

# International Financial Management

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Edited by:  
Dr. Nitin Gupta



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# **International Financial Management**

**Edited By  
Dr. Nitin Gupta**

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Summary

Keywords:

Self Assessment

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Review Questions

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**Objective**

After studying this unit, you should be able

- understand the meaning of financial management and international financial management.
- differentiate between domestic and international finance.
- understand meaning and significance of currency crises.
- assess global recession and risk spill over in International market.

**Introduction**

Globalisation has reduced the whole world to a small village. It is increased interdependence of world's economies which is due to cross broader trade in goods, services, technologies and flows - of investments, people and information. The driving forces of Globalisation are deregulation and advances in information technologies. All these have greatly reduced information and transaction cost, which has led to Financial Innovations, such as currency futures and options, multi-currency bonds, cross-border stock listings, International mutual funds.

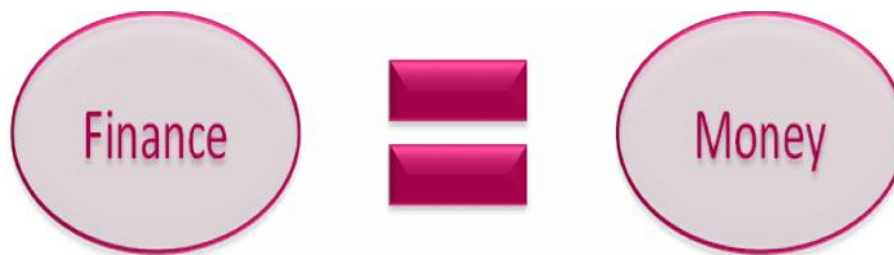
So International trade offers finance manager numerous opportunities and risk. Knowledge of International financial management will lead financial manager to take advantage of opportunities and also hedge the various risk associated with International trade.

Let us understand the word finance, financial management and International financial management.

**1.1 Meaning of Finance**

Finance is the life blood of business. You cannot start business nor grow business without finance. Not only business but in personal life also you cannot move without finance.

In simple words finance is perceived equal to money.



After understanding meaning of finance let us also see the what is financial management. Financial Management in simple words is the management of money or “funds” management. It is a managerial activity that is concerned with the management of financial resources. That is, it covers all decisions having monetary implications.

## **1.2 Definition of Financial Management**

“Financial Management is the operational activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operation.” Joseph Massie

“Financial Management is an area of financial decision making, harmonizing individual motives and enterprise goals.” Weston Brigham

Analyzing definition the finance manager has to take following decisions to run business efficiently:

- **Financing decision:** It is mainly concerned with identifying suitable source of funds and how to tap these sources for business. The main emphasis of finance decision is how to reduce cost of finance.
- **Investment decision:** It is mainly concerned with identifying productive avenue to get maximum return on investment. Investment decisions are important for firm in long term survival and growth.
- **Dividend decision:** This decision of finance manager is concerned with how much profit is to be distributed to shareholder and how much is to be reinvested back in the business.
- **Working Capital Decision:** This decision of finance manager is concerned with day to day requirement of working capital. Working capital should be adequate for smooth conduct of business. If working capital is surplus it means funds are not properly utilised and if working capital is deficient it will affect business adversely. So finance manager has to see that working capital is neither surplus nor deficient so that business can run efficiently.



So we can conclude from the above that these functions are to be performed by every finance manager so that business can be conducted smoothly.

### 1.3 International Financial Management

International finance is the branch of financial economics broadly concerned with monetary and macroeconomic interrelations between two or more countries. International Financial Management refers to the management of the finance function of an overseas business or international business. Here, international business means carrying of business activities beyond national boundaries.

#### Domestic versus International Finance

1. Foreign Exchange Risk:- Foreign Exchange Risk is the risk that foreign currency profits may evaporate in home currency terms due to unanticipated unfavorable exchange rate movements.



**Example:** The decrease of the Indian rupee against the US dollar will affect the revenue.

2. Political Risk:- Sovereign governments have the right to regulate the movement of goods, capital, and people across their borders. These laws sometimes change in unexpected ways.



**Example:** In 1992, Enron Development Corporation signed a contract to build India's longest power plant. Unfortunately, the project got cancelled in 1995 by the politicians in Maharashtra who argued that India did not require the power plant. The company had spent nearly \$300 million on the project. This contract signifies how political risk in international operations impact the business and are more complicated than the domestic operations of business..

3. Market Imperfections: - Legal constraints on the movement of goods, people, and money, such as transaction costs, shipping costs, and tax arbitrage.
4. Expanded Opportunity Set: - It doesn't make sense to play in only one market. It is true for corporations as well as individual investors.

Investor's perspective: -Risk reduction through international diversification.

Corporation's perspective: - Access to cheaper production inputs and Access to consumers and capital.

The firm in international business may able to raise funds at lower cost than the firm which is doing business only at domestic level and also able to get benefit of economies of scale.



Notes: Knowledge of international finance is very crucial for MNCs as it enables the companies and financial managers to take appropriate steps to hedge against from adverse movements in exchange rates, interest rates and inflation rates.

The inflow of foreign investment in the form of-

Foreign Direct Investments are investments made for controlling property assets or companies located in host countries.

Foreign Portfolio Investments are purchases of foreign financial assets for a purpose other than control.

FDI is important for the economic development of a country. It increases employment opportunities, enhanced productivity, higher wages and increased productivity. FPI is a passive investment done in stock, ADR and GDR where investor have no control over ventures or direct ownership.



Did you know?

The value of FDI reached in India reached to record high of \$505 billion in 2020-21.

In 2020-21 FPI pumped in a record \$37 billion or Rs 2.75 lakh crore into the equity the highest in two decade.

## **1.4 Financial Integration**

Financial Integration is the situation in which financial markets of domestic and global economies are linked together. It is the way of unifying the markets so that similar assets get similar risk adjusted return across the markets.

### **History of Financial Integration:**

Financial integration is believed to date back to the 1690s and was briefly interrupted at the start of the French Revolution. At the end of the 17th century, the world's dominant commercial empire was the Dutch Republic with the most important financial center located in Amsterdam.

The Amsterdam Exchange was place in the world market where different types of securities and commodities were traded. It was also in this period that London and Amsterdam were closely integrated financially.

However, it was in the Classical Gold Standard Era that financial integration began to take shape in Europe.

Finally the year of 1980s and 1990s saw a significant increase in financial integration. The driving force behind this was a sharp increase in real exchange rate volatility and the increased risk which compelled all stakeholders to worked together to address these challenges.

Regulatory restrictions on international capital mobility were removed because such a regulatory framework was too costly in the new market environment.

### **Driving forces for financial market integration:**

The major reasons for Integration of financial markets all over the world are-





Deregulation of financial markets with world market are more connected due to enhancement of information technology led to innovation of new products as per the need of market to increase profit and reduce risk.

### Forms of financial market integration:

The various which signify financial integration include:

- Information sharing
- Sharing of cutting-edge technologies (through licensing)
- Borrowing and raising funds directly in the international capital markets
- Investors directly invest in the international capital markets
- Various forms of actual financial integration include:
- Cross-border capital flows
- Foreign participation in the domestic financial markets.

### Imperfection-financial market integration:

One of the important characteristics in financial market is that they are imperfect. Due to this reason financial integration in neighboring, regional and/or global economies is therefore imperfect.

Imperfect financial integration can arise from the inequality of the marginal rate of substitution of different agents. In addition to this, legal restrictions are also one of the reasons for hindering financial integration.

Therefore, financial integration can also be achieved through the elimination of restrictions pertaining to cross-border financial operations.

Financial integration can take place through a formal international treaty in which the governing bodies of these economies agree to cooperate to address financial disturbances through regulatory and policy responses.

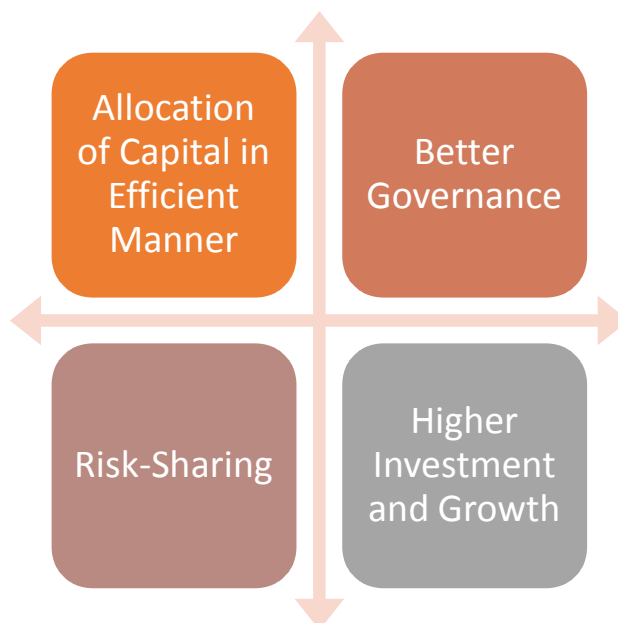
### Measuring financial market integration:

One way how financial integration is measured includes gross capital flows, stocks of foreign assets and liabilities, degree of co-movement of stock returns, degree of dispersion of worldwide real interest rates, and financial openness.

