (as these are the goods for which differential prices can be charged in different countries without the demand getting affected). In case of other goods, it does hold good, though only in the long-term.

As for the relative PPP, the results of the various studies have been quite conflicting. Irving B Kravis and Richard E. Lipsey conducted a study and arrived at the conclusion that PPP does not hold precisely. They found that there were

substantial departures over long periods even for traded goods, while for non-traded goods PPP does not seem to hold even over short periods.

Though highly conflicting results have been obtained by different studies, those based on the generally available data largely indicate that PPP does not hold good, i.e., the movements in exchange rates are not explained by movements in price levels, and vice versa. A major reason for this happening is that there are a number of other factors which also affect the movements in exchange rates, especially in the short-term, which may dominate the effect of inflation. This limits the effect of price movements on the exchange rates. There are three other major reasons for the PPP not holding good:

i. Constraints on movement of commodities,

ii. Price index construction, and

iii. Effect of the statistical method employed.

18.19.2 Interest Rate Parity

The PPP gives the equilibrium conditions in the commodity market. Its equivalent in the financial markets is a theory called the Interest Rate Parity (IRP) or the covered interest parity condition. According to this theory, the cost of money (i.e., the cost of borrowing money or the rate of return on financial investments), when adjusted for the cost of covering foreign exchange risk, is equal across different currencies. This is so, because in the absence of any transaction costs, taxes, and capital controls (i.e., restrictions on international investments and financing), investors and borrowers will tend to transact in those currencies which provide them the most attractive prices. Besides, the arbitrageurs will always be on the lookout for an opportunity to make riskless profits. The resultant effects on the demand and supply would drive the value of currencies towards equalization.

Just like the price of commodities across different countries influences the decision of buyers and sellers, decision as to where they should transact, the ruling interest rate on financial assets denominated in different currencies affects the decision of investors and borrowers, regarding the market they would like to transact in.

Decision of Investors

Any individual or corporate is unlikely to have fully-matched income and expenditures in each and every period. While there are periods where the current expenditure is more than the current income giving rise to a requirement to borrow, there are also periods where the opposite holds true giving rise to a chance to invest. These periods of surplus or shortfall may range from a few days to a few years. Suppose, a corporate has surplus funds for a period of one year. It could either invest them in securities denominated in the domestic currency, or in

securities denominated in any other currency. The returns it will earn if it invests in securities denominated in a foreign currency will depend on two factors – the interest rate on those securities, and the change in the value of the relevant currency. Suppose, the currency in which the company's investments are denominated depreciates during the period of the investment. In that case, the gain by way of interest earned will stand eroded by the loss on conversion to the domestic currency. With the exchange rates being flexible, there is always the risk of exchange rates moving unfavorably. Since an investment in securities denominated in the domestic currency does not face any exchange risk, the same risk will have to be removed from other investments as well, in order to make their returns comparable. The investor can do this by entering into a forward contract for the relevant maturity. By taking the forward rate into consideration, the investor will be able to know the total returns that can be earned on securities denominated in different currencies, which will enable him to invest where his returns are maximized.

Decision of the Borrowers

When the need to borrow money arises, the borrower has the option to borrow in the domestic currency, or in foreign currency. Again, his decision will be based on the cost of domestic currency borrowing as compared to the covered cost of foreign borrowing.

Reasons for Departure from Interest Rate Parity

While introducing the topic of interest rate parity, it was mentioned that this theory holds good in the absence of a few factors like taxes, capital control, and transaction costs. In reality, the presence of these factors allows interest rates and forward premiums to deviate from the covered IRP. Covered IRP does not hold good perfectly because of the presence of factors such as transaction costs, political risks, taxes, liquidity preference and capital controls

18.20 Foreign Exchange Exposure & Foreign Exchange Risk

The corporates whether operating domestically or internationally, are exposed to risks arising due to unexpected movements in exchange rates. Such risks may result in adverse impact on profits. Hence, it is imperative to have knowledge of these risks.

Foreign exchange exposure results in foreign exchange risk due to the volatile movement of exchange rates. Variability of exchange rates gives rise to foreign exchange exposure and foreign exchange risk. Though these two terms are often used interchangeably, in reality they represent two different, yet closely related, concepts. Let us first understand these two terms.

Example: Foreign Exposure Risk faced by Indian Companies

As the Indian currency 'Rupee' was weakening against $ and its lowest versus the US greenback, several smaller and mid-sized companies were expected to face rough weather as almost 44 per cent of the foreign loans taken by Indian companies remained unhedged and face exposure risk.

The variance of the domestic-currency value of an asset, liability, or operating income due to unanticipated changes in exchange rates.

Source: https://www.business-standard.com/article/markets/weak-rupee-a-worry-for-indian-firms-as-44-foreign-loans-unhedged-122070601116_1.html dated 6th July, 2022. Accessed on 17th July, 2022.

18.20.1 Foreign Exchange Exposure

Adler and Dumas define foreign exchange exposure as 'the sensitivity of changes in the real domestic currency value of assets and liabilities, or operating incomes to unanticipated changes in exchange rates'. It means that exposure is the amount of assets, liabilities, and operating income that is at risk from unexpected changes in exchange rates. The way it has been defined by Adler and Dumas helps in measuring exposure. The sensitivity can be measured by the slope of the regression equation between two variables called the unexpected changes in the exchange rates and the resultant change in the domestic-currency value of assets, liabilities, and operating incomes. The second variable can be divided into four categories for the purpose of measurement of exposure. These are:

- Foreign currency assets and liabilities, which have fixed foreign-currency values.
- Foreign currency assets and liabilities with foreign-currency values that change with an unexpected change in the exchange rate.
- Domestic currency assets and liabilities.
- Operating incomes.

18.20.2 Definition: Foreign Exchange Risk

Maurice D. Levi describes foreign exchange risk as "the variance of the domestic-currency value of an asset, liability, or operating income that is attributable to unanticipated changes in exchange rates."

According to this definition, foreign-exchange risk results when the domestic-currency value of assets, liabilities or operating incomes, become variables in response to unexpected changes in exchange rates. Hence, for exchange rate risk to be present, the presence of two factors are essential. One is the variability of exchange rates, and the second is exposure. If an asset, liability or operating income is not exposed to exchange rate changes, variability of exchange rate does not create any exchange rate risk. Similarly, variability of domestic-currency value of an asset, liability or operating income which is not linked to exchange

rate movements, or where the changes in exchange rates are perfectly predictable, does not create any exchange rate risk. The exchange rate risk can be expressed as a function of exposure and variance of exchange rate. This can be presented as:

$$\text{var}\ (\Delta V) = \text{var}\ [a \times \Delta S^u]\ \text{or,}\ \text{var}\ (\Delta V) = a^2 \times \text{var}\ \left(\Delta S^u\right)$$

Where,

$\text{var}\ (\Delta V)$ = Exchange rate risk,

a = The slope of the regression line, and

ΔS^u = Unexpected change in the exchange rate.

This is in conformity to our statement that exchange rate risk is dependent on both exposure and unexpected changes in exchange rates.

Check Your Progress - 2

6. International monetary fund came into existence during which of the following monetary systems?
   a. European Monetary System.
   b. Bretton Woods system.
   c. Gold Standard.
   d. Gold-Exchange Standard
   e. Post Bretton Woods System
7. Which of the following does not represent a reason for Interest Rate Parity theory not holding good perfectly?
   a. Transaction costs
   b. Political stability
   c. Taxes
   d. Liquidity preference
   e. Capital controls
8. Which of the following is an example to Target Zone Arrangement?
   a. Gold-Exchange Standard
   b. Bretton Woods System
   c. European Monetary System
   d. Gold Standard
   e. Post-Bretton Woods System
9. What is the reduction in the price of a currency in terms of another currency termed as?
   a. Appreciation in the exchange rate
   b. Devaluation of currency

c. Depreciation in the exchange rate
d. Appreciation in the currency
e. Revaluation of currency.

10. Which of the following is not an assumption of Law of One Price?
    a. there is no restriction on the movement of goods between countries
    b. there are no transportation costs involved
    c. there are no transaction costs involved in the buying and selling of goods
    d. there are tariffs
    e. there are no tariffs

18.21 Types of Exposure

Exposure to foreign exchange risk may prove detrimental as it impacts the profits of the business. Hence, a business exposed to such risk should be aware of the type of exposure that is leading to the risk so that it can take measures to control such exposures. Foreign exchange exposure can be classified into three kinds on the basis of the nature of item, measurability, and the timing of estimation of exposure. They are:

- Transaction exposure
- Translation exposure
- Operating exposure

18.21.1 Transaction Exposure

Transaction exposure is the exposure that arises from foreign currency denominated transactions which an entity is committed to complete. For example, if a firm has entered into a contract to sell computers to a foreign customer at a fixed price denominated in a foreign currency, the firm would be exposed to exchange rate movements till it receives the payment and converts the receipts into the domestic currency.

18.21.2 Translation Exposure

Translation exposure is the exposure that arises from the need to convert values of assets and liabilities denominated in a foreign currency, into the domestic currency. For example, a company having a foreign currency deposit would need to translate its value into its domestic currency for the purpose of reporting at the time of preparation of its financial statements. Any exposure arising out of exchange rate movement and the resultant change in the domestic-currency value of the deposit, would classify as translation exposure. It needs to be noted that this exposure is mostly notional, as there is no real gain or loss due to exchange rate movements since the asset or liability does not stand liquidated at the time of reporting. Hence, it is also referred to as accounting exposure.

18.21.3 Operating Exposure

Operating exposure is defined by Alan Shapiro as "the extent to which the value of a firm stands exposed to exchange rate movements, the firm's value being measured by the present value of its expected cash flows". Operating exposure is a result of economic consequences (rather than accounting consequences, as in the case of transaction and translation exposure) of exchange rate movements on the value of a firm, and hence, is also known as economic exposure. This operating exposure describes the risk of future cash flows of a firm changing due to a change in the exchange rate.

Example: Transaction Loss

Omega Industries negotiated an order on Johnson Equipment's Inc, Atlanta US to purchase 10 advanced pieces of drilling tools.

The price per tool was $ 1,200 and the total value of the import = $ 12,000.

The exchange rate between the $ and ₹ at the time of negotiating the contract was 1/78.

15 days later, when Omega placed the order and committed to purchasing the 10 pieces of machinery, the exchange rate between the $ and ₹ changed to 1/79.

Omega Industries incurred a forex exposure / transaction loss of ₹ / $ which works out to ₹ 12,000.

Exposure that arises from foreign currency denominated transactions which an entity is committed to complete.

18.22 Management of Exchange Risk

In the previous sub-topic we have learnt that there are three types of exposure to exchange risk. Management of exchange risk thus involves management of these three types of exposures to eliminate the exchange risk arising out of these exposures.

18.22.1 Management of Transaction and Translation Exposure

As transaction exposure arises out of the day-to-day activities of a firm, managing this exposure is also, essentially, a day-to-day operation the treasurer carries out. It involves continuous monitoring of exchange rates and the firm's exposure, along with an evaluation of the effectiveness of the hedging techniques employed. On the other hand, management of translation exposure is a periodic affair, coming into the picture at the time of preparation of financial statements, because it is an accounting exposure. This makes the management of translation exposure more of a policy decision, rather than a day-to-day issue to be handled by the treasurer.

Management of exposure essentially means reduction or elimination of exchange rate risk through hedging. It involves taking a position in the forex/and or the

money market which cancels out the outstanding position. Though the frequency at which the need to manage transaction and translation exposure arises differs, the basic instruments that can be used are the same. These instruments can be broadly classified as internal and external instruments.

Various Internal Hedging Techniques

Internal hedging instruments are those which are a part of the day-to-day operations of a company. It needs to be noted that the term internal does not denote that no external party is involved; it only denotes that it is a normal activity for the company. The various internal hedging techniques are:

Hedging by Exposure Netting

Exposure netting involves creating exposures in the normal course of business which offsets the existing exposures. The exposures so created may be in the same currency as the existing exposures, or in any other currency, but the effect should be that any movement in exchange rates that results in a loss on the original exposure should result in a gain on the new exposure. This may be achieved by creating an opposite exposure in the same currency or a different currency which moves in tandem with the currency of the original exposure. It may also be achieved by creating a similar exposure in a currency which moves in the opposite direction to the currency of the original exposure.

Hedging by Leading and Lagging

Leading and lagging can also be used to hedge exposures. Leading involves advancing a payment, i.e., making a payment before it is due. Lagging, on the other hand, refers to postponing a payment. A company can lead payments required to be made in a currency that is likely to appreciate, and lag the payments that it needs to make in a currency that is likely to depreciate.

Hedging by Choosing the Currency of Invoicing

One very simple way of eliminating transaction and translation exposure is to invoice all receivables and payables in the domestic currency. This hedging tool can be applied by the outlook of a firm about various currencies. This involves invoicing exports in a hard currency and imports in a soft currency. The currency so chosen may not be the domestic currency for either of the parties involved, and may be selected because of its stability (like the dollar, which serves as an international currency).

Hedging through Sourcing

Sourcing is a specific way of exposure-netting. It involves a firm buying the raw materials in the same currency in which it sells its products. This results in netting of the exposure, at least to some extent.

Various External Hedging Techniques

External hedging instruments are the ones which are not a part of the day-to-day activities, and are especially undertaken for the purpose of hedging exchange rate risk. These include:

- Forwards
- Futures
- Options
- Money market operations

Forwards, Futures and Options are explained in the next chapter in detail.

Hedging through the Forward Market

In order to hedge its transaction exposure, a company having a long position in a currency (having a receivable) will sell the currency forward, i.e., go short in the forward market, and a company having a short position in a currency (having a payable) will buy the currency forward, i.e., go long in the forward market.

The cost of a forward hedge can be measured by the opportunity cost, which depends on the expected spot rate at which the currency needs to be bought or sold in the absence of the forward contract. Hence, the cost of a forward hedge is measured as the difference between the forward rate and the expected spot rate for the relevant maturity. In an efficient market, as mentioned earlier, the forward rate is an unbiased predictor of the future spot rate. The process equating these two requires the speculators to be risk-neutral. Hence, when the markets are efficient and the speculators are risk-averse, the cost of hedging through the forward market will be nil.

Hedging through Futures

The second way to hedge exposure is through futures. The rule is the same as in the forward market, i.e., go short in futures if you are long in the currency and vice versa. Hence, if an importer needs to pay $2,50,000 after four months, he can buy dollar futures for the required sum and maturity. The main difference between hedging through forwards and through futures is that while under a forward contract the whole receipt/payment takes place at the time of maturity of the contract, in case of futures, there has to be an initial payment of margin money, and further payments/receipts during the tenure of the contract on the basis of market movements.

Hedging through Options

Options can prove to be a useful and flexible tool for hedging transaction and translation exposure. A firm having a foreign currency receivable can buy a put option on the currency, having the same maturity as the receivable. Conversely, a firm having a foreign currency payable can buy a call option on the currency with the same maturity.

Hedging through the Money Market

Money markets can also be used for hedging foreign currency receivables or payables. Let us say, a firm has a dollar payable after three months. It can borrow in the domestic currency now, convert it at the spot rate into dollars, invest those dollars in the money markets, and use the proceeds to pay the payable after three months. This process locks the exchange rate at which the firm needs to buy dollars. At the same time, it knows its total cost in advance in the form of the principal and the interest it needs to repay in the domestic markets.

Example: Exotic Forex Derivatives in India

In order to deepen the financial markets, Reserve Bank of India allowed lenders to offer derivative products and banks such as ICICI Bank Ltd. and Axis Bank Ltd. sold barrier forex options to customers including Reliance Industries Ltd. and Supreme Petrochem Ltd.

Exotic derivatives, especially the knock-in barrier options, offered an ideal mix of risk management at a reduced cost than traditional vanilla options. The payoff on these products depended on whether or not the underlying asset reached a pre-determined price.

Any of the derivatives such as options, forwards, swaps etc. can be used to manage forex risk.

Source: https://theprint.in/economy/exotic-forex-derivatives-make-comeback-in-india-as-rbi-pushes-to-deepen-markets/808041/ dated 20th January, 2022. Accessed on 17th July, 2022.

18.22.2 Management of Economic Exposure

Generally economic exposure cannot be managed by the traditional hedging techniques due to the unpredictability of the changes in the cash flows. Managing the economic exposure requires various marketing, production, and financial management strategies to cope with the risks.

Changes in real exchange rate may either bring about losses, or create an opportunity to increase the profits for an exposed firm, by changing the relative prices, and hence, the competitiveness of the firm. Depending on the duration for which the change in the exchange rate is expected to last, an appropriate strategy can be adopted.

Marketing Strategies

The marketing manager needs to analyze the effect of a change in the exchange rate, and evaluate the strategy required to manage the exposure. The four strategies available to him are:

Market Selection

This strategy is useful when the actual or anticipated change in the real exchange rate is likely to persist for a long time. It involves selection of the markets in

which the firm wishes to market its products and provide relevant services, to give the firm an edge in these markets.

Pricing Strategy

There are two main issues involved in developing a pricing strategy – the choice between market share and profits, and the frequency of price adjustments.

Market Share vs. Profit Margin: When the domestic currency appreciates, a firm can either reduce its domestic currency prices, or maintain the domestic currency prices, which would result in an increase in the foreign currency price. While the former would result in the profit margins coming down, the latter may result in a fall in the market share, which would again affect the profits of the firm. On the other hand, a firm facing a depreciation of the domestic currency may either increase the domestic currency price which would result in the profit margin going up (called price skimming), or maintain them at the pre-depreciation level, thus reducing the foreign currency price to increase its market share (called penetration pricing).

Frequency of Price Adjustments: While a firm may decide to change the price of its products with a change in the exchange rates, it would still need to decide upon the frequency of such price changes. As we know, exchange rates move even on a minute-to-minute basis. A firm's sales may get affected by frequent price changes, because of the resultant risk its consumers face. On the other hand, a firm may lose on account of unfavorable exchange rate movements, if it delays the change in the price of its product. Finally, a balance between the two, needs to be arrived at, based on the level of uncertainty the firm's customers are ready to face, the duration for which the exchange rate movement is likely to persist, and the loss expected to be incurred by not changing the prices.

Promotional Strategy

The promotional strategy deciding the amount that the firm desires to spend in various markets in promoting its products, needs to take the exchange rate movements into consideration. A change in the exchange rate would change the domestic-currency cost of overseas promotion. The effect of exchange rate movements on promotional costs is also in the form of the expected revenues that can be generated per unit of expenditure on promotion.

Product Strategy

A firm can use product strategy to respond to exchange rate movements. It may involve timing of introduction of new products, making product-line decisions, and product innovations. The best time for a company to introduce a new product would be when it has a price advantage (for example, in case of an exporting firm, when the domestic currency has depreciated). Product-line decisions refer to the company having to change its products in accordance with the exchange rate movements. The third component of this strategy is product innovations. In the

face of an appreciating domestic currency and extremely competitive conditions in the international market, the firm may be able to protect its cash flows by regularly coming up with innovative products. Thus, by offering differentiated product to its customers, the firm may be able to protect its foreign currency price, and hence, its profits.

Production Strategies

Sometimes, exchange rate movements are too large and long lasting to be handled by marketing strategies. In these situations, the production manager may need to step in, to take long-term decisions to protect the firm from harmful effects of an unfavorable exchange rate movement, or to help it take advantage of favorable movements. The following strategies would be available to the production manager:

Input Mix

The pressures on the profits of an exporting firm caused by an appreciating domestic currency can be countered by buying more inputs in the international markets than in the domestic market. This would reduce the costs at the time of reducing revenues, thus protecting the profits, at least to a certain extent.

Product Sourcing

This strategy pre-supposes the presence of production facilities in more than one country. As a response to exchange rate movements, the firm can re-allocate production to increase the quantity produced in the country whose currency has depreciated, and reducing production in countries whose currency has appreciated.

Plant Location

Companies which do not have multiple production facilities may be forced to set up such facilities abroad as a response to exchange rate movements, which change the relative cost advantages of countries. Firms may even decide to set up production facilities in third-world countries for labor-intensive products, due to the low labor cost there, without there being any specific advantage due to exchange rate movements.

Raising Productivity

An appreciation of the domestic currency results in increasing the costs of an exporting firm in terms of the foreign currency, thus making the product uncompetitive in the international market, forcing the firm either to bear a cut in the profit margin or to lose market share. This problem may be resolved with the firm making an effort to reduce the domestic currency cost of its product in the wake of a domestic currency appreciation. This may happen automatically in case imported raw materials or intermediate inputs are being used. When this is not the case the firm may have to resort to other measures like attempting to increase the productivity of the various factors of production.

Financial Management Strategies

The production and marketing strategies detailed above generally take some time to be implemented. The focus of the financial management strategies is to control the damage caused by unfavorable exchange rate movements while the above strategies are being implemented. The major financial management strategy is to create liabilities in the currency to which the firm's earnings are exposed to a large extent, thus creating a natural hedge. Any loss of operating profits caused due to exchange rate movements would then be made up at least partially by reduction of debt-servicing costs.

18.21 Summary

- World trade has grown rapidly in the last few decades. The theory of Absolute Advantage, theory of Comparative Advantage, Heckscher-Ohlin Model, Imitation-Gap theory, and International Product Life Cycle theory analyze the reasons for development of international trade. Latest developments are expected to make it grow at an even faster rate.
- Whether the benefits of this growth are being equally distributed among various nations or are being usurped by a few developed nations due to the political and economic power enjoyed by them, is a hotly debated topic which is unlikely to be settled in the near future
- The only thing which is certain is that the world as a whole is going to tremendously benefit from the attempt of several nations to sort out differences among them, and to find mutually benefiting solutions to the various problems they are facing.
- BoP account is a summary of the flow of economic transactions between the residents of a country and the Rest of the World (ROW), during a given time period. The BoP data also helps in analyzing whether a particular course of action is likely to be helpful or not in eliminating or reducing a current account deficit. At the same time, BoP data cannot be considered in isolation for predicting a movement in the exchange rates.
- Knowledge and understanding of economies of different countries and their markets is a must for establishing oneself as a global player. Studying international finance helps a Finance Manager to understand the complexities of the various economies. It can help him/her understand as to how the various events taking place in the world over, are going to affect the operations of his/her firm. It also helps him/her to identify and exploit opportunities, while protecting his/her firm from the harmful effects of international events.
- Knowledge about foreign exchange market is also essential to him to understand the different kinds of quotes involved in the Forex market and how the transaction takes place. Quotes can be categorized into various

forms, namely, American and European quote, interbank quotes, merchant quote etc.

- Nowadays, corporates, whether operating domestically or internationally, are exposed to risks of adverse movements in their profits resulting from unexpected movements in exchange rates. Unanticipated variability in exchange rates leads to foreign exchange risk, which can be managed through various strategies.

18.22 Glossary

Absolute Advantage is the capability of a country or company to produce a good or service efficiently with available resources at a lower cost per unit than the cost at which any other entity produces that same good or services.

Arbitrage is the process of buying and selling in two different markets simultaneously. Also known as risk-less profit it adopts- Buy Low, Sell High policy.

Comparative Advantage is applied by countries to determine what goods and services they specialize in producing goods or services at lesser opportunity cost.

Demand Lag is the difference between the time and new or an improved product is introduced in one country & the time when consumers in the other country start demanding it

Devaluation is the reduction in the value of a currency, dictated by the authorities.

Diversification vesting in different asset classes and in securities of many issuers in an attempt to reduce overall investment risk, and to avoid damaging a portfolio's performance by the poor performance of a single security, industry, (or country).

Economic Cost is the cost involved in the discretion of one course of action with another in combining the profits and losses of goods and services that have a value attached to it.

Embargo refers to ban or prohibition to trading activities among countries.

Euro is the new common currency for eleven European nations which came into effect from January 1, 1999.

Exchange Risk is the uncertainty of returns induced by unexpected changes in exchange rates.

Fiat Money is the money which has insignificant intrinsic value, but a high face value due to the decree or fiat that it can be used for the settlement of all the financial obligations.

Full Employment is a situation in which all available labor resources are being used in the most economically efficient way.

Imitation Lag is the difference between the time of introduction of the product in one country & time when the producers in the other country starts producing it.

Intra-Industry Trade refers to the trading activities involved in export and import of goods and services in same industry

Market Structure are the collective factors that refers to changes taking place between the buyers and sellers interaction in a market

Non-tariff Barriers are the rules, regulations and bureaucratic delays which keeps foreign goods out of the domestic markets.

Perfect Competition: The situation prevailing in a market in which buyers and sellers are so numerous and well informed that all elements of monopoly are absent, and the market price of a commodity is beyond the control of individual buyers and sellers.

Present Value: The current worth of a future sum of money or stream of cash flow; given a specified rate of return.

Price Elasticity of Demand shows the relationship between price and quantity demanded in a given time period.

Product Differentiation is the process of distinguishing a product or service from others, to make it more attractive to a particular target market.

Quota is the limit that is imposed to number of units imported or market share held by foreign producers.

Tariff is a tax levied on goods traded internationally.

Technological Innovation encompasses new products and processes that adds significant technological changes to products and processes involved.

18.23 Self-Assessment Test

1. Integration of financial markets has led to the increased competition in international trade and service. Explain the major theories propounded to analyze the reasons for development of international trade.
2. Write a brief note on trade barriers to international trade.
3. Balance of Payments (BOP), is the summary of financial transactions between countries. Enumerate on the components and factors that affect the components of BOP.
4. Discuss in detail the exchange rate mechanism of the International Monetary System.
5. Narrate on the evolution of monetary systems.
6. Describe the structure of Forex market.

7. "Forward contract is the agreement between two parties to buy or sell the underlying asset and is regulated by the apex institutions in the Indian Forex Market"- Elucidate.
8. Give a detailed note on the nature and scope of Purchasing Power Parity Principle.
9. What defines a hedging process? Describe the methods of hedging technique in managing the exchange risks.

18.24 Suggested Readings / Reference Material

1. Richard Brealey, Stewart Myers and Franklin Allen (2020). *Principles of Corporate Finance*, 13th edition, USA: Mcgraw-Hill Companies Inc.
2. Prasanna Chandra (2020). *Fundamentals of Financial Management*, 7th edition, New Delhi: Tata Mcgraw-Hill.
3. Prakash. G. Apte (2020), *International Financial Management*, 8th edition, McGraw Hill India
4. Machiraju, H.R (2019). *International Financial Management, 4th edition* Himalaya Publishing House
5. Jeff Madura (2018), *International Financial Management*, 13th revised edition, Cengage Learning
6. Madhusudhana H.S. (2019). Foreign Direct Investment (FDI) and ease of Doing Business in India. New Century Publications

18.25 Answers to Check Your Progress Questions

1. (d) Posner

The imitation gap theory, given by Posner, considers the possibility of trade between two countries having similar factor endowments and consumer tastes.

2. (a) Flexible wages

While explaining the theory of comparative advantage, David Ricardo made certain implicit assumptions as perfect competition, productivity of labor, full employment, mobility and technology. Hence, flexible wages is not an assumption.

3. (c) Export duty

Another type of tariff, less frequently imposed, is the export duty which is levied on goods being taken out of the country, to discourage the export of those goods.

4. (c) Heckscher-Ohlin model

According to Heckscher-Ohlin theory, there are two types of products – labor intensive and capital intensive. The labor-rich country is more likely to produce labor-intensive goods, and the country rich in capital will most probably produce capital-intensive goods.

5. (c) Anti-dumping duty

When some foreign producer is found to be dumping some particular good, i.e., selling it at a price that does not even cover his costs (this may be done to secure a foothold in the market), anti-dumping duty may be levied.

6. (b) Bretton Woods system

In the Bretton Woods system, two new institutions were to be established, namely, the International Monetary Fund (IMF), and the International Bank for Reconstruction and Development (IBRD), which is part of the World Bank.

7. (b) Political stability

Covered IRP does not hold good perfectly because of the following reasons: Transaction costs, Political risks, Taxes, Liquidity preference and Capital controls.

8. (c) European Monetary System

A group of countries sometimes get together and agree to maintain the exchange rates between their currencies within a certain band around fixed central exchange rates. This system is called a target zone arrangement. An example of this system is the European Monetary System under which 12 countries came together in 1979, and attempted to maintain the exchange rates of their currencies with other member countries' currencies within a fixed band, around the central exchange rate.

9. (b) Devaluation of currency

Devaluation is the reduction in the value of a currency, dictated by the authorities.

10. (d) There are tariffs

The assumptions of Law of One Price are: (i) There is no restriction on the movement of goods between countries (ii) There are no transportation costs involved (iii) There are no transaction costs involved in the buying and selling of goods, and (iv) there are no tariffs.

Unit 19

Financial Risk Management

Structure

"It's the lack of risk-taking that leads to stagnation. You can be stable and take risks."

- *Gwen Bell*

19.1 Introduction

Since time immemorial, human beings have tried to manage risks they faced in their day-to-day life. Keeping inflammable material away from fire, saving for possible future financial needs, creation of a legal will to avoid property disputes

are all examples of an attempt at managing risk. Risk is the possibility of the actual outcome being different from the expected outcome. It includes both the downside and the upside potential. Downside potential is the possibility of the actual results being adverse compared to the expected results. On the other hand, upside potential is the possibility of the actual results being better than the expected results.

A corporate's aim is to create wealth for its shareholders. This wealth is reflected in the market value of its shares. Hence, for a company the risk faced is reflected in the possibility of the actual market value of its shares being different from the expected market value. As the market value of a firm's shares is closely related to the profit it earns, corporate risk can also be termed as the possibility of a company's actual Profits After Tax (PAT) being different from the expected PAT. For a corporate, downside risk may stem from the possibility of either costs being higher than expected, or revenues being lower than expected. Similarly, the upside risk may result from either the possibility of costs being lower than expected, or the possibility of revenues being higher than expected. Hence, financial risk management is of paramount importance for any company.

In the previous unit, we discussed International Trade and Finance. Let's now discuss financial risk, an integral part of any business – domestic or international.