One view to give more emphasis on the bilateral capital flows, rather than gross capital flows to determine a country's financial integration, ignoring capital surplus and capital deficit amounts. For instance, a country with only capital inflow and no capital outflow will be considered as not financially integrated.

### Benefits and disadvantages of financial integration:

Major benefits of financial integration include



Financial integration can also have adverse effects. For example, a higher degree of financial integration can generate severe financial contagion in neighboring, regional and/or global economies.

With rapid capital flows around the world, the currency and financial crises in the late 1980s and 1990s were inevitable. Consequently, developing countries that welcomed excessive capital flows were more vulnerable to these financial disturbances.

However financial Integration is necessary for reforming the international financial system.

## 1.5 Financial and Currency Crises-Meaning

### Meaning of Financial and Currency Crises:

A financial crisis is broad situations in which some financial assets suddenly lose a large part of their nominal value.

In the 19th and early 20th centuries, many financial crises were associated with banking panics, and many recessions coincided with these panics. Other situations that are often called financial crises include stock market crashes, the bursting of other financial bubbles, currency crises, and sovereign defaults.

A currency crisis involves the sudden and steep decline in the value of a nation's currency, which causes negative ripple effects throughout the economy.

A currency crisis is a situation where doubt exists that a country's central bank has sufficient foreign exchange reserves to maintain the country's fixed exchange rate. The crisis is often accompanied by a speculative attack in the foreign exchange market.

### *Example of Currency Crisis – Turkey 2018*

Turkey is one of the largest emerging market economies in the world.

In the 2000s, the Turkish government implemented couple of political and economic reforms to attract foreign investment.

After the 2008-2009 global crises, Turkey experienced a rapid inflow of foreign capital which was partly due to the reforms and partly due to most large countries lowered interest rates after the crisis to promote investment and boost aggregate demand.

In 2018, the Turkish lira (TRY) fell by almost 45% against the US dollar (USD). During the period from 2010 to 2018, Turkish businesses and banks borrowed huge amounts of money from international investors.

## Unit 01: Introduction to International Financial management

Most of the debt was dollar-denominated, which meant that Turkey was exceptionally susceptible to US monetary policy.

The crisis started when the US Federal reserve raised interest rates in the first half of 2018. The policy change increased the total debt payments that Turkish firms and banks needed to make. In addition, global investors started losing faith in Turkish ability to sustain the construction boom that previously allowed Turkey to grow so quickly. All of these factors contributed to a drastic drop in the demand for the Turkish lira in foreign exchange markets.

The decline in demand increased the downward pressure faced by the lira and led to further decreases in the TRY/USD. The decreased exchange rate further raised the nominal value of USD-denominated debt owed by Turkish banks and companies. Thus, a sort of vicious circle arose, which gave rise to a currency crisis.

### **Currency Crisis-Significance:**

A currency crisis is a type of financial crisis and is often associated with a real economic crisis. A currency crisis raises the probability of a banking crisis or a default crisis. During a currency crisis, the value of foreign denominated debt will rise drastically relative to the declining value of the home currency.

Central banks and governments can intervene to help stabilize a currency by selling off reserves of foreign currency or gold, or by intervening in the forex markets.

Impact of Currency Crisis



### **1.6 Global Recession and Risk Spill Over**

With financial globalization, the world has become a global village, where assets can be traded in any part of the world in no time and without restrictions. Such a high interdependence of economies has increased the effects of one economy to other part of world..

In the field of finance, the terms spillover, contagion, co-movement and cointegration are commonly used interchangeably.

Spillover effect refers to the impact that seemingly unrelated events in one nation can have on the economies of other nations. Although there are positive spillover effects, but the term is mostly used in a negativesense impact on domestic environment due to international reason such as an earthquake, stock market crisis, or another macro event.

Spillover effects are a type of network effect that has increased since globalization in trade and stock markets deepened the financial connections between economies.



Example: If consumer spending in the United States declines, it has spillover effects on the economies that depend on the U.S. as their largest export market. The larger an economy is, the more spillover effects it is likely to produce across the global economy.

The U.S. is a leader in the global economy, nations and markets can be easily swayed by domestic turmoil. Since 2009, China has emerged as a major source of spillover effects as well. This is because Chinese manufacturers have driven much of the global commodity demand growth since 2000. With China becoming the number two economy in the world after the U.S., the number of countries that experience spillover effects from a Chinese slowdown is significant.

## Special Considerations

### Unconnected Economies

There are some countries that experience very little as far as spillover effects from the global market. These closed-off economies are getting rarer as even North Korea –an economy nearly sealed off from world trade in 2019–has begun to feel the spillover effects from intermittent Chinese slowdowns.

### Safe-Haven Economies

A few developed economies are vulnerable to certain economic phenomena that can overwhelm spillover effects, no matter how strong. Japan, the U.S., and the Eurozone, for example, all experience spillover effects from China, but this impact is partially counteracted by the flight to safety by investors into their respective markets when global markets get shaky.

The spillover effect is when an event in a country has a ripple effect on the economy of another, usually more dependent country.

Some countries experience a cushion from the spillover effect because they are considered "safe haven" economies, where investors park assets when downturns occur.

## Summary

International Financial Management is management of funds in international business or business across national boundaries. Through International financial management finance manager able to harness the opportunities to increase sales and profit for the organization as in today's global environment it doesn't make sense to do business only at one place.

With opportunities finance manager also learns how to tackle the risk in international business and how to hedge these risks. Finance manager have to take following decisions like finance, investment, dividend and working capital decision to run business smoothly.

Financial Integration is an important aspect in today's globalized environment. The driving forces behind financial integrations are globalization, deregulation and advancement in information technology.

Some of the benefits of integrations are efficient capital allocation, better governance, higher investment and growth, and risk-sharing. At the same time it also has adverse effects like a higher degree of financial integration can generate severe financial contagion in neighboring, regional and/or global economies.

As the economies became interdependent it also has spillover effect in which impact of one economy is felt on other economy. Financial crises are the crises in which financial assets suddenly lose a large part of their nominal value. A currency crisis involves steep decline in the value of a nation's currency, which causes negative ripple effects throughout the economy.s

## Keywords:

**Globalisation:** Globalisation is a situation which involves increased interdependence of world's economies which is due to cross broader trade in goods, services, technologies and flows -of investments, people and information.

**Financial Management:** It is a managerial activity that is concerned with the management of financial resources.

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**International Financial Management:** It is a managerial activity that is concerned with the financial resources of funds of overseas business.

**Financial Integration:** It is the situation in which financial markets of domestic and global economies are linked together.

**Financial crisis:** It is a situation in which some financial assets suddenly lose a large part of their nominal value.

**Spillover:** Spillover effect refers to the impact that seemingly unrelated events in one nation can have on the economies of other nations.