19.2 Objectives

After reading through the unit, you should be able to:

- Identify the potential risks in a business that would affect the business operations
- Explain risk management using derivatives such as futures, options and swaps
- Analyze the various types of futures to ensure their usage in different situations and for different commodities
- Determine the price of an option using the option pricing models
- Describe the functioning of swap markets to reduce the risks related to fluctuations in currency rates

19.3 Sources of Risk

Risks are an inherent part of every business. Thus, what is required by a business is to manage these risks effectively so that they do not affect their operations adversely. To manage the risks, the first prerogative is an understanding what these risks are and classifying them correctly. The various risks faced by a firm are interest rate risk, exchange risk, default risk, liquidity risk, business risk, financial risk, market risk, and marketability risk. While the list is not exhaustive, it does cover the most significant risks.

Interest Rate Risk

Interest rate risk is the risk of an adverse effect of interest rate movements on a firm's profits or balance sheet. Interest rates affect a firm in two ways – affecting the profits and affecting the value of its assets or liabilities. For example, a firm that has borrowed money on a floating rate basis faces the risk of lower profits in an increasing interest rate scenario.

Exchange Risk

Exchange risk is the risk of the possibility of adverse effect on the value of a firm's assets, liabilities, or income, as a result of exchange rate movements. Adverse movements in exchange rate can affect a firm's profits, assets or liabilities, even if it is not operating in foreign markets. This happens due to the inter-linkages between the various markets.

Default Risk

Default risk is the risk of non-recovery of sums due from outsiders, which may arise either due to their inability to pay or unwillingness to do so. This risk has to be considered when credit is extended to any party.

Liquidity Risk

Liquidity risk refers to the risk of a possible bankruptcy arising due to the inability of the firm to meet its financial obligations. There is a misconception that a profitable firm will have little or no liquidity risk. It is possible that a firm may be very profitable but may have a severe liquidity crunch because it has blocked its money in illiquid assets.

Business Risk

Business risk is the risk faced by a business from its external and internal environment. The risk may come from internal factors like labor strike, death of key personnel, machinery breakdown, or external factors like government policy, changes in customer preferences, etc.

Financial Risk

Financial risk refers to the risk of bankruptcy arising from the possibility of a firm not being able to repay its debts on time. The higher the debt-equity ratio of a firm, the higher the financial risk it faces. Liquidity risk and wrong capital structure are the prime reasons for financial risk.

Market Risk

Market risk is the risk that arises when the value of a firm's investments goes down as a result of market movements. It is also referred to as price risk. Market risk cannot be distinctly separated from other risks defined above, as it results from interplay of these risks. Interest rate risk and exchange risk contribute most to the presence of market risk.

Marketability Risk

This is the risk of the assets of a firm not being readily marketable. The situation of having non-marketable assets may or may not be linked to a need for funds. When such assets are required to be sold due to a need for funds, their non-marketability may lead to liquidity risk.

Example: Is Interest Rate Risk Limited to Bonds?

On May 4, 2022, as the RBI increased the key interest rate by 40 basis points, to tame inflation, the Sensex plunged more than 1,400 points, in the intra-day trade, to close at 55,669.03, while the NSE Nifty recorded a fall of 391 points and settled below 16,700.

The stock market index and the interest rates have an inverse relationship. A hike in the repo rate prompts companies to also cut back on the spending on the expansion. This leads to a dip in growth and affects the profit and future cash flows of companies, resulting in a fall in stock prices. When many follow this suit, it eventually leads to a fall in markets.

Sources: (i) https://www.hindustantimes.com/business/how-change-in-repo-rate-affects-stock-markets-101651668114172.html (Accessed on 16th May 2022)

(ii): https://www.business-standard.com/podcast/finance/impact-of-rbi-s-repo-rate-hike-on-borrowers-investors-and-the-economy-122050500086_1.html (Accessed on 16th May 2022)

19.4 Risk Management

A business organization is exposed to different types of risks, more so if it is operating in an international environment. These risks may impact the profitability and long term growth prospects of a business severely. Hence, managing risk is an integral component of the survival and growth of an organization. Corporate risk management refers to the process of a company attempting to manage its risks at an acceptable level. It is a scientific approach to deal with various kinds of risks a corporate faces.

According to Mark Dorfman, risk management is "the logical development and execution of a plan to deal with potential losses." It is a dynamic process which changes according to the evolving scenario. The aim of risk management is to maintain overall and specific risks at the desired levels, at the minimum possible cost.

There is a misconception that the goal of risk management is the complete elimination of risk. In reality, risk management aims at ensuring that risk remains at the desired and acceptable level, or within an acceptable range. Complete elimination of risk can take place only when no business activity is undertaken. In fact, the returns earned on government securities, which is generally referred to as the risk-free rate of return, is also not free from risks. The only risk such investments do not carry is default risk. In order to earn returns, it is essential to bear some risks. Risk management only aims at bringing the risk to a level that is in line with the returns expected to be generated by the investment.

Example: Risk Management Rules for Mutual Funds

SEBI, in Sept 2021, tightened risk management rules for mutual funds. These rules which are intended to protect the interest of investors include specific guidelines to identify, measure and report various risks. These new rules mandate three things:

1. Appointment of a chief risk officer
2. Creation of risk management committees
3. Maintaining metrics such as investment risk, liquidity risk and credit risk for each scheme.

SEBI also provided detailed guidelines for an asset management company's board, trustees, chief executive officer, chief investment officer, other senior officials and fund managers in their respective risk management roles.

Sources:(i) https://www.business-standard.com/article/markets/on-sebi-diktat-mutual-funds-step-up-hunt-for-risk-professionals-122032901531_1.html (Accessed on 16th May 2022)

(ii):https://www.thehindubusinessline.com/money-and-banking/sebi-tightens-risk-management-rules-for-mutual-funds/article36706277.ece (Accessed on 16th May 2022)

19.4.1 Approaches to Risk Management

There is no standardized approach for managing risks in an organization. Each organization may have to evolve its own strategy to manage risks. However, there are some time tested approaches that can be referred to while evolving a risk management strategy of its own by an organization. Following are the different approaches to managing risks:

Risk Avoidance

An extreme way of managing risk is to avoid it altogether. This can be done by not undertaking the activity that entails risk. For example, a corporate may decide not to invest in a particular industry because the risk involved exceeds its risk bearing capacity. Though this approach is relevant under certain circumstances, it is more of an exception rather than a rule. It is neither prudent, nor possible to use it for managing all kinds of risks. The use of risk avoidance for managing all risks would result in no activity taking place, as all activities involve risk, while the level may vary.

Loss Control

Loss control refers to the attempt to reduce either the possibility of a loss or the quantum of loss. This is done by making adjustments in the day-to-day business activities. For example, a firm having floating rate liabilities may decide to invest in floating rate assets to limit its exposure to interest rate risk.

Combination

Combination refers to the technique of combining more number of business activities in order to reduce the overall risk of the firm. It is also referred to as

aggregation or diversification. It entails entering into more than one business, and these different businesses have the least possible correlation with each other. The absence of a possible correlation results in at least some of the businesses generating profits at any given time. Thus, it reduces the possibility of the firm facing losses.

Separation

Separation is the technique of reducing risk through separating parts of businesses or assets or liabilities. For example, a firm having two highly risky businesses with a positive correlation may spin-off one of them as a separate entity in order to reduce its exposure to risk. Or, a company may locate its inventory at a number of places instead of storing all at one place, in order to reduce the risk of destruction by fire.

Risk Transfer

Risk is transferred when the firm, originally exposed to a risk, transfers it to another party which is willing to bear the risk. This may be done in three ways. The first is to transfer the asset itself. For example, a firm into a number of businesses may sell-off one of them to another party, and thereby transfer the risk involved in it. The second way is to transfer the risk without transferring the title of the asset or liability. This may be done by hedging through various derivative instruments like forwards, futures, swaps and options. The third way is through arranging for a third party to pay for losses if they occur, without transferring the risk itself. This is referred to as risk financing. This may be achieved by buying insurance.

Risk Retention

Risk is retained when nothing is done to avoid, reduce, or transfer it. Risk may be retained consciously because the other techniques of managing risk are either too costly or because it is not possible to employ other techniques.

Risk Sharing

This technique is a combination of risk retention and risk transfer. Under this technique, a particular risk is managed by retaining a part of it and transferring the rest to a party willing to bear it. For example, a firm and its supplier may enter into an agreement, whereby, if the market price of the commodity exceeds a certain price in the future, the seller foregoes a part of the benefit in favor of the firm, and if the future market price is lower than a predetermined price, the firm passes on a part of the benefit to the seller.

19.4.2 Risk Management Process

Risk management needs to be looked at as an organizational approach, as management of risks independently cannot have the desired effect over the long-term. This is especially necessary as risks result from various activities in the

firm, and the personnel responsible for the activities do not always understand the risk attached to them.

Risk management function involves a logical sequence of steps. These steps are:

Determining Objectives

Determination of objectives is the first step in the risk management function. The objective may be to protect profits, or to develop competitive advantage. The management needs to decide the objective of risk management, so that the risk manager may fulfill his responsibilities in accordance with the set objectives.

Identifying Risks

Every organization faces different risks, based on its business, the economic, social, and political factors and the features of the industry it operates in. The industry specific risks can be the degree of competition, the strengths and weaknesses of its competitors, availability of raw material, factors internal to the company like the competence and outlook of the management, state of industry relations, dependence on foreign markets for inputs, sales or finances, capabilities of its staff, besides other innumerable factors.

Risk Evaluation

Once the risks are identified, they need to be evaluated for ascertaining their significance. The significance of a particular risk depends upon the size of the loss that it may result in, and the probability of the occurrence of such loss. On the basis of these factors, the various risks faced by the corporate need to be classified as critical risks, important risks, and not-so-important risks. Critical risks are those that may result in bankruptcy of the firm. Important risks are those that may not result in bankruptcy, but may cause severe financial distress. The not-so-important risks are those that may result in losses, which the firm may easily bear in the normal course of business.

Development of Policy

Based on the risk tolerance level of the firm, the risk management policy needs to be developed. The time-frame of the policy should be comparatively long, so that the policy is relatively stable. A policy generally takes the form of a declaration as to how much risk should be covered. In other words, how much risk the firm is ready to bear. For example, a policy may specify that a specific percentage, say 50%, of all risks are to be covered or that not more than a specific sum can be at risk at any given point of time.

Development of Strategy

Based on the policy, the firm then needs to develop the strategy to be followed for managing risk. The tenure of a strategy is shorter than a policy, as it needs to factor-in various variables that keep changing. A strategy is essentially an action plan, which specifies the nature of risk to be managed and the timing. It also specifies the tools, techniques, and instruments that can be used to manage these

risks. A strategy also deals with tax and legal problems. It may specify whether it would be more beneficial for a subsidiary to manage its own risk, or to shift it to the parent company.

Implementation

Once the policy and strategy are in place, they are to be implemented for actually managing the risks. This is the operational part of risk management. It includes finding the best deal in case of risk transfer, providing for contingencies in case of risk retention, designing, and implementing risk control programs, etc. It also includes taking care of the details in the operational part, like the back office work, ensuring that the controls are complied with, etc.

Review

The function of risk management needs to be reviewed periodically, depending on the costs involved. The factors that affect the risk management decisions keep changing, thus necessitating the need to monitor the effectiveness of the decisions taken previously. Sometimes, the decisions taken earlier may not prove to be correct, or the changing circumstances may make some other option more effective. A periodic review ensures that the risk management function remains flexible, and the tools, techniques and instruments used for managing risk change according to the changing circumstances.

19.4.3 Risk Management Techniques

There are two kinds of techniques that can be used for management of various categories of risk. These are: internal techniques and external techniques. Internal techniques are those that are a part of the day-to-day operations of the firm, while external techniques are those that require the company to enter into some kind of financial contract with a market entity. Both internal and external techniques can be used to manage different risks. The following section describes these techniques:

Management of Business Risk

Most of the business risks are not manageable, i.e., they have to be borne. However, some of these, operational risks can be managed by building flexibility into the operations. For example, if the designing of products is done in such a manner that standardized machines can be used for production purposes instead of specialized equipment, the risk of obsolescence of machinery is reduced to some extent. Some of the risks can be managed using external hedging techniques like insurance.

Management of Currency and Interest Rate Risk

Currency and interest rate risk can be managed using both external and internal techniques. The external techniques are mostly dependent on the use of derivatives. A company may use products like forwards, futures, options and swaps for managing these risks.

Activity 19.1

Nowadays as organizations expand, the risk involved in managing its business operations also grow at a higher pace, where companies seek advisory and consulting firms to have a dynamic financial risk management. KPMG is one such organization, a global network of independent member firms, offering financial audit, tax, and advisory services having their presence in Europe, China, India, Russia and Latin America. It provides a broad range of financial risk management services to international banks, insurance companies, asset managers, corporates and public clients;

You are required to identify the risk types and assess those risks to frame out the approach and risk management process, to satisfy the compliance demands and to improve the processes, governance and strategies across various business operations.

19.5 Futures

Futures contracts enable management of the risks that arise out of uncertainties in commodity prices. This gives two forms of scenarios to the trader who bought the future –

(i) The price of the commodity is fixed, so the price is assured, hence he is safeguarded against any increase in the acquiring price and

(ii) If the price of the commodity decreases in the market, he can offset the loss incurred in the future contract by buying the commodity at the lower rate in the spot market.

Futures contracts owe their origin to forward contracts. In other words, futures contracts are refined forward contracts. Forward markets took centuries to evolve, which initially provided good assurance against price uncertainties and, later on, started becoming more standardized and regulated. The difference between forwards and futures is given below in Table 19.1.

Year	Index Futures		Stock Futures	
	No. of contracts	Turnover in ₹ crore	No. of contracts	Turnover in ₹ crore
2021-22	93662982	8429378.3	265609687	21038937.56
2020-21	127599626	9047645.7	252830922	18098365.39
2019-20	94777881	6701072.5	257380338	14919550.78
2018-19	69824522	5568914.5	255533869	16147010.86
2017-18	57674584	4810454.3	214758366	15597519.71
2016-17	66535070	4335940.8	173860130	11129587.14

Source: https://www1.nseindia.com/products/content/derivatives/equities/historical_fo_bussiness growth.htm (Accessed on 17th May 2022)

Futures market is a fairly recent development. It has evolved to meet the needs of the farmers and merchants. Organized futures market in commodities had existed at the Chicago Board Of Trade (CBOT) since 1848. Over the years, it grew rapidly, in terms of volume and turnover. Today, it is the largest futures exchange in the world. Another exchange to reckon with is the Chicago Mercantile Exchange (CME). These two exchanges account for about 80% of the total volume of future contracts in the US.

Today, futures contracts are quite popular and are used by many; from farmers to financial institutions. All categories of people employ these instruments to hedge their risks. A farmer, who produces wheat, in order to realize a better price for his produce may go to an exchange and sell a futures contract. Similarly, a baker who is uncertain about the future price of the wheat may also go to an exchange and buy a futures contract. In these cases, neither the producer nor the buyer possesses exact information about the future price of wheat. Hence, they face the risk of the future price moving unfavorably. A futures contract proves to be invaluable to reduce the price related risk. It also serves as an instrument for some of the market participants to speculate on.