### Self Assessment

1. The basic principles of financial management -----of funds and their effective -----,

- A. Raising, Utilization
- B. Raising, dividend
- C. Income, Expense
- D. None

2. Special about "International" Finance

- A. Foreign Exchange Risk
- B. Political Risk
- C. Market Imperfections
- D. All of the above

3. Goals for International Financial Management is-----

- A. Maximization of shareholder wealth
- B. Maximization of shareholder profit
- C. Both
- D. None

4. Finance decisions are concerned with

- A. Procurement
- B. Selecting Avenue For Maximizing ROI
- C. Distributing Profit
- D. Investment in Current

5. Investment decisions are concerned with

- A. Procurement
- B. Selecting Avenue for Maximizing ROI
- C. Distributing Profit
- D. Investment in Current Assets

6. Dividend decisions are concerned with

- A. Procurement
- B. Selecting Avenue for Maximizing ROI

- C. Distributing Profit
  - D. Investment in Current Assets
7. Working capital decisions are concerned with
- A. Procurement
  - B. Selecting Avenue For Maximizing ROI
  - C. Distributing Profit
  - D. Investment in Current Assets
8. A higher degree of financial integration can generate ----- financial contagion in neighboring, regional and/or global economies.
- A. Higher
  - B. Lower
  - C. Equal
  - D. Not Applicable
9. A currency crisis involves the sudden and steep ----- in the value of a nation's currency, which causes negative ripple effects throughout the economy.
- A. Increase
  - B. Decline
  - C. Equal
  - D. Not Applicable
10. A currency crisis -----the probability of a banking crisis or a default crisis.
- A. Raises
  - B. Decreases
  - C. Equal
  - D. Not Applicable
11. Social and economic costs of currency crises are manifested in terms of-----inflation and unemployment,
- A. Higher
  - B. Lower
  - C. Equal
  - D. Not Applicable
12. A dividend decision is also referred to as capital budgeting decisions.
- A. True
  - B. False
13. An advance in information technology is one driving force for financial Integration.
- A. True
  - B. False

Unit 01: Introduction to International Financial management

14. Benefits of financial integration include efficient capital allocation, better governance, higher investment and growth, and risk-sharing.

- A. True
- B. False

15. A currency crisis involves the sudden and steep decline in the value of a nation's currency, which causes negative ripple effects throughout the economy.

- A. True
- B. False

### Answers for Self Assessment

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. D  | 3. A  | 4. A  | 5. B  |
| 6. C  | 7. D  | 8. A  | 9. B  | 10. A |
| 11. A | 12. B | 13. A | 14. A | 15. A |

### Review Questions

1. What do you mean by International Financial Management?
2. What are the various functions which finance manager has to perform in the organization?
3. Company X desires to penetrate a foreign market with either a licensing agreement or by acquiring a foreign firm. Explain Company X the distinguishing features of international finance.
4. What is financial market integration? Elaborate benefits and disadvantages of financial integration.
5. Analyze the impact of Global recession and risk spill over on the economies.



### Further Readings

Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.



### Web Links

[https://en.wikipedia.org/wiki/International\\_financial\\_management](https://en.wikipedia.org/wiki/International_financial_management)

<https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/77579.pdf>

<https://corporatefinanceinstitute.com/resources/knowledge/economics/currency-crisis/>

<https://www.investopedia.com/terms/s/spillover-effect.asp>

**Unit 02: Balance of Payments and International Monetary System****CONTENTS**

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2.1 Balance of Payments:

2.2 Structure Contents of Current, Capital, and Reserve Accounts-Current account:

2.3 Difference between Balance of Trade and Balance of Payment

2.4 Balance of Payments Disequilibrium

2.5 Methods of Correcting Disequilibrium in BOP

2.6 International Monetary System

2.7 Stages in International Monetary System

2.8 The Smithsonian Agreement

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

**Objective**

After studying this unit, you should be able

- understand balance of payment and its significance
- analyze bop disequilibrium factors and measure for disequilibrium
- understand features and implications of International Monetary system
- asses Implications of Current Exchange Regime

**Introduction**

Balance of Payment and International monetary system are the critical aspects of International business, which impact the business in terms of increasing revenue and hedging techniques to be employed by organization.

Every business relies on stable mechanism by which it can exchange currencies between countries and monetary system plays a significant role.

Let us understand Balance of payment first-

**2.1 Balance of Payments:**

The Balance of Payments is **“a systematic record of all economic transactions between the residents of the reporting country and the residents of foreign countries during a given period of time.”**

From the definition following can be analyzed-

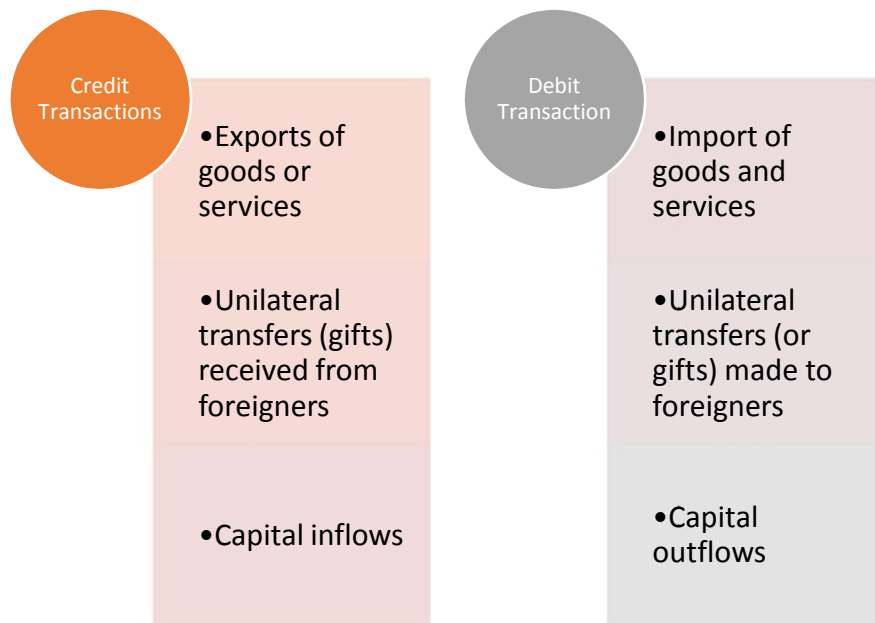


International Financial management

- It is a statement of all economic transactions between the residents of the reporting country and rest of world.
- It involves economic transaction which involves a receipt and a payment of money in exchange for economic goods and services.
- It is a record related to a period of time.
- It includes all transactions, current as well as capital.

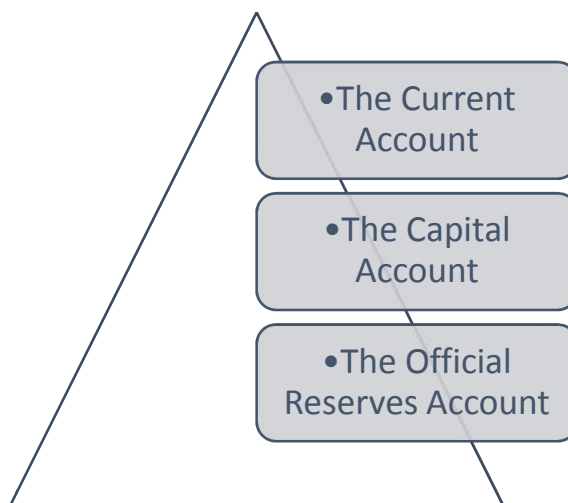
Balance of Payment is a record so BOP accounting is also important. It is like sources and uses of funds statement that reflects changes in assets, liabilities and net worth during a specified period of time. It is nor income statement nor balance sheet. There can be two situations in terms of actual receipts and payments, a country may be facing which are either a surplus balances or deficit balance.

The BOP's accounting principles regarding debits and credits can be summarized as follows.



**2.2 Structure Contents of Current, Capital, and Reserve Accounts-**  
**Current account:**

The Balance of Payment of a country is classified into three well-defined categories -



## Unit 02: Balance of Payments and International Monetary System

1. The current account shows the countries transaction with the world of net trade of goods and services and international transfers of capital over a period of time. The Current account shows the net balance arises from-

- merchandise trade,
- service trade,
- unilateral transfers
- investment income

The rules for recording a transaction as debit and credit in the current account are

	Debit(outflow)	Credit(inflow)
Goods	Buy	Sell
Services	Buy	Sell
investment income	Pay	Receive
unilateral transfers	Give	Receive

2. The Capital account in the BOP records all movement of capital from both private sources as well as official government sources between a country and others. It may consist of transfer of ownership of a fixed asset; direct investments, portfolio investments, other investments and reserve assets.

That is the Capital account include-

- Direct investment occurs when the investor acquires equity such as purchases of stocks, the acquisition of entire firms, or the establishment of new subsidiaries. This is generally taken to take advantage of market imperfection and when expected return exceeds expectation.
- Portfolio investments represent sales and purchases of foreign financial assets such as stocks and bonds that do not involve a transfer of management control. This is generally undertaken to safety, liquidity and diversification of risk.
- Capital flows represent the third category of capital account and represent claims with a maturity of less than one year. Change in interest rate and exchange rate impacts these claims. Such claims includes bank deposits, short term loans and money market instruments less than a year

3. The Official Reserve Account are government owned assets. The official reserve account represents only purchases and sales by the central bank of the country.

### **2.3 Difference between Balance of Trade and Balance of Payment**

Balance of Trade summarizes export and import of goods of a country with the remaining world.

Balance of Payment is a statement that shows all economic transactions done by the country with the remaining world.

The balance is favorable when credit exceeds debits and unfavorable when debits exceeds credits.

## 2.4 Balance of Payments Disequilibrium

The reasons of balance of payment disequilibrium are:

### Economic factors

- **Development Disequilibrium:** When the country is in development stage with large scale development expenditure giving rise to increased demand and prices. High demand leads to more imports than exports giving rise to adverse balance of trade and payments.
- **Capital Disequilibrium:** This is due to cyclical fluctuations in general business activity. If domestic economy experiences a boom, while the rest of the world not so. This will lead to more demand causing greater imports than exports because of slackness in world economy.
- **Secular Disequilibrium:** If long term balance of payment problem remains, then it is due to some long term trends in the economy. If domestically there is persistent high demand and high domestic prices then imports will always be more than exports causing adverse balance of payment.
- **Structural Disequilibrium:** This is due to effects on exports & imports because of development of alternative sources of supply, discovery of better substitutes, exhaustion of productive resources, changes in transport routes and costs etc.

### Political factors

When country faces continuous political instability and wars like situation, leads to capital outflows and less domestic investment and production. This will lead to balance of payment problems.

### Social factors

Changes in tastes, preferences, fashions will affect the exports and imports. This will lead to balance of payment problems.

## 2.5 Methods of Correcting Disequilibrium in BOP

The methods of imbalance in balance of payment are divided into two categories:

Monetary Measures for Correcting the BoP

Non-Monetary Measures for Correcting the BoP

### Monetary Measures for Correcting the Balance of Payment:

- **Deflation:** Deflation is a situation that leads to fall in prices. It has been used as a measure to correct deficit in balance of payment. A country faces deficit when its imports exceeds exports. The various measures used for deflation by a country like bank rate policy, open market operations, or through fiscal measures like higher taxation, reduction in public expenditure, etc.

Deflation will make domestic goods cheaper in foreign markets which give a rise in exports. It will also impact the fall in demand due to higher taxation and reduced income. This would result in favorable position in the balance of payment.

## Unit 02: Balance of Payments and International Monetary System

- **Contraction in Money Supply:** Contraction in money supply in the economy will reduce purchasing power reducing demand. This will lead to less imports thereby correcting balance of payments.
- **Exchange Depreciation:** Exchange depreciation means decline in the rate of exchange of domestic currency in terms of foreign currency.



Example: Let us suppose the exchange rate between Indian rupee and US dollar is \$1 = Rs. 50. If India is facing adverse balance of payments then Indian demand for US dollar will rise leading to rise in the price of dollar in terms of rupee. Hence, dollar will appreciate in external value and rupee will depreciate in external value. The new rate of exchange may be say \$1 = Rs. 60. This means 20% exchange depreciation of the Indian currency. Exchange depreciation will make exports cheaper and imports costlier. This will lead to a favorable balance of payments.

- **Devaluation:** Devaluation refers to deliberate attempts made by monetary authorities to bring down the value of home currency against foreign currency. Through devaluation the value of home currency goes down against foreign currency,



Example: Let us suppose the exchange rate remains \$1 = Rs. 10 before devaluation. When devaluation is affected which reduces in the value of home currency and now the exchange rate becomes \$1 = Rs. 20. This will make domestic goods cheaper in foreign market pushing to more exports. At the same time, demand for imports is reduced.

- **Exchange Control:** It is an extreme step taken by the monetary authority to enjoy complete control over the exchange dealings. When such step is taken, the central bank directs all exporters to surrender their foreign exchange which leads to concentration of exchange reserves in the hands of central authority. At the same time, the supply of foreign exchange is restricted only for essential goods.

**Non-Monetary Measures for Correcting the Balance of Payment:** A deficit country along with monetary measures may adopt the following non-monetary measures too which will either restrict imports or promote exports.

- **Tariffs:** Tariffs are duties (taxes) imposed on imports. When tariffs are imposed, the prices of imports would increase it will reduce the demand for imported goods and promote domestic producers to produce more of import substitutes. Non-essential imports can be drastically reduced by imposing a very high rate of tariff.
- **Quotas:** The government under quota system may fix and permit the maximum quantity or value of a commodity to be imported during a given period. Reduced imports will result in favorable balance of payment position.

Quotas are more effective than tariffs as they are certain, they are easy to implement. They are more effective even when demand is inelastic, as no imports are possible above the quotas, more flexible than tariffs as they are subject to administrative decision. However they are not long term solution and also open invitation to corruption.

- **Export Promotion:** Export promotion is used by government to build favorable balance of payments. This measure includes substitutes, tax concessions to exporters, marketing facilities, credit and incentives to exporters, etc. The government may also help to promote export through exhibition, trade fairs; conducting marketing research & by providing the required administrative and diplomatic help to tap the potential markets.

- **Import Substitution:** Import substitution as a measure used by government to reduce the volume of imports and make it self-reliant. Fiscal and monetary measures may be adopted to encourage industries producing import substitutes.

## 2.6 International Monetary System

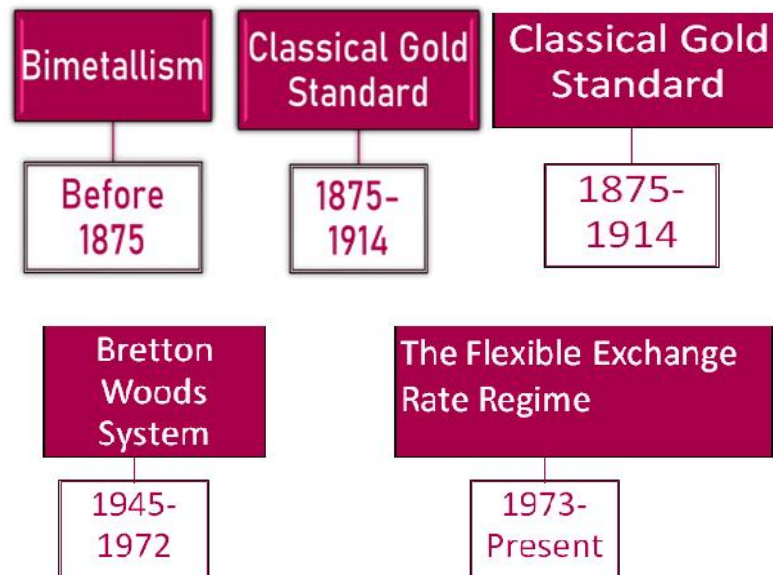
An international monetary system is a set of internationally agreed rules, conventions and supporting institutions which facilitate International trade cross border investment and re-allocation of capital between nation states.

The system must be adjustable, stable and liquid enough.

Through understanding current international monetary fund the manager would be able to better:

- Currency Management
- Business Strategy
- Corporate - Government Relations

## 2.7 Stages in International Monetary System



### **Bimetallism:**

Before 1875 a “double standard” in the sense that both gold and silver was used as money. Both gold and silver were used as international means of payment and the exchange rates among currencies were determined by either their gold or silver contents.

Gresham's law is an economic principle that states: "If coins containing metal of different value have the same value as legal tender, the coins composed of the cheaper metal will be used for payment, while those made of more expensive metal will be hoarded or exported and thus tend to disappear from circulation."

It is commonly stated as: "“Bad” (abundant) money drives out “Good” (scarce) money”

### **The Gold standard, 1876-1913:**

The gold standard, as an International Monetary System, gained acceptance in Western Europe in the 1870s and existed as a historical reality during the period 1875-1914. The classical gold standard thus lasted for approximately 40 years. The center of the international financial system during this period was London reflecting its important position in international business and trade.

The three important features of the gold standard were,

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- First, country defines its national monetary unit in terms of gold.
- Second, free import or export of gold.
- Third, stable ratio for two-way convertibility between gold and national currencies. The above three conditions were met during the period 1875 to 1914.



Example: Let us take the example of the dollar. The US declared the dollar to be convertible to gold at a rate of 20.67/ ounce of gold. The British pound was pegged to gold at a rate of 4.2474/ ounce of gold. Thus, the dollar pound exchange would be determined as-

$20.67/\text{ounce of Gold} / 4.2464/\text{ounce of gold} = \text{dollar } 4.86656$ . Now the value of pound in relation to dollar is 4.86656

If the cost of moving gold between countries was two per cent per British pound the fluctuation would be 2 cents above or below the par value. The upper limit is known as gold export point and the lower limit is known as gold import point. The pound could not have risen from the gold export point because than the US importer would find economical to buy gold with dollar and ship the gold as a payment to British creditor instead of paying higher unnecessary to buy pound.