A futures contract can be defined as an agreement to buy or sell a standard quantity of a specific commodity at a predetermined future date and at a price agreed between the parties through open outcry, on the floor of an organized futures exchange.

Table 19.1: Main Differences between Forwards and Futures Contract

	Futures Markets	Forwards Market
Location	Futures Exchange	No fixed location (or OTC)
Size of contract	Fixed (Standard)	Depends on the terms of contract
Maturity/ payment date	Fixed (Standard)	Depends on the terms of contract
Counterparty	Clearing house	Known bank or client
Market place	Central exchange floor with worldwide network	Over the telephone with worldwide network
Valuation	Marked-to-market everyday	No unique method of valuation
Variation margins	Daily	None
Regulations in trading	Regulated by the exchanges concerned	Self-regulated
Credit risk	Almost non-existent	Depends on the counterparty
Settlement	Through clearing house	Depends on terms of contract
Liquidation	Mostly by offsetting the positions; very few by delivery	Mostly settled by actual delivery. Some by cancelation at a cost
Transaction costs	Direct costs such as commission, clearing charges, exchange fees are high; indirect costs, bid-ask spreads are low.	Direct costs are generally low, indirect costs are high in the form of high bid-ask spread.

Source: ICFAI Research Center

19.6 Standardization of Futures Contracts

A futures contract between two parties should specify in some detail the exact nature of the underlying asset, price, contract size, delivery arrangements, delivery months, tick size, limits on daily price fluctuation, and trading unit.

- **The Asset:** The underlying asset (such as Corn, Wheat or Foreign Currency) needs to be specified at the time of entering into the contract. If the asset is a commodity, it may be necessary to specify the grade of the commodity that is to be delivered.
- **The Prices:** The price agreeable to the buyer and the seller at the time of delivery of the future contract.
- **The Contract Size:** The amount of the asset that has to be delivered under one contract.
- **Delivery Arrangements:** The place for delivery needs to be specified at the time of the contract to avoid controversy.

- **Delivery Months:** A futures contract is referred to by its delivery month. For example, July Corn, means that the contract is for delivery in the month of July.
- **Tick Size:** The minimum price fluctuation or tick size allowed in this commodity by the exchange.
- **Limits on Daily Price Movements:** The daily price movement limits are specified by the exchange. If the price moves up by a limit, it is referred to as limit up, and if it moves down by a limit, it is referred to as limit down.
- **Trading Unit:** This specifies the minimum number of units that are traded on the exchange. For example, the trading unit for soybean oil is 60,000 pounds on CBOT exchange.

Price Quotations

The pricing conventions differ from one commodity to the other. The gold prices are quoted in cents per troy ounce of gold bullion, whereas the commodities contracts like oil are quoted in terms of cents per barrel, copper in cents per pound, soybeans and food grains in cents per bushel. However, the financial futures are quoted in US dollars per unit of foreign currency. On the other hand, the T-bills, Eurodollar futures are quoted on the basis of an index equal to 100 minus the interest rate on these instruments.

Futures quotations are found in many sources, such as newspapers, Reuters online software, and websites of exchanges like NSE, and in a more detailed fashion in the Commodity Trading Manual published by the CBOT. Open Interest

Example: Gold Futures Contracts

Until July 9, 2020, NSE accepted serially numbered gold bars produced by London Bullion Market Association (LBMA) approved refiners for settlement of the gold contracts traded on the commodity derivatives segment of the exchange. But from July 10, 2020, the NSE exchange launched NSE Refiner Standards (NRS) for BIS - Standard Gold. This enabled the acceptance of gold bars produced by the domestic refiners in India, for settlement of the gold futures contracts traded on the NSE platform

Source: https://www.business-standard.com/article/markets/nse-to-accept-gold-bars-produced-by-indian-refiners-for-settlement-120071000566_1.html (Accessed on 17th May 2022)

Open interest denotes the number of contracts that were "open" at the close of trading on the preceding day and the number of futures contracts that have to be settled on or before the maturity date.

For instance, if trader 'A' has bought two contracts from trader 'B' and sold one of them back to 'B' on the same day, the volume will be three contracts. This is because, 'A' bought two contracts and 'B' bought one contract, which add up to three. For the same example, the open interest will be one contract. This is because, trader 'A' bought two contracts and sold one of them, and B sold two

contracts and bought one of them. Therefore, traders 'A' and 'B' are left with one contract each, which gives us the open interest.

19.7 Mechanism of Futures Markets

Futures contracts are designed in such a way that their prices should always reflect the prices of underlying cash market. Futures contracts are traded in auctions markets, where the prices are order driven. In these markets, each broker and trader can buy at the lowest offered price and sell at the highest bid price. The liquidity is maintained by the participation of these buyers and sellers. Some of these buyers and sellers are hedgers, seeking to protect their investments. Some are speculators who are risk-takers trading in pursuit of profit, and incidentally keep bid and ask prices close together. It is to provide efficient trading in the system, while some are arbitrageurs who sell the futures contract and simultaneously buy the commodity. Thereby, they will make a profit on the difference. The activities of speculators and arbitrageurs also bring price alignment.

Any person (a hedger, speculator or arbitrageur), who wants to trade in futures, has to first open an account with a broker, who is a member of the clearing house, before placing an order. Brokers on a futures exchange open accounts for their clients, maintain account balances and report all the trading activity undertaken by their clients. The trading of each commodity/asset takes place at a specific location known as 'pit', through a system of 'open outcry' or 'screen based online system' during official trading hours. As the futures are exchange traded instruments, the contract obligation is not between the buyer and the seller of the contract even though the contract at the time of initiation is between two parties. Each contract is substituted by two contracts in such a way that clearing house becomes the buyer to every seller, and seller to every buyer.

Closing a Futures Position

Suppose a trader has an obligation under the terms of the futures contract to take/give delivery of the underlying asset. The three common ways in which the trader can settle or liquidate a futures contract is by means of physical delivery or cash settlement, offsetting and exchange Futures for Physicals (EFP).

Largest derivatives exchanges worldwide in 2020 and 2021, by number of contracts traded (in millions)

Rank	Name of the Exchange	In 2020	In 2022
1	NSE (India)	8,850.47	17,255.33
2	B3	6,342.88	8,755.77
3	Intercontinental Exchange	2,788.94	3,317.89

Contd. .....

4	Nasdaq	2,660.6	3,292.84
5	CBOE Holdings	2,614.11	3,095.69
6	Zhengzhou Commodity Exchange	1,701.85	2,582.23

Source: https://www.statista.com/statistics/272832/largest-international-futures-exchanges-by-number-of-contracts-traded/ (Accessed on 16th May 2022)

19.8 Motives behind using Futures

Organizations that want to hedge their risks are more inclined to futures markets as they give benefits such as flexibility, minimizes price risk, offers liquidity etc. Some such motives for using futures contracts are:

19.8.1 Price Discovery

Price discovery is estimation of future cash prices of an underlying based on the prices of futures contracts. By using the information available in the futures market today, the market participants can estimate the prices of a given commodity at a certain point of time in future. The forecasts made on the basis of futures prices compare in accuracy quite favorably with other kinds of forecasts.

19.8.2 Hedging

As mentioned above, futures markets were formed originally to meet the needs of farmers and merchants. One can take position solely for the purpose of establishing a known price level – weeks or months in advance – and for either going long or short in the cash market to minimize the risk. An individual who hedges is called the 'Hedger' and the activity of trading in futures to control or reduce risk is called as 'Hedging'.

Hedgeable and Non-Hedgeable Risks: The futures market has two main types of foreseeable risks (i) Price Risks and (ii) Quantity Risks. While price risks relate to unexpected changes of prices of a commodity in the future, quantity risks relate to the future output of a commodity. Price risks can be hedged by taking positions in the futures or options markets and the hedging helps ensure avoiding losses. Price risks are also known as hedgeable risks. Quantity risks are also known as non-hedgeable risks, as they cannot be accurately quantified and hedged, as quantity output is more an act of God and depends on the outcome of nature.

Optimal Hedging Ratio

A general question that arises in the mind of anyone dealing with futures is what the optimal hedging ratio is, or how many futures contracts should be acquired or sold to minimize the risks. The optimal hedging ratio can be understood as under:

Hedge Ratio (HR) = Qf (Quantity of futures units)/Qc (Quantity of current units being hedged)

or

Value of HR = Qc x ΔCP (Change in price of current units) – Qf x ΔFP (Change in price of futures contracts) which is taken from the formula basis. Equalizing the variance to 0, we get

$$Qc \times \Delta CP = Qf \times \Delta FP,$$

So, $Qf = Qc \times \Delta CP / \Delta FP$ or 'n' other works

$$Qf = Qc \times HR.$$

Now, let us assume that the No. of Futures Contracts = NFC and the quantity of the commodity represented by the futures contract is Qfc, therefore,

$$Qf = NFC \times Qfc$$

Equalizing both the equations, we get

$$NFC \times Qfc = Qc \times HR$$

$$\text{So, } NFC = Qc/Qfc \times HR.$$

The Minimum Variance Hedge Ratio

Ederington and Johnson employ portfolio theory to derive the mathematical model that defines the minimum-variance hedge ratio (h) as the proportion of the futures to the cash position that minimizes the net price change risk. The minimum-variance hedge ratio is obtained as under:

$$h = F_p \frac{\sigma S_p}{\sigma F_t}$$

Where,

h = Hedge ratio

F_p = Coefficient of correlation between Sp and Ft

σF_t = Standard deviation of Δ Ft

σ_{S_p} = Standard deviation of Δ Sp

ΔF_t = Change in futures price during the period of hedging

Δ_{S_p} = Change in the spot price during the period of hedging.

19.9 Futures Prices

As the futures contract requires the delivery of some goods at a particular time in future, we can make it sure that the expectations of the market participants assist to determine the futures prices. Similarly, the cost of storing the goods underlying the futures contract helps to determine the relationship between the futures prices and the cash prices. So, we can conclude that all these futures pricing issues are interconnected.

19.9.1 Relationship between Futures Price and Cash Price

In a spot/cash market a commodity has a cash/spot price and the commodity is for immediate delivery. In a futures market, the commodity is delivered at a later date at the agreed price. Cash prices vary from one place to the other and from one commodity to the other, which depends on the demand for and supply of the commodity and the transportation cost involved.

Basis

Basis is the relationship between the cash price and the futures price of a commodity. Also, it is the difference between the cash price and the future price of the commodity.

Basis = Current cash price – Futures price.

When the futures contract is at expiration, the futures price and spot price of a commodity should be the same; hence, the basis must be zero. This behavior pattern of the basis over a period of time is referred to as 'convergence'.

Basis Risk

If the hedge can eliminate the full risk, it is known as perfect hedging. During the life of a futures contract, the difference between the spot prices and future prices may change, which causes basis risk. In short, basis risk may occur because of imperfect hedging between the spot price of the asset to be hedged and the futures price of the contract used.

Spreads

The difference between two futures price is referred to as 'spread'. For the same underlying goods, if there are two different prices on two different expiration dates, the underlying spread is referred as 'intra commodity' spread (also known as a 'time spread'). If the spread is between two futures prices for two different but related commodities; such as corn oil futures and cottonseed oil futures, it is referred to as 'inter commodity spread'. If the price difference is between two markets for the same commodity, it is known as 'inter-market spread'.

19.9.2 Determining Futures Prices

The extent to which the futures price exceeds the cash price at one point of time is determined by 'cost-of-carry' (or carrying costs), which includes storage, insurance, transportation and financing costs. Carrying costs play a crucial role in determining pricing relationships between the spot and futures prices. Moreover, it plays a key role in determining the prices of future contracts of different maturities. Following formula determines the relationship between the cash price and the futures price of any commodity:

$$F_t,T = C_t + C_t \times S_t,T(T-t) + G_t,T$$

Where,

C_t = Cash price at time 't'

S_t,T = Annualized interest rate on borrowings

G_t,T = Storage costs

$T - t$ = Time period

F_t,T = The futures price at time t, which is to be delivered at time period T.

In common parlance, the industry refers the cost-of-carry as 'full carry futures price', which is nothing but estimated cost of futures price. Hence, there will be two market prices in the market, namely, the actual market price and calculated full-carry price (which is obtained by using the above formula).

Example: Prices of Oil Futures in the US Markets

While the inflation in the US, and the slowing down of economic activity in China, due to the COVID related lockdowns, was acting in one direction, the shortage of gas and crude oil due to the Russian invasion of Ukraine worked in the opposite direction when it came to the market prices of oil futures in the US markets. An estimated fall in demand in the early part of 2022 brought down the prices, but the shortage of supply in oil resulted in oil futures erasing early losses and ending strongly higher on May 16, 2022, pushing the prices into record territory.

Sources: (i) https://www.marketwatch.com/story/oil-ticks-lower-after-weak-china-data-underlines-demand-worries-11652702515?mod=futures (Accessed on 16th May 2022)
(ii)https://www.marketwatch.com/story/oil-prices-higher-but-poised-for-weekly-drop-11652447016? mod=futures (Accessed on 16th May 2022)

19.9.3 Convenience Yield

The shortage of the physical commodity is probably one of the reasons for having additional costs other than cost-of-carrying. When there is a shortage in a commodity, there is an implied yield (return) by holding the commodity. This yield is referred to as 'convenience yield'.

The Exhibit 19.2 tells in simple terms how a future transaction works and how it can be traded in the market.

Check Your Progress - 1

1. What is the risk of the possibility of adverse effect on the value of a firm's assets, liabilities or income, as a result of exchange rate movements called?
   a. Interest rate risk
   b. Exchange risk
   c. Default risk
   d. Liquidity risk
   e. Business risk

2. Which of the following risk is also referred to as "price risk"?
   a. Financial risk
   b. Business risk
   c. Market risk
   d. Marketability risk
   e. Exchange risk
3. Which of the following terms refers to the attempt to reduce either the possibility or quantum of loss by making adjustments in the day-to-day business activities?
   a. Risk avoidance
   b. Risk retention
   c. Risk transfer
   d. Separation
   e. Loss Control
4. Which of the following functions enables the risk manager to analyse whether the risk management function is achieving the set objectives or is there a necessity to find an alternative course of action, when the results are not in accordance to the expectations?
   a. Risk evaluation
   b. Review
   c. Implementation
   d. Objective determination
   e. Development of policy
5. Who is the member who opens accounts for his/her clients, maintain account balances and all the trading activities for his/her clients?
   a. Clearing member
   b. Floor trader
   c. Broker
   d. Floor broker
   e. Position trader

19.10 Types of Futures

We have studied in the previous paragraphs that futures contracts help in facing the risks arising from fluctuations in commodity prices. This leads us to the question as to for which type of commodity can be futures contracts be applied. The answer to this question lies in the different types of futures contracts.

The different types of futures contracts traded fundamentally fall into four different categories based on the underlying asset. The underlying asset may be:

- A foreign currency (say Euro, Yen or Swiss Franc, etc.).
- An interest-earning asset (say a debenture or time deposit).
- An index (usually a stock index).

- A physical commodity (say, wheat, corn, etc.).
- Futures on individual stock (such as SBI, Infosys etc.).