At the same time the pound could not have fallen from 4.84 the gold import point because than the British importer would find better to convert pound into gold for payment. The cost of shipping gold would be less than the high cost of buying dollars for payment.

### **Decline of the Gold standard**

There are several reasons why the gold standard could not function well over the long run. One of the problems was the price-specie-flow mechanism. For this mechanism to function effectively, certain "rules of the game" that govern the operation of an idealized international gold standard must be adhered to.

One rule is that the currencies must be valued in terms of gold. Another rule is that the flow of gold between countries cannot be restricted. The last rule requires the issuance of notes in some fixed relationship to a country's gold holdings.

#### **Arguments in Favor of a Gold Standard**

- Highly stable exchange rates under the classical gold standard provided an environment that was favorable to international trade and investment
- Misalignment of exchange rates and international imbalances of payment were automatically corrected by the price-specie-flow mechanism

#### **The Inter-war Years, 1914-1944:**

The gold standard as an International Monetary System worked well until World War I. There was widespread fluctuation in currencies in terms of gold during World War I and in the early 1920s.

The role of Great Britain as the world's major creditor nation also came to an end after World War I. As countries began to recover from the war and stabilize their economies, they made several attempts to return to the gold standard.

The United States returned to gold in 1919 and the United Kingdom in 1925. The world economy characterized by tremendous instability leading to Great Depression (1930 - 39)

All countries' situations could have been bettered through international cooperation which led to Bretton Woods's agreement in 1944 by 44 nations at Bretton Woods, New Hampshire. The purpose was to design a postwar international monetary system.

Under the Bretton Woods system, the U.S. dollar was pegged to gold at \$35 per ounce and other currencies were pegged to the U.S. dollar. Each country was responsible for maintaining its exchange rate fixed: within  $\pm 1\%$  of the adopted par value by buying or selling foreign reserves as necessary.

#### **The Demise of the Bretton Woods System**

## International Financial management

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In the early post-war period, the U.S. government had to provide dollar reserves to all countries who wanted to intervene in their currency markets. U.S. dollars held abroad grew rapidly leading to cast some doubt on the U.S.'s ability to convert dollars into gold upon request.

Large amount of US dollars was held outside the USA that it was more than the total gold holdings of the USA. On 15th Aug 1971, President Nixon suspended the system of convertibility of gold and dollar and decided for floating exchange rate system.

### **2.8 The Smithsonian Agreement**

Attempt to save Bretton Woods system, 10 major countries met at the Smithsonian Institute, Washington in December 1971. The world moved from Bretton Woods to the Smithsonian Agreement.

The Smithsonian Agreement reestablished an international system of fixed exchange rates without the backing of silver or gold, and allowed for the devaluation of the U.S. dollar. This agreement was the first time in which currency exchange rates were negotiated.

The following conditions were agreed -

- Price of gold was raised to \$38 per ounce - Countries revalued its currency against US dollars up to 10%
- Exchange rate band was expanded to 2.25 %

Devaluation of dollar did not improve the situation. Therefore the agreement lasted for two years which lead to flexible exchange rate regime.

#### **The Flexible Exchange Rate Regime, 1973 - Present:**

The Board of Governors of the IMF appointed committee initiated an exchange rate system that could be acceptable to the member countries. Systems are classified based on flexibility in the exchange rates-

1. Fixed exchange rate: A currency is pegged to a foreign currency, with fixed parity. The rates are maintained constant. When a currency moves over the limits, government intervenes to keep it within the band.
2. Flexible exchange rate: Involves market forces determining the exchange rate without intervention of government.

The turmoil in exchange markets did not cease when major currencies were allowed to float since the beginning of March 1973. Since 1973, most industrial countries and many developing countries allowed their currencies to float with government intervention, whenever necessary, in the foreign exchange market.

Within the flexible exchange rate regime there are three categories,

1. Floating
  - Independent floating system
  - Managed floating systems
2. Pegging
3. Target Zone Arrangements
  1. Floating
    - Independent floating system

Independent floating system does not involve intervention and so termed as 'clean floating'. The purpose of intervention is simply to moderate the exchange rate and to prevent any undue fluctuation. But no attempt is undertaken to achieve/maintain a particular rate.

- Managed floating systems

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Managed floating is also known as 'dirty floating'. It involves direct or indirect intervention to stabilize the exchange rate. While indirect intervention includes change of interest rates and direct intervention include purchase and sell foreign currency in the domestic market.

2. Pegging: Combine the advantages of fixed exchange rate with flexibility of floating exchange rate. It fixes the exchange rate at a given level which is responsive to changes in market conditions it is allowed to crawl pegging.



Did you know? : A Crawling Band allows a periodic adjustment of the exchange rate band itself. The system is shaped to peg at a certain value but at the same time is designed to "glide" to response to external market uncertainties.

3. Target – zone arrangements: Target zone arrangement involves member countries having fixed exchange rate among their currencies. Alternatively, they may use a common currency.

Arguments in favor of flexible exchange rates

- Easier external adjustments
- National policy autonomy
- Arguments against flexible exchange rates
- Exchange rate uncertainty may hamper international trade
- No safeguards to prevent crises



Task: "Dollar has a very prominent position in the world trade today." Do you agree? Elucidate with example.

### Summary

Balance of payment is a systematic record of all economic transaction of a country with the rest of world where as balance of trade is a part of balance of payment. Balance of payment works on the same principals of double entry system. It includes current account, capital account and the official reserve account. Balance of payment account is not always balance. There are monetary and non-monetary measures for correcting the balance of payment.

An international monetary system impacts the finance manager decisions and exchange of currencies between countries. International monetary system is studied in four stages such as bimetallism before 1875, gold standard from 1875-1913, inner war period from 1914-44, brettonwood system from 1945-1972 and flexible exchange regime from 1973 till present.

The flexible exchange rate regimes are divided into three categories which are floating, pegging and target zone arrangement. In floating there is independent and managed floating which is also known as dirty float.

### Keywords

**Balance of Payment:** Balance of Payment is a statement shows all economic transactions done by the country with the remaining world.

**Balance of Trade:** Balance of Trade is a statement that shows the country's export and import of goods with the remaining world.

**Deflation:** In economics deflation is general decline in prices of goods and services..

**Exchange depreciation:** It means decline in the rate of exchange of domestic currency in terms of foreign currency. It is the situation in which financial markets of domestic and global economies are linked together.

**Bimetallism** It is a situation in which both gold and silver both are used as a payment mechanism.



Devaluation: It is a deliberate attempt made by monetary authorities to bring down the value of home currency against foreign currency.

### Self Assessment

1. Balance of period is a record is a record pertaining to a----- period of time.
  - A. Definite
  - B. Indefinite
  - C. Both
  - D. None
  
2. A "negative" balance of trade, or trade deficit, occurs when a country's imports are-----  
-----then its exports.
  - A. More
  - B. Less
  - C. Equal
  - D. None of the above
  
3. ----- investment occurs when the investor acquires equity such as purchases of stocks, the acquisition of entire firms, or the establishment of new subsidiaries.
  - A. Direct
  - B. Portfolio
  - C. Both
  - D. None
  
4. ----- investments represent sales and purchases of foreign financial assets such as stocks and bonds that do not involve a transfer of management control.
  - A. Direct
  - B. Portfolio
  - C. Both
  - D. None
  
5. Under a \_\_\_\_\_ system, the market force, based on demand and supply, determines a currency's value.
  - A. Fixed
  - B. Flexible
  - C. Both of the above
  - D. None of the above
  
6. The gold standard worked well until World War I interrupted trade flows and disturbed the stability of exchange rate for currencies.
  - A. World War I
  - B. World War II
  - C. World War III
  - D. Not Applicable

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7. International Monetary System can be analyzed in ----- stages
- A. One
  - B. Two
  - C. Three
  - D. Four
8. In International Monetary System oldest stage in four stages is-----.
- A. The Gold standard
  - B. The Bretton Woods System
  - C. Inter war period
  - D. Not Applicable
9. The inter-war years from ----- were characterized by political instabilities and financial crisis
- A. Before 1875
  - B. Between 1875-1913
  - C. 1914-1944l
  - D. Not Applicable
10. The Bretton Woods System, as an International Monetary System, existed as a historical reality during the period -----.
- A. Between 1875-1913
  - B. Before 1875
  - C. 1914-1944 l
  - D. 1945-1972
11. Deflation means -----prices.
- A. Falling
  - B. Rising
  - C. Equal
  - D. Not Applicable
12. Contraction in money supply in the economy will reduce purchasing power reducing demand. This will lead to less imports thereby correcting balance of payments.
- A. True
  - B. False
13. Exchange depreciation means increase in the rate of exchange of domestic currency in terms of foreign currency.
- A. True
  - B. False
14. Quotas are more effective than tariffs as they are certain and are easy to implement.

International Financial management

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A. True

B. False

15. Independent floating system does not involve intervention and so termed as 'clean floating'.

A. True

B. False

**Answers for Self Assessment**

1. A      2. B      3. A      4. B      5. B

6. A      7. D      8. A      9. C      10. D

11. A      12. A      13. B      14. A      15. A

**Review Questions**

1. Differentiate between balance of trade and balance of payment.
2. Trace the evolution of foreign exchange from fixed to floating exchange rates in the International Monetary System.
3. Compare fixed and flexible monetary system with their advantages and disadvantages.
4. Enumerate implications of International monetary system for finance manager.
5. Explain in detail monetary and non-monetary measure to correct disequilibrium in balance of payment.

**Further Readings**

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**Web Links**

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[https://www.rbi.org.in/Scripts/BS\\_PressReleaseDisplay.aspx?prid=50879](https://www.rbi.org.in/Scripts/BS_PressReleaseDisplay.aspx?prid=50879)

[https://en.wikipedia.org/wiki/International\\_monetary\\_system](https://en.wikipedia.org/wiki/International_monetary_system)

## Unit 03: Foreign Exchange Markets

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### Objective

After studying this unit, you should be able

- understand meaning and significance of the foreign exchange market.
- assess functions and structure of the foreign exchange market.
- understand participants and users of the foreign exchange market.
- apply Hedging with forward, futures and options.

### Introduction

In a typical foreign exchange transaction, a party purchases a quantity of one currency by paying a quantity of another currency, i.e., currencies are bought and sold against each other. The foreign exchange market determines the relative values of different currencies.

Globally, operations in the foreign exchange market started in a major way after the breakdown of the Bretton Woods system in 1971, which also marked the beginning of floating exchange rate regimes in several countries. The decade of the 1990s witnessed a perceptible policy shift in many emerging markets towards the reorientation of their financial markets with a liberalized operational framework.

The changing contours were mirrored in a rapid expansion of foreign exchange market in terms of participants, transaction volumes, decline in transaction costs and more efficient mechanisms of risk transfer.

### International Financial Management

It is by far the busiest and most active of the financial markets, with turnover comfortably exceeding that of bonds and equities.

#### **3.1 The Foreign Exchange Market-Meaning&Definition**

In simple words foreign exchange market refers to a market where foreign currencies are bought and sold. Let us see one of the definitions to make it more clear-

**"The foreign exchange market is a place where foreign currencies are bought and sold"**C. P. Kindle Berger

Analyzing the definition we can say-

- It is a mechanism through which payments are affected between two countries having different currency system.
- In a narrow sense, it is the sale and purchase of foreign currencies and the rate at which currencies are converted.
- In a broader sense, it includes all those methods and mechanism which facilitates foreign payment.

#### **3.2 The Foreign Exchange MarketFeatures**

The foreign exchange market is unique because of

- its huge trading volume representing the largest asset class in the world leading to high liquidity;
- its geographical dispersion;
- its continuous operation: 24 hours a day except weekends, i.e., trading in the market is open 24 hours a day in different parts of the world, from 5 p.m. EST on Sunday until 4 p.m. EST on Friday;

The foreign exchange market is unique because of

- the variety of factors that affect exchange rates;
- the low margins of relative profit compared with other markets of fixed income; and
- the use of leverage to enhance profit and loss margins and with respect to account size.

#### **3.3 The Foreign Exchange Market-Functions**

The following are the important functions of a foreign exchange market:

- **Transfer Function:** To transfer finance from one nation to another. Such transfer is affected through foreign bills or remittances made through telegraphic transfer. Transfer of purchasing power is necessary because international transactions normally involve parties in countries with different national currencies.
- **Credit Function:** To provide credit for international trade. Because the movement of goods between countries takes time, inventory in transit must be financed.
- **Hedging Function:** To make provision for hedging facilities, i.e., to facilitate buying and selling spot or forward foreign exchange. The foreign exchange market provides "hedging" facilities for transferring foreign exchange risk to someone else.

#### **3.4 Structure of Indian Forex**

As per FERA the responsibility and the authority of the foreign exchange administration is vested with the RBI. They have formed the foreign exchange dealers association of India,

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which frames rules regarding the conduct of business and coordinates with the RBI in the proper administration of foreign exchange control.

**First Tier Market:** The first tier covers the transactions between the Reserve Bank (RBI) and authorized dealers (AD'S)

In the first tier of the market RBI buys and sell foreign currencies from the AD'S. AD'S sells foreign currency which they acquired in primary market at the rate administered by the RBI.

**Second Tier Market:** The second-tier market is the interbank market where AD'S transact business among themselves. They normally do their business within the country. They do it normally through a recognized broker.

**Third Tier Market:** The third tier of the forex is represented by the primary market where AD'S transact in foreign currency with the customer. The tourist exchange currency, exporter and importer exchange currency and all these transactions comes under the primary market.

1st tier (AD's & RBI)

2nd tier (AD&AD)

3rd tier (AD and customer)

The foreign exchange or forex market is the largest financial market in the world – larger even than the stock market, with a daily volume of \$6.6 trillion, according to the 2019 Triennial Central Bank Survey of FX and OTC derivatives markets. There is a 40% increase in daily forex trading volume noted over the last decade.

The major participants in the foreign exchange market comprise-

- Corporates
- Commercial banks
- Exchange brokers
- Central banks

Foreign exchange market is of two types, viz.; retail market and the wholesale market, also termed as the inter-bank market.

In the retail market, travelers and tourists exchange one currency for another. The total turnover in this market is very small. Wholesale market comprises of large commercial banks, foreign exchange brokers in the inter-bank market, commercial customers, primarily MNCs and Central banks which intervene in the market from time to time to smooth exchange rate fluctuations or to maintain target exchange rates.

Over 90% of the total volume of transactions is represented by inter-bank transactions and the remaining 10% by transactions between banks and their non-bank customers.

### **3.5 User of Currency Futures**

#### **Hedgers**

Operators, who want to transfer a risk component of their portfolio. Hedgers wish to eliminate or reduce the price risk to which they are already exposed.

#### **Speculators**

Operators, who intentionally take the risk from hedgers in pursuit of profit. Speculators are a class of investors who willingly take price risks to profit from price changes in the underlying assets.

#### **Arbitrageurs**

Operators who operate in different markets simultaneously, in pursuit of profit and to eliminate mispricing. Arbitrageurs profit from price differentials existing in two markets by simultaneously operating in two different markets

Hedgers and investors provide the economic substance to any financial market. Without them, the markets would lose their purpose and become mere tools of gambling.

Speculators provide liquidity and depth to the market.

### International Financial Management

Arbitrageurs bring price uniformity and help with price discovery.

The market provides a mechanism by which diverse and scattered opinions are reflected in one single price of the underlying.

### **3.6 Foreign exchange transactions**

The Foreign Exchange Transactions refers to the sale and purchase of foreign currencies. Simply, the foreign exchange transaction is an agreement of exchange of currencies of the country for another at an agreed exchange rate on a definite date.

**Spot Transaction:** A spot transaction is when the buyer and seller of different currencies settle their payments within the two days of the deal. It is the fastest way to exchange currencies. Here, the currencies are exchanged over a two-day period, which means no contract is signed between the countries. The exchange rate at which the currencies are exchanged is called the Spot Exchange Rate. This rate is often the prevailing exchange rate. The market in which the spot sale and purchase of currencies is facilitated is called a Spot Market.



Example: Spot exchange rate for the value of the Euro versus the U.S. Dollar would be 1.2000 for the EUR/USD currency pair, where the Euro is the base currency and the U.S. Dollar is the counter currency. This implies to a forex trader that \$1.20 would be required to purchase one Euro for value in two business days.

Transactions per day reached an average of \$6.6 trillion per day in April 2019, of which around \$2 trillion were spot transactions.

**Forward Transaction:** A forward transaction is a future transaction where the buyer and seller enter into an agreement for sale and purchase of currency after 90 days of the deal at a fixed exchange rate on a definite date in the future. The rate at which the currency is exchanged is called a Forward Exchange Rate.

The market in which the deals for the sale and purchase of currency at some future date are made is called the Forward Market.