19.10.1 Currency Futures

In 1972, CME was the first exchange to introduce the financial futures contracts. When countries imported a plethora of foreign goods it created a great demand for foreign currencies. Thus, huge volumes of international transactions led to the development of foreign currency markets, which in turn created the necessity for foreign currency futures.

Currency Futures can be defined as "a binding obligation to buy or sell a particular currency against another at a designated rate of exchange on a specified future date." British Pound, Canadian Dollar, Japanese Yen, Swiss Franc and Euro etc., are some currencies on which futures contracts are available.

19.10.2 Interest Rate Futures

In the currency futures the underlying assets for the futures contract is some currency, in case of interest rate futures the underlying assets will be any interest bearing instrument, like T-bills, T-notes, T-bonds, deposits, etc. "An interest rate futures contract is an agreement to buy or sell a standard quantity of specific interest bearing instruments, at a predetermined future date and at a price agreed upon between the parties."

Interest rate futures can be based upon both short-term (less than one year) and long-term debt obligation (more than one year). Examples of short-term interest rate futures are futures on US 90-day treasury bills and 3 months Eurodollar time deposits. In the case of long-term interest rate futures, the most important contracts are the Treasury bond futures contract, the 10-year Treasury note futures contract and municipal bond futures contract.

19.10.3 Index Futures

Index futures are one of the most popular types of futures as far as trading is concerned. An index futures contract is basically an obligation to deliver at settlement, an amount equal to 'x' times the difference between the stock index value on the expiration date of the contract and the price at which the contract was originally struck. The value of 'x', which is referred to as the multiple, is predetermined for each stock market index. For example, futures contracts on S&P 500 Stock Index use a multiple of 250, while the futures contracts on BSE Sensex use a multiple of 50. Stock index futures are based on complex cash instruments.

The multiple enables us to calculate the monetary value of an index futures contract. For example, if the settlement price of the S&P 500 futures contract is 350, the value of the contract in monetary terms is 350 x 250 = USD 87,500.

The following details pertain to American Index Futures on 16th May, 2022 at 1:53 AM EDT.

Name	Time (EDT)	Future Date	Last	Net Change	Open	High	Low
DM1: IND Dow Jones mini	1:53 AM	Jun-22	32,273.00	+114	32,139.00	32,288.00	32,129.00
ES1: IND S&P 500 mini	1:53 AM	Jun-22	4,024.75	+20	4,002.00	4,028.75	4,000.50
NQ1: IND NASDAQ 100 mini	1:53 AM	Jun-22	12,340.00	+95.25	12,235.50	12,348.75	12,234.00
IS1: IND Mexican IPC	5/16/2022	Jun-22	50,330.00	+843	49,375.00	50,550.00	49,255.00
PT1: IND S&P/TSX 60	1:42 AM	Jun-22	1,224.40	+1.5	1,222.90	1,225.90	1,221.40
BZ1: IND Ibovespa	5/16/2022	Jun-22	1,09,270.00	+1,229.00	1,07,640.00	1,09,805.00	1,07,620.00
LB1: IND IBrX-50	5/16/2022	Jun-22	18,253.00	+231	18,096.00	18,096.00	18,096.00

The first column (DM1:IND Dow Jones mini) gives the name of the index future, and the second column (1:53 AM) the time (in ESD) the data is accessed. The third column (Jun-22) gives the maturity of the contract (the month during which the contract will expire). The fourth column (32,273.00) gives the last traded price and the fifth column (+114) increase (+) or decrease (-) in price. The sixth column (32,139.00) indicates the price at which the future opened on that day. The seventh and the eighth columns, High (32,288.00) and Low (32,129.00), denote the highest and the lowest price at which a particular contract has been traded during that day.

Source: https://www.bloomberg.com/markets/stocks/futures (Accessed 17th May 2022)

19.10.4 Commodity Futures

A futures contract, where the underlying asset is a commodity, is referred to as a commodity futures contract. There are various commodities on which futures contracts are available. Some of the commodities such as corn, soyabeans, sugar, cotton, coffee seeds, etc. which indeed form a part of daily consumption, are traded on the futures exchange. Though all of them form a part of agricultural

commodities, they are further segregated into grains, soft commodities, and meat futures.

In addition to the above, there are several other commodities such as gold, silver, copper, petroleum products consisting; heating oil, crude oil, gasoline and propane that are traded on futures market, and are referred to as metal and energy futures.

19.11 Options

Options are preferred as they remove the hindrance of both the parties having an obligation to execute the contract on a specified day. In case of options, the buyer only enjoys the right but it is not an obligation. Hence, the buyer can choose to withdraw. This makes it a favorite for hedgers as it promises unlimited profits with limited losses.

Options and Futures are referred to as 'Derivatives', which are the result of unrelenting search for better financial instruments. They derive their value from an underlying commodity or a financial asset. However, options have the advantage over futures in that they are not obliged to buy or sell a certain asset. Options on commodities have existed in different forms since 1860 for products as diverse as gold, wheat, and tulip bulbs in the US. An active over-the-counter market in stock options has also existed there for nearly a century.

An options contract entitles the holder to buy or sell a designated security or other financial asset such as foreign currency; at or within a certain pre-specified time at a particular price. While the options holder is entitled to buy or sell, he is not obliged to. That is, options carry a right without an obligation. From the angle of the seller of the options, who is also called the writer of the options, the liability can be unlimited, if the buyer chooses to exercise the options. An options contract is different from other derivatives in that it provides a downside protection against risk and also an upside benefit from favorable movements in the underlying asset prices.

19.11.1 Types of Options

There are certain types of options, two are presented as follows:

European Options

Options, which can be exercised only at a specified time, are known as European Options.

American Options

Options, which can be exercised at any time during a specified period, are known as American Options.

Some Basic Concepts in Options

It is necessary to understand certain basic terms and concepts:

Call Option

An options contract is called a 'call option', if the writer gives the buyer of the option, the right to purchase the underlying asset from him.

Put Option

An options contract is said to be a 'put option,' if the writer gives the buyer of the option, the right to sell the underlying asset.

Option Premium or Option Price

It is the premium (price) paid by the buyer of the option to the seller and is paid at the time of entering into the option contract. This is the amount which the buyer of the option (whether it be a call or put option) has to pay to the option writer to induce him to accept the risk associated with the contract.

Expiration Date

It is the date on or before which the option should be exercised. If not exercised on or before the date, the option lapses and cannot be exercised thereafter. Therefore, an option is a wasting asset.

Expiration Cycle

The options listed in the stock exchanges and introduced in certain months expire in specific months of the year only. This is due to the fact that option contracts have to expire within nine months from the date of their introduction. Exchanges previously used to assign an issue to one of the three cycles. First is January, April, July and October; other is February, May, August and November; third is March, June, September and December. This has been modified now to include both the current month and the following month, plus the next two months in the expiration cycle so that the investors are always able to trade in the options. Therefore, now the first cycle will be January, February, April and July, the second cycle will be February, March, April and July and the final cycle will be March, April, July and October.

Strike Price

It is the price at which the holder of the option can buy (or sell) the asset on which the option was written. The option can be exercised only at the strike price, irrespective of the price of the asset in the market at the time of exercise.

Options Series

All options of a type are referred to as belonging to the same class of options. For example, put options are a class.

In-the-Money

When an option is 'In the Money', the option, if exercised, will provide the holder with a profit. A call option is 'In the Money', if the market price at the time of exercise is greater than the exercise price. The reverse applies to a put option.

Out-of-the-Money

An out of the money option is worthless. A call option goes out of the money if the market price is less than the exercise price, as the holder will be better off buying the asset from the market. Again, the reverse applies to a put option.

At-the-Money

An option whose exercise price is equal to the current spot price is said to be at-the-money.

Example: Exercise Mechanism of Options Contracts

On Jan 3, 2022, SEBI tweaked the "exercise mechanism" of options contracts on commodity futures. The decision was a result of the feedback received from stock exchanges and the recommendations of the Commodity Derivatives Advisory Committee of SEBI. On expiry, all 'in the money' option contracts will be exercised automatically, unless 'contrary instruction' has been given by long position holders and, all the 'out of the money' option contracts shall expire worthless.

Sources: (i)https://www.thehindubusinessline.com/markets/sebi-simplifies-process-for-exercising-commodity-options-contract/article38105735.ece (Accessed 17th May 2022)

(ii)https://www.business-standard.com/article/pti-stories/sebi-tweaks-exercise-mechanism-of-options-on-commodity-futures-122010300947_1.html (Accessed 17th May 2022)

19.12 Factors Influencing Option Prices

The value of the option depends on the price of the stock in the market and the exercise price of the option. Understanding the factors enables the trader to choose the right option price. For example, the value of a call option for a holder is Max (S – E, 0). However, prior to the time of expiration, the value of an option depends on some more factors other than the stock price and exercise price. The factors and their impact make an interesting reading:

i. **The Stock Price (S):** It is obvious that the value of a call option increases with increase in stock price. In Max (S – E, 0), the value of S – E should be greater than zero, if the option should be of any value to the holder. When (S – E) > 0, higher is the value of S, greater is the value of the option. The reverse holds good for a put option.

Example: Stock Price and Call Options

On May 4, 2022, as the RBI increased the key interest rate by 40 basis points, the NSE Nifty recorded a fall of 391 points and settled below 16,700. The prices of many rate-sensitive shares, like NBFCs and HFCs, fell on that day and the days following due to FPIs also leaving the market after the rise of rates by the US Federal Reserve. When stock price (S) fell below the exercise price (E), Max (S – E, 0) became '0'. Thus, the fall in stock prices below the exercise price in the call option market, made many call options out of money, i.e., worthless in May 2022.

Source: https://www.business-standard.com/article/markets/rate-hike-impact-rate-sensitive-shares-tumble-as-rbi-s-ups-rate-by-40bps-122050400582_1.html (Accessed May 25, 2022)

ii. **Exercise Price (e):** Following the same logic we used in (i) above, we can infer that the impact of the exercise price on the value of an option is just the opposite to that of the stock price. The value of a call option decreases, while the value of a put option increases with increase in the exercise price.

iii. **Volatility of Stock Price (σ) :** Volatility of stock price increases the value of both call and put options. This is because, the possible loss being limited to the premium paid, the possibility of profit varies directly with the anticipated volatility of the stock price.

iv. **Time to Expiration (t):** Longer the time to maturity, higher is the value of an option. This is because longer the time available, higher is the possibility of fluctuation in the stock price which increases the possibility of a higher pay-off.

v. **Interest Rate (r): The** higher the interest rate, the higher the value of a call option. This is because as interest rates increase, the effective value of the amount payable on exercise of a call option gets reduced, increasing the value of the option, while in the case of a put option, the value of the amount receivable on exercise falls, thus bringing down the value of the option with it.

vi. **Risk-free Interest Rate:** Whenever interest rates in the economy rise, the expected growth rate of the stock price increases but the present value of all the future cash flows to be received by the owner of the option declines. For the calls, the increase in the growth rate of the stock price enhances its value; however, the present value effect tends to decrease it.

vii. **Dividends:** The value of stock increases in anticipation of dividend declaration and the same declines after the record date. Hence, the price of European call option, whose expiry date is beyond the record date tends to decline, whereas that of put option tends to increase. In case of American options, the impact on the price will be similar to the impact described earlier with reference to stock price.

Example: Implied Volatility

Implied volatility is the volatility due to the effect of market sentiment on the future outlook of a stock. Along with truth and some influence of news/rumours on the market can also be seen on stock prices and consequently, the option prices. Thus, implied volatility is a consequence of traders in the market tweaking their trading patterns and habits as news/rumours pop up. Traders, due to their large volumes, can shift the supply-demand balance of any stock impacting its price and thereby the options having those stocks as their underlying assets.

Source: https://www.icicidirect.com/knowledge-center/article/the-impact-of-volatility-on-option-pricing (Accessed 19th May 2022)

19.13 Options Combinations/Trading Strategies

There are a variety of options combinations which traders can adopt to suit their risk-return profile. Options trading strategies would help the trader to profit from the unexpected movement of prices of the underlying asset in either directions.

Options traders often trade options in combination to benefit from unpredictable behavior in the prices of the underlying assets. Options prices are determined as a function of the price of the underlying asset, the time until expiration, risk-free interest rate, volatility of the underlying asset and the exercise price.

We will discuss the following option strategies in this section:

Covered Call Writing: This strategy involves buying the underlying asset and writing a call on that asset. This strategy will make sense to an investor who believes that a stock offers scope for a small price appreciation.

Protective Put: This strategy involves buying the underlying asset and buying a put on that asset. This strategy appeals to those investors who are particularly concerned with protection against downside fluctuations in stock prices. This protection, of course, has a cost in terms of the premium paid for buying the put. This cost can be reduced by buying an out-of-the-money put.

Straddle: A straddle involves a call and a put option with the same exercise price and the same expiration date. A straddle buyer buys a call and a put option, and the seller sells a call and a put option, at the same exercise price and on the same expiration date. The maximum loss associated with the long straddle position is the cost of the two options (the premium paid for buying the options). Profit potential is unlimited when the prices of the underlying asset rise significantly and limited when it falls significantly. This strategy will appeal to an investor who wants to take a position in an underlying asset that is volatile but does not have a clue whether it will rise or fall in the short run.

Strangle: It is a combination of a call and a put option with the same expiration date and different strike prices. If the strike prices of the call and the put options are X_1 and X_2, then a Strangle is chosen in such a way that $X_1 > X_2$. The strangle writer stands to gain only if there are no pronounced changes in the price of the underlying asset. Strips: A strip consists of a long position in one call and two puts with the same exercise price and expiration date. The buyer of a strip believes that there will be a big stock price move but the stock price is more likely to fall than it is to rise.

Straps: A strap consists of a long position in two calls and one put, with the same strike price and expiration date. A strap is like a strip that is skewed in the opposite direction. The buyer of a strap expects bullish and bearish possibilities for the optioned security with a price rise being more likely. This strategy will attract an investor who expects market to be volatile but thinks that it will rise in future.

Spread Strategies: Spread strategies are employed for exploiting moderately bullish or bearish beliefs about the market. Spread strategies involve only the use of options. There are three types of spreads - Vertical Spreads or Price Spread, Horizontal Spreads or Time Spread and Diagonal Spreads.

Example: Non-Correlated Trading Strategies

Successful traders use (trade) non-correlated trading strategies. They combine strategies that make money in a highly volatile market, with option selling strategies that work best in a non-trending market. When non-correlating strategies are chosen, one strategy may generate superior returns, while the other may give smaller returns or even a small loss. Big trading houses generally deploy 7 or 8 trading strategies simultaneously. This helps them in smoothening their profit curve. All their strategies may not be profitable, but diversification helps during drawdowns.

Source: https://economictimes.indiatimes.com/markets/stocks/news/investing-mantra-why-more-than-one-trading-strategy-should-be-deployed/articleshow/91394928.cms (Accessed 19th May 2022)

19.14 Options Pricing Models

Pricing of an option refers to the amount for which the option is traded. This amount referred to as premium represents a cost to the trader and hence should be fixed correctly. The below given pricing models aid the trader in arriving at this premium amount and in deciding whether to enter into an option contract at a specific price.

The range of prices, which the option can take during a particular period, is called as the boundary space for an option. The value of a call option will be the highest for an option with zero exercise prices and an infinite time to expiration. The value of such a call would be equal to the price of the underlying asset. The value of a put option at expiration should be max 0, X – ST, where X is the strike price of the put option, and ST is the underlying asset's price at expiration. The pricing of an option should include no arbitrage possibility also. There are more realistic options pricing models to determine the options' prices uniquely without any arbitrage possibility. The models are Binomial Option Pricing Model and Black Scholes Pricing Model.

19.14.1 The Binomial Model

This is the earliest option-pricing model and is also the simplest. The model was formulated for calculating the value of a European call option from which the value of a put option can be found. The underlying principles of this model are:

The current price of the stock, the value of the call option and the interest rates are so aligned that there is no possibility of making a riskless profit by using any combination of calls, puts, borrowing, and lending.

For a portfolio to be perfectly hedged, the combination of calls, stock and lending must be made in such a way that the pay-off from the portfolio at the end of the holding period is independent of the stock price. Investors, being risk-averse, hold only hedged portfolios.

The maximum and minimum values that can be reached by the stock price at the end of the maturity period are known. That is, the expected values are used.

We will use the following notations to describe the model:

S_0 : Current stock price

E : Exercise price

u : (1 + a) where **a** is the percentage upward change in the stock price during the maturity period of the option, expressed in decimals.

d : (1 – b) where **b** is the percentage downward change in the stock price during the maturity period of the option, expressed in decimals.

C : The call price

α : The number of shares to be purchased per call.

C_u : Value of the call if the stock price increases, i.e., Max ($uS_0 – E$, 0).

C_d : Value of the call if the stock price decreases; i.e., Max ($dS_0 – E$, 0).

r : (1 + r_f) where r_f is the risk-free rate of interest in percentage expressed in decimals.

Now, let us suppose that a portfolio is set-up by writing a call and buying S_0 number of shares financed with a borrowing of $C + S_0$. Then, according to the second principle mentioned above, if the portfolio should be perfectly hedged, the pay-off from the portfolio should be the same, whether the stock moves up or down.

Symbolically,

$$-C_u + \alpha uS_0 = -C_d + \alpha dS_0$$

or

$$\alpha = \frac{C_u - C_d}{S_0(u-d)}$$

If an amount equal to $[(C_u - \alpha uS_0)/r]$ or $[(C_d - \alpha dS_0)/r]$ is borrowed, the net cash flow at the end of the holding period becomes zero. This is because the outflow would be $-(C_d - \alpha uS_0)$ or $-(C_d - \alpha dS_0)$ towards the repayment of the loan. If the net inflow is zero, then if the investor should not make a loss, the initial investment should also be zero. This holds good, as the portfolio has been set-up in such a way, that he does not recall that the portfolio is a mixture of buying and borrowing. The buying has been financed with the borrowing. Now, equating the initial investment and the pay-off if the stock moves down, we get

$$C = \frac{\alpha r S_0 - Cd - \alpha d S_0}{r}$$

Substituting for α with

$$= \frac{C_u - C_d}{S_0(u-d)}$$ in the above equation, we get

$$C = \frac{C_u \frac{r-d}{u-d} + C_d \frac{u-r}{u-d}}{r}$$

19.14.2 Black and Scholes Model

We have been, until now, using combinations of stocks, options, and loans. In the Put-Call Parity Theorem, we used a stock, a put option and a loan in such a way that the pay-offs from the stock and put are equal to the pay-off on the call option. In the binomial model, we used a portfolio of a call option, stock, and borrowing. The same procedure can be applied in this model too. We may set-up a portfolio of a stock and a loan in such a way that their pay-off is identical to that of a call option and equate their value to the value of a call option. But if the stock prices change continuously, the proportions of the stock, call, and loans will also have to be changed continuously. That makes the pricing process tedious. But, the same can be achieved using the Black and Scholes Model for option valuation. The basic formula of the model is:

Value of the call option = [delta x share price] – loan

In the formula, delta is the amount to be invested in the underlying stock to build a fully hedged portfolio. The term delta is expressed symbolically as $N(d_1)$, and the loan as $N(d_2)$ x PV (EX). $N(d_1)$ and $N(d_2)$ are the cumulative probabilities of a random variable taking values less than or equal to d_1 and d_2 respectively. The $N(d_1)$ and $N(d_2)$ values can be looked up from the table of areas under the normal distribution.

Now, $d_1 = \frac{\ln\left\{\frac{S_0}{PV(E)}\right\}}{\sigma\sqrt{t}} + \frac{\sigma\sqrt{t}}{2}$

$d_2 = d_1 - \sigma\sqrt{t}$

PV(E) = Present value of the exercise price calculated by discounting at the continuously compounded risk-free rate.

t = Number of periods in years.

S_o = Price of the stock now.

σ = Standard deviation of the continuously compounded rate of return on the stock per period.

In = Natural logarithm.

Though the formula appears complicated, a little practice will make it easy to use. This formula has been found to be very versatile. It not only gives the option values which conform very closely to the real world situations, but also can be

used to value assets with a wide range of features such as foreign currency, bonds, futures, and real assets, which is why we are studying the model here.

Assumptions of Black and Scholes Model

It is necessary to understand the implication of the assumptions made by the Black and Scholes model:

i. The stock pays no dividends during the option's life

   Most companies pay dividends to their shareholders, so this might seem a serious limitation to the model considering the observation that higher dividend yield elicits lower call premiums. A common way of adjusting the model for this situation is to subtract the discounted value of a future dividend from the stock price.

ii. Markets are efficient

   This assumption suggests that people cannot consistently predict the direction of the market or of an individual stock.

iii. There are no transaction costs or taxes

   Usually market participants do have to pay a commission to buy or sell options. Even floor traders pay some kind of fee, but it is usually very small. The fees that individual investors pay is more substantial and can often distort the output of the model.

iv. Interest rates remain constant and known

   The Black and Scholes model uses the risk-free rate to be constant and to be a known rate. During period of rapidly changing interest rates, these 30 days rates are often subject to change, thereby violating one of the assumptions of the model.

v. Returns are log-normally distributed

   The assumption underlying the Black and Scholes model is that stock prices follow random walk which means that proportional changes in the stock price in a short period of time are normally distributed. This in turn implies that the stock price at any future date, has what is known as a log-normal distribution.

vi. European exercise terms are used

   European exercise terms say that the option can only be exercised on the expiration date. American exercise terms allow the option to be exercised at any time during the life of the option, making American options more valuable due to their greater flexibility.

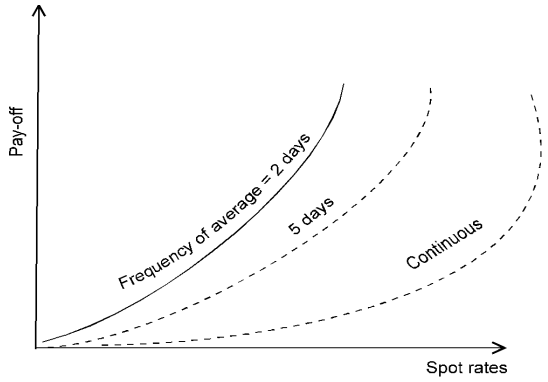
19.15 Exotic Options

Options which are more complicated than the standard European or American options are referred to as exotic options. Most of them are traded in the over-the-counter market, and are designed by financial institutions to meet the specific requirements of the clients. These are used in the marketplace either for yield enhancements or disaster insurances. Given below are different types of exotic options.

Asian Options

Asian options are used to avoid manipulation of the prices of the options on the underlying asset by the traders of the options, which might turn harmful to the issuer of the underlying asset. These are options whose pay-off depends on the average price of the underlying asset during a pre-specified period of the life of the option as shown below in Figure 19.1

Figure 19.1: Asian Options



Source: ICFAI Research Center

Barrier Options

These are the options whose pay-off depends on whether the underlying asset price reaches a certain level during a certain period of time.

Bermudan Option

It is a non-standard American option in which early exercise is restricted to certain dates during the life of the option, but the exercise price is always the same.

Binary Options

These are options, which have discontinuous payoffs. For instance, a cash-or-nothing call pays off nothing, if stock price is below the strike price and pays a fixed amount, say, Q, if the stock price rises above the strike price.

Chooser Option

A chooser option is one in which the option holder has a choice to make an option, as either a call, or a put option after a specified period of time. These are also called as-you-like-it options. These are useful for hedging a future event that has a high level of uncertainty in occurrence.

Compound Options

These are options on options. There are four main types of compound options, viz.,

a call on a call; a call on a put; a put on a call; a put on a put.

Forward Start Options

These are options paid for now but will start at a certain time in future. The exercise price is specified to be the current price at the beginning of the option's life. For a forward start option, there are three dates to consider, viz., the valuation date, the date the option life begins, and the expiry date of the option. The following figure illustrates a forward start option profile.

Three time periods involved are denoted by t_1, t_2 and t_3. Here $t_{123.}$

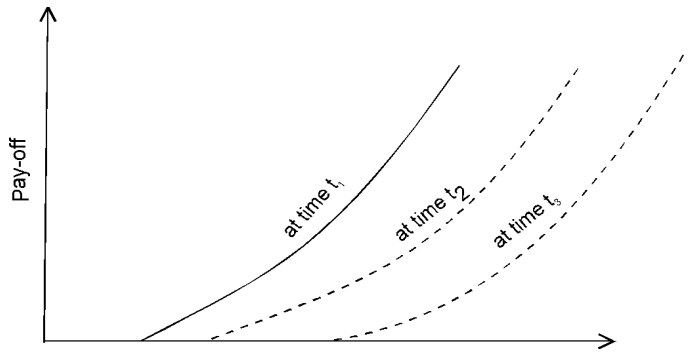
t_1 indicates the valuation date.

t_2 indicates the time at which the option begins.

t_3 indicates the expiry date.

Figure 19.2 presents a diagrammatic representation of forward start option

Figure 19.2: Forward Start Option



Source: ICFAI Research Center

Flex Options

These are options where the traders agree to non-standard terms. These non-standard terms may involve strike prices or exercise dates. These options were created by the stock exchanges, which dealt in options in order to attract back the investors who were showing more interest towards the Over-The-Counter options.

Look-back Options

The payoffs from these options depend on the maximum or minimum stock price reached during the life of the option. Assume that you hold a Look-back call. What does it imply? You can buy the underlying asset at the lowest price achieved during the life of the option. Similarly, if you hold a Look-back put option, you can sell the underlying asset at the highest price achieved during the life of the option.

Rainbow Options

These are options involving two or more risky assets. For example, there is an option called basket option, whose pay-off depends on the value of a portfolio of assets.

Exchange Options

These are options to exchange one asset for another under which in return for foregoing one asset, the investor can receive another asset.

Home-made Artificial Options

It is possible to create patterns similar to options in order to produce the pay-off features of the options market for other securities like treasury bills. This is a type of portfolio insurance.

Hedging Exotic Options

Hedging exotic options may not be as simple as hedging regular options. It is sometimes easier to hedge using the underlying asset as compared to hedging with the plain vanilla option.

Example: **Exotic Derivatives**

In April 2020, non-retail users with a net worth above ₹500 crore are permitted to enter into exotic derivatives. With India's expanding global trade integration, the return of exotic forex derivatives and the introduction of swaptions gives corporates more risk-management options. In April 2022, after the Reserve Bank of India allowed lenders to offer derivative products, banks such as ICICI Bank Ltd. and Axis Bank Ltd. sold barrier forex options to customers including Reliance Industries Ltd. and Supreme Petrochem Ltd. Derivative products were banned in the aftermath of the 2008 financial crisis when a large number of firms were left with huge losses on bets gone wrong.

Sources: (i) https://www.financialexpress.com/market/rbi-eases-currency-rules-how-it-will-change-the-way-investors-trade-in-foreign-exchange/1926602/ (Accessed on May 20, 2022)

(ii) https://www.bloomberg.com/news/articles/2022-01-19/exotic-forex-derivatives-return-in-rbi-s-push-to-deepen-markets (Accessed May 20, 2022)

19.15.1 Uses of Options

Options have the following uses:

i. **Reducing the variability of returns on stocks:** An investor can ensure that low returns are eliminated and high returns are levelled by exercising an option.

ii. **Betting on information:** Based on the information and rumours floating the market, investors can benefit by purchasing options to gain from the volatility of the stock.

iii. **Combine optimal portfolio:** Options can be combined with other fixed income securities, thus creating a portfolio with characteristics of a fixed income security. Lending and borrowing at more attractive rates will be possible on such a portfolio.

Activity 19.2 Futures and options are the two commonly traded derivatives in stock exchange. As a stock trader in commodities market, analyze and interpret how futures differ from options. What suggestions would you provide as a trader to an investor? **Answer:**

19.16 Financial Swaps

While futures and options contracts relate to underlying assets such as commodities, stocks etc., swaps have evolved to enable traders to exchange financial instruments (especially currency and interest rates). It helps in hedging against the risks of interest rate fluctuations or exchange rate fluctuations.

The term 'swap' has two different meanings in the financial markets. In one definition, it refers to the simultaneous purchase and sale of currency for different maturities or vice versa. The other definition states that it is the agreed exchange of future cash flows with or without any exchange of cash flows at present. The term "Swaps" have been defined differently as:

- A transaction in which two parties agree to exchange a pre-determined series of payments over time
- An agreement between two parties to exchange interest payment for specific maturity on an agreed-upon notional amount
- An arrangement whereby one party exchanges one set of interest payments for another, for example, fixed for floating rate

Swaps can be used to convert liabilities or assets to the benefit of the owner. Hence it is an agreement between two parties to exchange a series of payments, the terms of which are pre-determined. If the terms provide for exchange of interest payments without involving exchange of principal payments, it is normally referred to as an interest rate swap. If the terms of agreement also provide for exchange of principal, which normally happens when two currencies are involved, it is called a currency swap. Swaps can be divided into short-term, medium-term and long-term swaps. While short-term swaps have maturity periods of less than three years, medium-term swaps mature between three and five years, and long-term swaps have a life extending beyond five years.

19.16.1 Evolution of Swap Market

The swap market came into existence in the late seventies when currency traders employed the technique of swaps to evade British controls on the movement of foreign currency. The first interest rate swap took place in London in 1979; and further in 1981, Salomon Brothers negotiated a benchmark currency swap between IBM and the World Bank. In 1981, the swap market was worth a few hundred million dollars, but today it is worth several trillion dollars, divided into interest rate swaps and currency swaps; and it is still growing. Most of the capital market issues are swapped today, with a few exceptions.

Later in 1984, especially in the US dollar interest rate swap market, banks started developing warehousing whereby a single counter-party would approach them and without another counter-party, the bank would enter into a swap arrangement with them. A temporary hedge would be taken in the bond or futures market until a suitable counterparty could be found. Standard terms introduced by the International Swap Dealers Association (ISDA) and British Bankers' Association (BBA) in 1985 also assisted growth in the swap market.

19.16.2 Basic Terms

Swap Facilitators: Swaps are mutual obligations among the swap parties. But it may not be necessary for the counter-parties involved in a swap deal to be aware of each other because of the role assumed by a swap dealer (market maker) or swap broker. Collectively, the swap facilitators are known as 'Swap Banks' or simply 'Banks'.