Example: Charlotte Co. expects to receive 100,000 euros from exporting products to a Dutch firm at the end of each of the next 3 months. The spot rate of the euro is \$1.10. The forward rate of the euro for each of the next 3 months is also \$1.10. Charlotte Co. expects that the euro will depreciate to \$1.02 in 3 months.

If Charlotte Co. does not use a forward contract, it will convert the euros received into dollars at the spot rate that exists in 3 months.

Thus, Charlotte expects that its dollar cash inflows would be \$8,000 higher as a result of hedging with a forward contract and decides to negotiate a forward contract to sell 100,000 euros forward. If Charlotte Co. were an investor instead of an exporter, and expected to receive euros in the future, it could have used a forward contract in the same manner.

**Future Transaction:** Future transactions are also forward transactions and deals with the contracts in the same manner as that of normal forward transactions. However, the transactions made in a future contract differ from the transactions made in the forward contract on the following grounds:

The forward contracts can be customized at the client's request, while the future contracts are standardized, such as the features, date, and the size of the contracts are standardized.

The future contracts can only be traded on the organized exchanges, while the forward contracts can be traded anywhere depending on the client's convenience.

No margin is required in case of the forward contracts, while margins are required by all the participants and an initial margin is kept as collateral so as to establish the future position.



Example: Let us now look at an example that involves currency futures. Say you purchase 8 future Euro contracts (€125,000 per contract) at 0.89 US\$/€. At the end of the day, the settlement price has moved to 0.91 US\$/€. How much have you lost or profited?

The price has increased meaning you have profited. The calculation to determine how much you have profited is as follows:

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$$(0.91 \text{ US\$/€} - 0.89 \text{ US\$/€}) \times \text{€}125,000 \times 8 = 20,000 \text{ US\$}$$

**Swap Transactions:** The Swap Transactions involve a simultaneous borrowing and lending of two different currencies between two investors. Here, one investor borrows the currency and lends another currency to the second investor.

The obligation to repay the currency is used as collateral, and the amount is repaid at a forward rate. Swap contracts enable investors to use funds in their own currency to pay off obligations denominated in a different currency without incurring any foreign exchange risk.



Example: Company A is doing business in USA and it has issued bond of \$ 20 Million to bondholders that has been nominated in US \$. Other company B is doing business in Europe. It has issued bond of \$ 10 Million Euros.

Company A will get \$ 10 million Euros Bonds with its interest payment and Company B will get \$ 20 million bond for exchanging his principle and interest. This is the simple example of currency swap.

**Option Transactions:** Option Transactions: The foreign exchange option gives an investor the right, but not the obligation to exchange the currency in one denomination to another at an agreed exchange rate on a pre-defined date.

An option to buy the currency is called a Call Option, while the option to sell the currency is called a Put Option.

**Call Option:** Call Option is an option is a contract between two parties giving the taker (buyer) the right, but not the obligation, to buy or sell a parcel of shares at a predetermined price, possibly on or before a predetermined date. To acquire this right, the taker pays a premium to the writer (seller) of the contract.



Example: Sam purchases a December call option at Rs. 40 for a premium of Rs. 15. That is he has purchased the right to buy that share for Rs. 40 in December. If the stock rises above Rs. 55 (40+15) he will break even and he will start making a profit. Suppose the stock does not rise and instead falls, he will choose not to exercise the option and forego the premium of Rs. 15 and thus limit his loss to Rs. 15.

**Put Option:** A Put Option gives the holder the right to sell a specific number of shares of agreed security at a fixed price for a period of time.



Example: Sam purchases 1 (Infosys Technologies) AUG 3500 Put --Premium 200. This contract allows Sam to sell 100 shares of Infosysat Rs. 3500 per share at any time between the current date and the end of August. To have this privilege, Sam pays a premium of Rs. 20,000 (Rs. 200 a share for 100 shares). The buyer of a put has purchased the right to sell it. The owner of a put option has the right to sell it.

Thus, the Foreign exchange transaction involves the conversion of a currency of one country into the currency of another country for the settlement of payments.

### 3.7 Currency Futures Contract

A future contract is a standardized agreement that calls for the delivery of a currency at some specified future date. Major features of Futures are-

- Organized Exchange
- Standardization
- Clearing House
- Margins
- Marking to Market

A future buyer is said to be in a long position and a future seller is said to be in a short position.



## International Financial Management

**Currency Futures Contract:** A currency future, also known as an FX future, is a future contract to exchange one currency for another at a specified date in the future at a price (exchange rate) that is fixed on the purchase date.

On NSE, the price of a future contract is in terms of INR per unit of other currency, e.g. US dollars. Currency future contracts allow investors to hedge against foreign exchange risk.

Currency Derivatives are available on four currency pairs viz. US Dollars (USD), Euro (EUR), Great Britain Pound (GBP) and Japanese Yen (JPY).

### 3.8 Foreign Exchange Rates

Forward Rate = Spot Rate + Forward Premium/- Forward Discount

- If the forward rate is higher than spot rate, it will be the case of forward premium.



Example of Forward Premium: Consider this example of an exchange between the Japanese Yen and the U.S. dollar. The ninety-day yen to dollar (¥ / \$) forward exchange rate is 109.50. The spot rate ¥ / \$ rate is = 109.38. Calculation for an annualized forward premium =  $(109.50 - 109.38 \div 109.38) \times (360 \div 90) \times 100\% = 0.44\%$ .

- If the forward rate is less than the spot rate, it will be the case of a forward discount.



Example Forward Discount: Consider this example of an exchange between the Japanese Yen and the U.S. dollar. The ninety-day yen to dollar (¥ / \$) forward exchange rate is 109.38. The spot rate ¥ / \$ rate is = 109.50. Calculation for an annualized forward discount =  $(109.50 - 109.38 \div 109.38) \times (360 \div 90) \times 100\% = 0.44\%$ .

Forward Discount and Premium

Longer the Maturity, the greater is the change in forward rates.

Longer Maturity greater is the spread. This is because uncertainty in future increases with length of future.

### 3.9 Foreign Exchange Quotations

Types of Quotations: In forex where different currencies are bought and sold. It is essential to know the ratio between different currencies or how many units of one currency will be equal to one unit of another currency. There are two ways to quote exchange rates: direct and indirect.

**Direct Quotation-** It is the home currency price of one unit of foreign currency e.g. if the Indian rupee is the home currency and the foreign currency is the French franc FF

Rs.6.84/ff read as Rs.6.84 per French franc

**Indirect Quotation:-** It is the foreign currency price of one unit of home currency.

FF.1462/Rs. reads as .1462 French franc per rupee

Which means one Indian rupee can buy .1462 French franc

So, Direct quote = 1/ Indirect quote, and vice versa.

Bid / Offer: Bid is the purchase price of a currency quoted by an A.D. Whereas offer ( or ask rate) is the selling price of a currency quoted by an A.D. A bid for one currency is simultaneously an offer for another currency.

For instance, \$1 = Rs.44.50/44.55 offer bid

The difference between these two quotes forms a profit and is also known as a spread. For instance, suppose the buy price is 44 and the sell price is 44.30, with a spread of .30.

Thus, his spread = offer - bid.

The bid-ask spread is often stated in % terms that can be computed as follows:

Spread =  $\frac{\text{Ask} - \text{Bid}}{\text{Ask price}} \times 100$

### Unit 03: Foreign Exchange Markets

If the bid price for a stock is \$19 and the ask price for the same stock is \$20, then the bid-ask spread for the stock in question is \$1. The bid-ask spread can also be stated in percentage terms; it is customarily calculated as a percentage of the lowest sell price or ask price. For the stock in the example above, the bid-ask spread in percentage terms would be calculated as \$1 divided by \$20 (the bid-ask spread divided by the lowest ask price) to yield a bid-ask spread of 5% ( $\$1 / \$20 \times 100$ ).

## 3.10 Concept of Hedging

Hedging forms a vital component of risk strategy. If a company has operations in multiple currencies, the failure to implement a foreign exchange strategy may significantly affect the company's profit margins from international sales. The most common method of hedging currency risk is through the use of hedging products, such as currency swaps, forward contracts and options.

**Hedging:** Hedging refers to an offsetting contract made in order to insulate the home currency value of receivables or payables denominated in foreign currency. Objective of hedging is to offset exchange risk arising from transaction exposure.