Swap Broker: When a swap facilitator does not take any financial position in a swap arrangement, he initiates and dissociates himself from the deal after making an arrangement between the counter-parties who have approached him, then he is called a 'swap broker'.

Swap Dealer: Swap dealer bears the financial risk associated with the deal he is arranging in addition to the functions of a swap broker, and becomes an actual party to the transaction.

Swap Coupon: The fixed rate of interest on the swap.

Notional Principal: The principal amount on which the interest calculation is made.

Basis Points (BP): Basis point is 1/100th of 1% i.e., 10 basis points = 0.1%.

Trade Date: It is the date on which swap is entered into. This is the date when both the parties have agreed for a swap.

Effective Date: Effective date is the date when the initial fixed and floating payments begin. Effective date is also called value date. If the effective date is after two days of the trade date, then it is called spot date. The maturity of a swap contract is computed from the effective date.

Reset Date: The applicable LIBOR for each period is to be determined before the date of payment. It is usually determined before the commencement of the applicable period. Generally, for the first payment, the LIBOR rate applicable will be set at the trade date, if the value date is two days after the trade date. The first reset date will generally be two days before the first payment date, the second reset date will be two days before the second payment date and so on.

LIBOR: London Inter Bank Offered Rate, which is a rate decided on daily basis based on a sample of lending rates offered by leading banks in London.

Maturity Date: The date on which the interest accrual stops.

19.16.3 Pricing of Swaps

Since swap is an exchange of two streams of cash flows, it can be priced by determining the value of each stream of cash flows. The value of each stream of cash flows is the net present value of the cash flows in the stream. If the cash flows are in different currencies (as in currency swaps), the present values are converted to a single currency at the prevailing exchange rate. The price of the swap is the difference between the values of the two cash flows.

Valuation of Swap

Until now, we have seen how the parties in a swap benefit from the swap contract. In this section, we will describe how to value the swap. At the time of entering into the swap, both the parties will have the same value for all inflows and outflows, but after entering into the swap, the value may change due to changes in the interest rates. If the interest rates increase, the value of the fixed rate payer will decrease, and if the interest rate decreases, the value of fixed rate payer will increase. Depending on the value increase, if a party in the swap wants to realize the gain, it can reverse the existing swap with a new market swap.

Swaps can be valued on similar lines as bonds, as they essentially involve a series of cash flows at different points of time. First, we have to discount the inflows at an appropriate rate, and determine the present value. We repeat this process in the same way for outflows also. This difference between the value of inflows and outflows is nothing but the value of the swap. Generally, the prevailing LIBOR rate is used for discounting the cash flows of floating rate and market quoted swap rate is used for discounting those cash flows associated with fixed rate.

19.17 Interest Rate Swaps

Swaps transactions can be entered into for exchange of principal amount or for exchange of interest differential. In the former case, it is referred to as currency swap and in the latter case, it is called as interest rate swap.

Interest rate swaps are useful when companies want to move from one interest rate of structure to another interest rate structure

19.17.1 Definition

There are many types of swaps that have evolved over time. The most common among them are the interest rate swaps, currency swaps, and the cross currency interest rate swaps.

An interest rate swap is defined as an agreement between two or more parties who agree to exchange interest payments over a specific time period on agreed terms. The interest rates agreed may be fixed or floating. If there is an exchange of interest obligations, then it is termed a liability swap. If there is an exchange of interest income, then it is an asset swap.

The simple interest rate swaps are popularly called plain vanilla swaps. There are many variants of the plain vanilla swaps. These swap variants are the major innovations in the swap market, and are tailored to suit different needs of different customers.

19.17.2 Parties in a Swap Transaction

There are two parties to a swap transaction, fixed rate payer/receiver and floating rate receiver/payer. A fixed rate payer is the provider of floating rate funds. Hence, the purchasers of the swap lose when interest rate falls, and gain when interest rate rises. A floating rate payer is the provider of fixed rate funds. Hence, the seller of the swap loses when interest rate rises and gains when interest rate falls.

Let us take two examples to understand: There are two parties X and Y who are interested in raising funds. Firm Y can raise funds in fixed and floating markets at 10% and LIBOR + 0.25% respectively. Firm X can raise funds in fixed and floating markets at 10.75% and LIBOR + 0.50% respectively. These rates are applicable for a $100m borrowing for 2 years. While both X and Y can borrow in both fixed and floating market, firm X is interested in borrowing fixed interest rate, while firm Y is interested in borrowing in floating rates, shown below in Table 19.3.

Table 19.3

Firm	Objective	Fixed Interest	Floating Interest Rate
X	Fixed Rate	10.75%	LIBOR + 0.50%
Y	Floating Rate	10.00%	LIBOR + 0.25%

From the above table we can see that the cost of borrowing for Y is lower than that of X in both the markets. This difference is called quality spread, which can be quantified for both fixed and floating rate markets as below:

Fixed market	10.75% – 10.00% = 0.75%
Floating market	LIBOR + 0.50% – LIBOR 0.25% = 0.25%

The advantage enjoyed by Y is known as absolute advantage. Hence, we say that Y has an absolute advantage in fixed rate and floating rate markets. However, it can be observed that the cost of funds for X is higher in fixed rate market by 75bp, whereas the same is higher by 25bp in floating rate market. It means that X has a relative advantage in floating rate market. This advantage is known as comparative advantage. Hence, we can say that X has comparative advantage in floating rate market. Given their objectives, X should borrow in fixed rate market and Y should borrow in floating rate market. However, considering the comparative advantage enjoyed by X, it is possible to reduce the cost of funds to both X and Y, if they borrow in the markets where they enjoy comparative advantage, and then swap the borrowing. The reduction in the cost depends on the quality spread.

In this case, the amount of benefit that can be derived by both the parties will be the difference between the quality spreads which is 50bp (i.e., 0.75% – 0.25%). Assume that both the firms want to share the benefit equally between them.

Under the swap arrangement:

Y – borrows funds in fixed rate market and lends to X.

X – borrows funds in floating rate market and lends to Y.

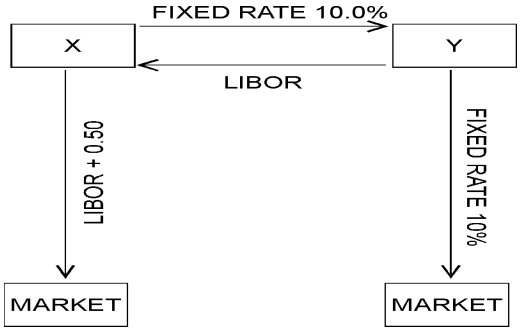
Let us assume that X lends to Y at LIBOR and Y lends to X at 10%.

The net cost of funds to X and Y using the swap arrangement can be seen by examining their cash flows. (Figure 19.3).

	Paid to Counterparty	Received from Counterparty	Paid to Market	Net Cost	Savings
Y	LIBOR	10%	10%	LIBOR	LIBOR + 0.25% Minus LIBOR
X	10%	LIBOR	LIBOR + 0.50	10.50%	10.75% Minus 10.50%

As seen from the above, funds are available to Y at LIBOR as against LIBOR + 0.25, and to X at 10.50 instead of 10.75%. Thus, swap enables reduction in cost of funds.

Figure 19.3: Swap Arrangement



Source: ICFAI Research Center

19.17.3 Interest Rate Swaps with Intermediary

An intermediary is often needed to bring together the counterparties in a swap agreement. In that case, part of the total benefit has to be shared with the swap intermediary. The total benefit from the above swap is 0.5%. If the intermediary charges a fee of say 0.1% and the net benefit of the swap is shared equally, each party will be able to lower its cost of funds by 0.2%. Banks, by virtue of their special position in the financial markets and knowledge of the diverse needs of clientele, are in a good position to fulfill this role.

19.17.4 Types of Interest Rate Swaps

Basis Swaps

A swap in which a stream of floating interest rates are exchanged for another stream of floating interest rates, is known as basis swap. Such type of swap is possible when,

- Both the floating interest-rate streams are based on the same structure, but with different instruments,
- The two interest-rate streams are calculated using same index, but with different tenor.

Forward Swaps

Forward swaps are those swaps in which the commencement date is set as a future date. Thus, it helps in locking the swap rates and use them later as and when needed. Forward swaps are also known as deferred swaps (different from deferred rate swaps) as the start date of the swap is delayed (deferred).

Deferred Rate Swaps

It is different from a forward rate swap, because it allows the fixed rate payer to enter into a swap at any time up to a specified future date. Thus, it works to the convenience of the fixed rate payer, and the payment can be deferred until a time when the rates are lower, so that he ends up paying less than what would have been paid, if paid at the rate on the commencement date.

Callable Swaps

A callable swap gives the holder, i.e., the fixed rate payer, the right to terminate the swap at any time before its maturity. Should the interest rates fall, the fixed rate payer exercises his right and terminates the swap since the funds will be available at a lower rate now. This right has a fee in terms of a higher fixed rate at the commencement of the agreement than what would be normally charged and calculated as a percentage of the swap's notional principal.

Putable Swaps

A putable swap allows the seller of the swap (the floating rate payer) to terminate the swap at any time before its maturity. If the interest rates rise, the floating rate payer will terminate the swap. The option premium in this case will be a higher

floating rate charged at the beginning of the swap. Sometimes, a termination fee is also charged, which is calculated as a percentage of the swap's notional principal.

Extendable Swaps

In an extendable swap, the fixed rate payer gets the right to extend the swap maturity date. If the interest rates rise and are expected to rise further, then such an extendable swap works to the advantage of the fixed rate payer, since he is required to pay less than the current rates.

Rate-Capped Swaps

An interest rate swap that incorporates the cap feature is called a rate-capped swap. If a floating rate payer anticipates a rise in interest rates, then he can purchase a cap at a fee payable upfront to the fixed rate payer so that the floating rate payable cannot exceed the capped rate. This gives more protection to the floating rate payer. He has to pay an upfront fee to the fixed rate payer.

Zero Coupon Swaps

In a zero coupon swap, the fixed rate payer makes a single fixed payment at the maturity of the swap from the proceeds of the bond repayment. It is a variation of the plain vanilla swap. The interest is calculated on a discount basis, while the floating rate payer makes periodic payments.

Amortizing Swaps

If the interest rates are fairly stable then the floating payments are also reduced over time. This swap is particularly useful, if a swap is undertaken to manage the risk arising from mortgage loans. Since the principal on a mortgage loan is amortized over the life of the loan, an amortizing swap is particularly useful for managing the associated interest rate risk.

Amortized Swaps

These swaps are the ones where the notional principal amount on which interest is paid decreases according to a pre-determined schedule, mostly based on a sinking fund. With a plain vanilla, the amount remains the same. A plain vanilla swap is suitable where loan interest is payable periodically, but the principle being borrowed is repaid in one lump-sum at the end of the period. It is a bullet repayment and the plain vanilla is sometimes called a bullet swap for this reason.

Accreting Swaps

Assume that there is an infrastructure project, the capital outlay of which is very high. Normally, loans on such projects will be given in installments and the interest payments are made on the increasing loan amounts. Typically, the loan is committed at the outset and the additional loans will be made available at a market rate (which will be changing every time). These floating rate payments can be converted into fixed rate payments through an accreting swap where the principal

amount increases every time additional loan is availed. It is same as amortized swap, except that the notional principal amount increases according to pre-determined schedule. Such a swap could be used by a bank which has agreed to lend increasing sums over a period of time to its customers, so that they may fund projects.

Roller-Coaster Swaps

In Interest Rate Swap (IRS) deal, interest rate risks can be shifted by converting a floating rate liability to a fixed rate liability, or vice versa. IRS can take different forms as they can be structured to meet each corporate's specific requirements. Ideally, to minimize the interest rate risk over the life-span of loan, a corporate should move from a floating to a fixed rate term at the bottom of an interest rate cycle, and do the opposite at its crest. It is a combined feature of both amortized swap and accreting swap, i.e., the notional principal increases and decreases during the life of the transaction, going up and down according to a schedule agreed at the time of the deal.

Example: Are Swaps Better Predictors of Interest Rate Hikes?

India's overnight indexed swaps (OIS), an instrument to hedge the interest rate risk of bonds, have been ahead of the bond market in signalling the May 4, 2022, policy rate hikes. OIS is considered a gauge for rates in the future. The one-year OIS surged 120 basis points (bps) and the five-year rate jumped about 60 bps as the Reserve Bank of India hiked its repo rate by 40 bps on May 4, 2022. As the Swap market was expecting a 100 basis points raise in the repo rate, by December 2022, the repo rate is expected to go up to 5.15% which was the pre-pandemic level. The OIS is indicating increases of up to 2 percentage points in the benchmark repo rate in the next two years, i.e., by May 2024.

Sources:(i)https://www.moneycontrol.com/news/business/markets/indias-swaps-are-ahead-of-bonds-in-anticipating-rate-hikes-8483541.html (Accessed May 20, 2022)

(ii) https://economictimes.indiatimes.com/markets/stocks/news/sharp-rate-hikes-may-not-be-just-an-option-in-future/articleshow/90901540.cms?from=mdr (Accessed May 20, 2022)

19.18 Options on Swaps

Options on swaps or swaptions can be written on any kind of swap. They can give the holder the option to enter into swaps at a certain date in future, on terms agreed at the time of purchase of the swaption. They ensure that the interest paid on a swap in future will not exceed a certain pre-decided level. Swaptions give a right but are not an obligation to the buyer to exercise his choice. Swaptions can be either American or European. European swaptions are more popular and can be exercised only on maturity, while the American ones can be exercised any time before maturity. Swaptions can be either Call Swaptions or Put Swaptions.

Example: Swaptions in Indian Market

After RBI started allowing lenders to offer swaptions which help to manage interest rate risks more effectively, in the Indian market, swaptions have begun to gain traction. On Aug 17, 2021, ICICI Bank has cut India's first set of 'swaption' deals with HSBC and Standard Chartered Bank, initiating a new era of risk management in the country's interest rate derivatives market. IndusInd Bank and Reliance Industries also started cutting 'swaption' deals, taking the notional value of transactions to ₹ 1,900 crore on the platform, in just 6 weeks.

Sources: (i) https://m.economictimes.com/markets/bonds/icici-bank-stanchart-hsbc-cut-deals-in-swaption-in-a-first/articleshow/85404411.cms (Accessed May 20, 2022)

(ii) https://economictimes.indiatimes.com/markets/bonds/swaption-deals-gather-pace-ril-icici-among-others-to-cut-deals/articleshow/86563213.cms?from=mdr (Accessed May 20, 2022)

19.18.1 Call Swaption

A call swaption gives its buyer the right to enter into a swap as a fixed rate payer. The writer of the call swaptions will be a floating rate payer if the option is exercised.

Assume that your firm wishes to enter into a fixed-floating rate swap because you expect the rates to rise and hence you want to pay a fixed rate and receive a floating rate. But there is a speculation that the rates may start falling after a certain period. Hence you may buy a call swaption so that depending on the rate movement in the future, you can enter into a swap deal or allow your option to expire.

19.18.2 Put Swaption

Here, the buyer gets the right to enter into a swap as a floating rate payer. The writer becomes the fixed rate payer when the option is exercised.

19.18.3 Other Types of Swaps

Commodity Swaps

In a commodity swap, the counter-parties make payments based on the price of a fixed amount of a certain commodity in which one party pays a fixed price for the goods, and the other party pays a market rate over the swap period. The first commodity swap took place in the Chase Manhattan Bank, in New York, in 1986.

In order to regularize the commodity swaps, the Commodity Futures Trade Commission (CFTC) has come out with the following rules and regulations:

i. No commodity swap can be terminated by one of the parties, without the consent of the other party.
ii. Contracts are to be entered into by the parties only for the commodities they deal.
iii. Only institutions and companies can indulge in commodity swaps. Individuals are not allowed to do so.

iv. No mark-to-market process with variation margins allowed.

v. No collateral or margin loans permitted for commodity swaps.

Assume that you are a wheat farmer producing 400 tonnes of wheat every year. You are not sure about the price of wheat for the next five years due to unpredictable nature of government policies that fix the price every year. You can avoid the risk arising from fluctuating nature of prices by using a swap where you receive a fixed price and pay a floating rate to the counterparty. Therefore, you are assured to receive a fixed amount every year for your commodity for the next five years.

Equity Swaps

An equity swap means an exchange of dividends earned and capital gains on a portfolio, which is based on a stock index against periodic interest payments.

It is similar to an interest rate swap, as it has a fixed period, a fixed rate payer and a floating rate payer.

Assume that you are managing a portfolio of stocks invested in an index fund. The underlying index is the S&P 500. You turn bearish following the recent movement in the stock prices, and you wish to hedge your position against any adverse movement in the future. So, you can use a swap where you pay the return on S&P 500, and receive a fixed payment in exchange. Both fixed rate receipt and floating rate payments are based on the notional principal i.e. your portfolio value. This is possible say, if you find another party which is interested in the S&P 500 investment and is ready to pay you the fixed interest returns on say, sterling pounds and sterling interest rates.

19.19 Currency Swaps

Currency swaps have evolved to facilitate companies to undertake global operations in different currency markets. Currency swaps enable such companies to protect against fluctuations in foreign currenciesA currency swap is a contract involving exchange of interest payments on a loan in one currency for fixed or floating interest payments on equivalent loan in a different currency. Currency swaps may or may not involve initial exchange of principal. A plain vanilla currency swap is a fixed-currency swap in which each party pays a fixed payment on the loan taken by them.

Currency swaps effectively decreased the use of these loans due to the following advantages:

i. In currency swaps, if one party defaults the other party can terminate the contract and still claim for the damages.

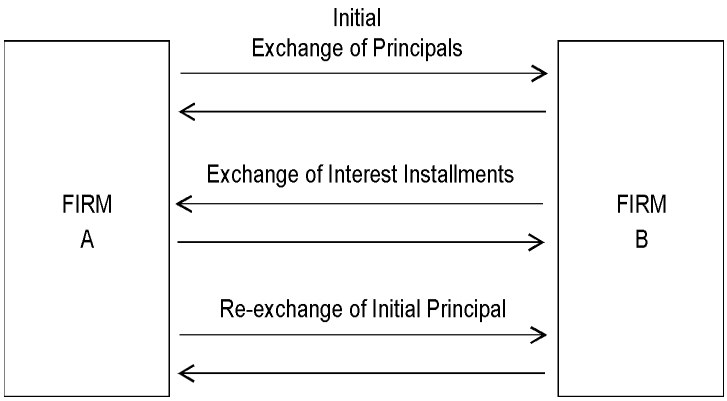
ii. As the currency swap is not a loan, it does not appear as a liability on the contracted party balance sheet unlike parallel loans.

iii. Currency swaps have high liquidity. Due to this, banks themselves are ready to take risk in swap transaction.

In the back-to-back and parallel loans (which are still in practice), the documentation is cumbersome and counterparties have to find others with mirror currency requirement. Changes in interest rates and foreign exchange rates during the life of the structures also cause difficulties. Currency swaps do not involve foreign currency loans like their predecessors. Instead, in a typical currency swap, one party agrees to make periodic payments, based on either fixed or floating interest rates, to a counter-party, who in turn makes periodic payments to the other in a different currency. The payments are based on principal amounts which are fixed at the initiation of the swap. Unlike interest swaps, where no exchange of principal takes place, in a currency swap the principal amount is generally exchanged at the beginning of the transaction, and re-exchanged upon maturity.

The following Figure 19.4 shows the mechanics of currency swaps:

Figure 19.4: Currency Swaps



Source: ICFAI Research Center

19.19.1 Basic Steps in Currency Swaps

Currency swaps involve three steps, although the first may be notional.

The steps are:

Step 1 : Initial exchange of principal

Step 2 : Exchange of interest rate

Step 3 : Re-exchange of the initial principal at the end of the contract.

A currency swap need not involve an initial exchange of principal, if the parties involved are concerned about only periodic requirements of different currencies. In such a situation, the principal involved will be notional and only periodic interest payments will be exchanged between the two parties concerned. Similar to interest rate swaps, in cross currency interest rate swaps, the interest payments are netted. These payments are determined by the prevailing exchange rates on the payment date.

Fixed to Fixed Currency Swap (Non-amortizing)

The counter-parties to a fixed to fixed-currency swap may wish to enter the swap because of comparative advantage, the same kind of motivation as with interest rate swaps. The comparative advantage may be in either direction.

19.19.2 Other Types of Currency Swaps

The other types of currency swaps are-

Fixed to Floating Currency Swaps (Non-amortizing)

As in a currency swap, the parties exchange principal at the outset of the swap, but one party pays a fixed rate of interest on the foreign currency it receives. The other party pays a floating rate of interest rate on the foreign currency it receives. It is a plain vanilla currency swap. At the swap's maturity, there is a re-exchange of principal amounts. Interest payments are periodically exchanged during the life of the transaction.

Fixed to Fixed Currency Swaps (Non-amortizing)

It is identical to the fixed for floating currency swap, except that instead of a fixed and a floating rate of interest, both parties pay fixed rate of interest. This can be done by having a single agreement or two agreements for swapping.

Circus Swaps

Here, two fixed-floating currency swaps are combined to form a fixed to fixed-currency swap which is also called a circus swap. It can be created by combining a currency swap and an interest rate swap too, with floating rate or both having LIBOR-based pricing.

Activity 19.3
How are swaps traded? State the nature and basic terms of swap contracts. What inference would you make for a swap quote of LIBOR/five year swap at 70/90 over five year treasury by bank?
Answer:

Check Your Progress - 2

6. _____ is an obligation to deliver the contract at settlement with an amount equal to 'x' times the difference between the stock index value on the expiration contract date and the price at which the contract is originally struck.

   a. Futures on individual stock

b. Index future

c. Commodity futures

d. Currency futures

e. Interest rate futures

7. Which of the following notations is used to refer to the volatility of stock price that increases the value of both call and put options?

a. S

b. t

c. r

d. e

e. σ

8. _____ is a strategy that involves the investor in buying the underlying asset and buying a put on that asset.

a. Straddles

b. Strangles

c. Protective put

d. Covered call writing

e. Spreads

9. Identify the option that is useful for hedging a future event that has a high level of uncertainty in occurrence enabling the option holder to make an option a call or a put after a specified period of time.

a. Binary option

b. Bermudan option

c. Choose option

d. Compound option

e. Rainbow option

10. _____ give the holder the right to terminate the swaps at any time before its maturity.

a. Forwards swaps

b. Callable swaps

c. Extendible swaps

d. Putable swaps

e. Amortized swaps

19.20 Summary

- Risk is the situation when there are a number of specific, probable outcomes, but it is not certain as to which one of them will actually happen.

- The various risks faced by a firm are interest rate risk, exchange risk, default risk, liquidity risk, business risk, financial risk, market risk, and marketability risk.
- Corporate risk management refers to the process of a company attempting to manage its risks at an acceptable level. It is a scientific approach to deal with various kinds of risks faced by a corporate.
- Risk management needs to be looked at as an organizational approach, as management of risks independently cannot have the desired effect over long-term. This is especially necessary as risks result from various activities in the firm, and the personnel responsible for the activities do not always understand the risk attached to them.
- Risk Management is process involving sequential steps which are determining objectives, identifying risks, risk evaluation, development of policy, development of strategy, implementation and review.
- A futures contract can be defined as an agreement to buy or sell a standard quantity of a specific commodity at a predetermined future date and at a price agreed between the parties through open outcry, on the floor of an organized futures exchange.
- Options and Futures are referred to as 'Derivatives', which are the result of unrelenting search for better financial instruments. They derive their value from an underlying commodity or a financial asset.
- Today Futures and Options are traded on commodities and financial assets such as foreign exchange, bank time deposits, U.S. Treasury Securities, Stock indexes, petroleum products, and metals. It should be remembered that there are blue chip stocks and options on blue chip stocks.
- Options which are more complicated than the standard European or American options are referred to as exotic options. Most of them are traded in the over-the-counter market, and are designed by financial institutions to meet the specific requirements of the clients.
- Options pricing models determine the options' prices uniquely without any arbitrage possibility. These models are Binomial Option Pricing Model and Black Scholes Pricing Model.
- Financial swaps are private contractual agreements between two parties, to exchange cash flows in the future, according to specified terms and conditions. If a swap transaction involves exchange of interest payments, then it is known as an interest rate swap.
- Swaps are seldom exchange traded and carry some residual risks to the intermediary.

- There are many types of swaps that have evolved over time. The most common among them are the interest rate swaps, currency swaps, and the cross currency interest rate swaps.
- An interest rate swap is defined as an agreement between two or more parties who agree to exchange interest payments over a specific time period on agreed terms.
- A currency swap is a contract involving exchange of interest payments on a loan in one currency for fixed or floating interest payments on equivalent loan in a different currency. Currency swaps may or may not involve initial exchange of principal.
- Options on swaps or swaptions can be written on any kind of swap. They can give the holder the option to enter into swaps at a certain date in future, on terms agreed at the time of purchase of the swaption.

19.21 Glossary

At-the-Money: An option whose exercise price is equal to the current spot price is said to be at-the-money.

Basis Points (BP): Basis point is 1/100th of 1% i.e. 10 basis points = 0.1%.

Call Option is one where the writer gives the buyer of the option, the right to purchase the underlying asset from him.

Currency Swaps involves the terms of agreement that provide for exchange of principal, which normally happens when two currencies are involved.

Expiration Date is the date on or before which the option should be exercised. If not exercised on or before the date, the option lapses and cannot be exercised thereafter.

Interest Rate Swap refers to exchange of interest payments without involving exchange of principal payments.

In-the-Money: A call option is 'In the Money', if the market price at the time of exercise is greater than the exercise price. The reverse applies to a put option.

London Inter Bank Offered Rate (LIBOR) is a rate decided on daily basis based on a sample of lending rates offered by leading banks in London.

Maturity Date is the date on which the interest accrual stops.

Notional Principal is the principal amount on which the interest calculation is made.

Options Series: All options of a type are referred to as belonging to the same class of options. For example, put options are a class.

Out-of-the-Money: A call option goes out of the money if the market price is less than the exercise price, as the holder will be better off buying the asset from the market. Again, the reverse applies to a put option.

Put Option is one where the writer gives the buyer of the option, the right to sell the underlying asset.

Straddle involves a call and a put option with the same exercise price and the same expiration date

Strangle is a combination of a call and a put option with the same expiration date and different strike prices

Straps consists of a long position in two calls and one put with the same strike price and expiration date.

Strike Price is the price at which the holder of the option can buy (or sell) the asset on which the option was written. The option can be exercised only at the strike price, irrespective of the price of the asset in the market, at the time of exercise.

Strips consists of a long position in one call and two puts with the same exercise price and expiration date.

Swap Coupon is the fixed rate of interest on the swap.

Swap is an agreement between two parties to exchange a series of payments, the terms of which are predetermined.

19.22 Self-Assessment Test

1. How are risks classified? Briefly explain the techniques in risk management.
2. Distinguish between future and forward contracts.
3. Explain in detail the mechanics of future market.
4. Illustrate the hedging route mechanism in forecasting the future prices.
5. Elucidate the characteristics of different types of future contracts.
6. What are options? Explain the factors influencing the option prices.
7. 'Options trading strategies would help the trader to profit from the unexpected movement of prices of the underlying asset in either directions.'- Comment.
8. Enumerate on the bases and assumptions of Black and Scholes Model for pricing options.
9. What are Interest Rate swaps? Discuss in detail the types of interest rate swaps.
10. Explain the types and steps involved in currency swaps.

19.23 Suggested Readings / Reference Material

1. Brealey Myers (2020). Principles of Corporate Finance, 13th edition, USA: McGraw-Hill Companies Inc.

2. Prasanna Chandra (2019). Financial Management – Theory and Practice, 10th edition, New Delhi: Tata McGraw-Hill.
3. I.M. Pandey (2021). Financial Management, 12th edition, New Delhi: Pearson Education.
4. Francis Cherunilam (2020). International Business — Text and Cases, 6th Edition, PHI Learning.
5. P.G. Apte (2020). International Financial Management, 8th Edition, McGraw Hill Education (India) Private Limited.
6. John Tennent (2018). The Economist Guide to Financial Management. Economist Books.

19.24 Answers to Check Your Progress Questions

1. (b) Exchange risk

Exchange risk is the risk of the possibility of adverse effect on the value of a firm's assets, liabilities or income, as a result of exchange rate movements. Adverse movements in exchange rate can affect a firm's profits, assets or liabilities, even if it is not operating in foreign markets.

2. (c) Market risk

Market risk is the risk that arises when the value of a firm's investments go down as a result of market movements. It is also referred to as price risk.

3. (e) Loss Control

Loss control refers to the attempt to reduce either the possibility of a loss or the quantum of loss. This is done by making adjustments in the day-to-day business activities.

4. (b) Review

A periodic review ensures that the risk management function remains flexible, and the tools, techniques, and instruments used for managing risk change according to the changing circumstances.

5. (c) Broker

Brokers on a futures exchange open accounts for their clients, maintain account balances, and report all the trading activity undertaken by their clients. These brokers, who are akin to brokers on the stock exchange, execute the deals on the futures exchange for their clients.

6. (b) Index future

Index futures are one of the most popular types of futures as far as trading is concerned. An index futures contract is basically an obligation to deliver at settlement, an amount equal to 'x' times the difference between the stock index value on the expiration date of the contract and the price at which the contract was originally struck.

7. (e) σ

Volatility of stock price (σ) increases the value of both call and put options. This is because -- the possible loss being limited to the premium paid -- the possibility of profit varies directly with the anticipated volatility of the stock price.

8. (c) Protective put

This strategy involves buying the underlying asset and buying a put on that asset. This strategy appeals to those investors who are particularly concerned with protection against downside fluctuations in stock prices.

9. (c) Choose option

A chooser option is one in which the option holder has a choice to make an option a call or a put, after a specified period of time. These are also called as-you-like-it options.

10. (b) Callable swaps

A callable swap gives the holder, i.e., the fixed rate payer, the right to terminate the swap at any time before its maturity. Should the interest rates fall, the fixed rate payer exercises his right and terminates the swap, since the funds will be available at a lower rate.

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