- Used everywhere all time
- Negative event cannot be prevented
- Similar to insurance
- Not to make money but to reduce losses

Types of Hedging: The various types of hedging as per the instruments are-

- Forward Market Hedges: Use forward contracts to offset exchange rate exposure
- Money Market Hedges: Use borrowing and lending in the money markets
- Hedging with Swaps: Use combination of forward and money market instruments
- Hedging with Foreign Currency Futures
- Hedging with Foreign Currency Options

**Hedging in Forward Market:** To nullify future spot rate two situations-

- Expected Inflows of Foreign Currency: Make forward contracts to sell the foreign currency at a specified rate to insulate against depreciation of value of that foreign currency (in terms of home currency).
- Expected Outflows of Foreign Currency: Make forward contracts to buy the foreign currency at a specified rate to insulate against appreciation of value of the currency (in terms of home currency).



Example: You are a U.S. importer of British woolens and have just ordered next year's inventory. Payment of £100M is due in one year.

One way to fix the cash outflow in dollars is to put you in a position that delivers £100M in one year – a long forward contract on the pound.

**Hedging in Future Market:** Hedgers want to avoid price risk through holding a position in the derivatives market. Different hedgers take different positions in the derivatives market based on their exposure in the underlying market. A hedger normally takes an opposite position in the derivatives market to what he has in the underlying market. Hedging in futures market can be done through two positions, viz. short hedge and long hedge

- Short Hedge: A short hedge involves taking a short position in the futures market. Short hedge position is taken by someone who already owns the underlying asset or is expecting a future receipt of the underlying asset.
- Long Hedge: A long hedge involves holding a long position in the futures market. This strategy is used by those who will need to acquire the underlying asset in the future.

**Hedging by an Importer (Long Hedge)**

Let us assume that there is a company in India, ABC Ltd, which is in the business of producing industrial equipment's. To make this equipment's, ABC Ltd imports certain parts from its US supplier. It is expected that next import would take place on October 31st, 2021 to the tune of \$1 million, the payment for which would be made 3 months down the line, i.e. on January 31st, 2022.

What is the risk here? One of the biggest risks is the Forex exposure risk. Because ABC Ltd would-be making payment in US Dollars a few months down the line, it is exposed to currency risk. It stands to lose if the Dollar appreciates in value over the next three months. Let's see how this happens. At the time of receiving the delivery (October 31st, 2021), let us suppose that USD/INR spot rate is 70. This means, as on October 31st,2021, ABC Ltd will be required to pay 7 crores (\$1 million - 70) in order to receive \$1 million from its bank, which would then be paid to the US supplier. But what if three months down the line, on January 31st, 2022, USD/INR has appreciated to 75, In that case, ABC will now have to pay 7.5 crores to receive the same \$1 million (\$1 million - 75). Hence, ABC Ltd would be paying an additional 50 lacs, because of the adverse movement in currency.

In order to safeguard against such risks, ABC Ltd could hedge its exposure using currency futures. As we already know, three months down the line, ABC Ltd would need \$1 million, which translates to 1,000 lots of USD/I NR futures (remember, 1 lot is \$1,000; so, 1,000 lots are  $1,000 * \$1,000 = \$1$  million).As ABC Ltd needs to make payment on January 31st, 2022 and hence is exposed to the risk of USD/INR appreciating till then, it could hedge by going long 1,000 lots of USD/INR January 2020 futures. Let us suppose that, currently, January 2022 USD/INR futures is trading at 71. By buying 1,000 lots at an average rate of 71, ABC Ltd has hedged itself against currency risk. Let us now see what could happen on January 31st, 2022.

If USD/INR appreciates to, say 75, as we have already seen earlier, ABC Ltd would lose 50 lacs in the spot segment  $[(70 - 75) * \$1 \text{ million}]$ . In the futures segment however, ABC Ltd would gain 4,000 per lot  $[(75 - 71) * 1,000 * 1]$ , for a total gain of 40 lacs (4,000 per lot \* 1,000 lots). In this case, its net loss would be 10 lacs (40 lacs gain in futures - 50 lacs loss in spot). On the other hand, if USD/INR depreciates to, say, 65, ABC would gain 250 lacs in the spot segment  $[(70 - 65) * \$1 \text{ million}]$ . In the futures segment though, ABC Ltd would lose 6,000 per lot  $[(65 - 71) * 1,000 * 1]$ , for a total loss of 60 lacs (6,000 per lot 1,000 lots). In this case, its net loss would be 10 lacs (50 lacs gain in spot - 60 lacs loss in futures).

As we can see, the loss is the same in both cases Rs.10 lacs. This is because ABC Ltd is essentially locking in the future exchange rate at 71 when the spot rate is 70.

No matter where the currency heads till January 31st, 2022, ABC Ltd will make a fixed loss of 10 lacs, which is nothing but the difference between the spot price (70 and the futures price (71) at the time of initiation times the underlying exposure (\$1 million),

**Hedging by an Exporter (Short Hedge)**

Let us say XYZ Ltd is in the business of exporting precious stones and one of its clients is in the US. XYZ has received an order from this US client to deliver certain stones on October 31st, 2021, the payment for which would be received by XYZ in US Dollars 3 months down the line, i.e. on January 31st, 2022.

Let us assume that the value of USD/INR on October 31st is 70 in the spot market and that total value of the contract is \$0.5 million. As the payment would be received 3 months down the line, XYZ is exposed to the risk of USD/INR depreciating over the next three months. In order to safeguarding against Rupee appreciation, XYZ decides to short 500 lots of January 31st, 2022 USD/INR futures. Let us assume that the prevailing futures exchange rate is 70.50.

Let us now see what could happen on January 31st, 2022.

If USD/INR appreciates to, say 75, XYZ Ltd would gain 25 lacs in the spot segment  $[(75 - 70) * \$0.5 \text{ million}]$ . In the futures segment however, ABC Ltd would lose 4,500 per lot  $[(70.50 - 75) * 1,000 * 1]$ , for a total loss of 22.5 lacs (4,500 per lot \* 500 lots). In this case, its net gain would be 2.5 lacs (25 lacs gain in spot - 22.5 lacs loss in futures). On the other hand, if USD/INR depreciates to, say, 65, XYZ would lose 25 lacs in the spot segment  $[(65 - 70) * \$0.5 \text{ million}]$ . In the futures segment though, XYZ Ltd would gain 5,500 per lot  $[(70.50 - 65) * 1,000 * 1]$ , for a total gain of 27.5 lacs (5,500 per lot x 500 lots). In this case, its net gain would be 2.5 lacs (27.5 lacs gain in futures - 25 lacs loss in spot).

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Again, the gain is the same in both the cases (2.5 lacs). This is because XYZ Ltd is essentially locking in the future exchange rate at 70.50 when the spot rate is 70.

**Speculating Using Currency Futures:** Unlike a hedger, a speculator does not have any underlying exposure in the Forex market. Instead, a speculator trades with the sole objective of trying to make money by taking a directional view on the currency and assuming risk thereon.

Let us try to understand how a speculator trades using currency futures.

Long Position in USD/INR Futures



Example: Let us assume that Mr. A is bullish on the outlook of USD/INR due to his expectations that the interest rate differential between India and US will shrink, leading to Dollar outflows from India. As a result, he decides to initiate a long position on 50 lots of USD/INR futures contract at CMP 70.0000 and hold it till the expiry of the contract. If his view holds true and USD/INR futures rallies to, say, 72.0000 by expiry, he would exit his long position and profit 100,000 [(72.0000 - 70.0000) 1,000 x 50]. However, if his view does not materialize and a USD/INR future drop to, say, 68.0000 down by 2 he will have a loss of 100,000.

Short Position in USD/INR Futures



Example: Let us assume that USD/INR has given a technical breakdown on the daily chart, because of which Mr. B has turned bearish on the short-term outlook of USD/INR. As a result, he decides to initiate a short position on 50 lots of USD/INR futures contract at CMP 70.0000 and hold it over the next few days. If his view holds true and USD/INR futures declines to, say, 68.0000 in the next few days, he would exit his short position and profit 100,000 [(70.0000 - 68.0000) \* 1,000 \* 50]. However, if his view does not materialize and USD/INR futures rises to, say, 72.0000 in the next few days, he would exit his short position and lose he will have a loss of 100,000.

**Hedging Futures Markets with Protective Put:** This hedging strategy involves an investor buying a put option for a fee, called a premium. It is just like buying an insurance.



Example: Mr. A Long Nifty @ 11800 /- Rupees for lot size of 75 & feeling discomfort due to economic data result which is not as per their expectation. For minimize risk in future price Mr. A take contrary position in option by taking 1 contract of Nifty put option strike price of Rs 11800 & pays a premium of Rs 100. Now we analyze the scenario after 1 month.

Let's see the scenario where Nifty Future Price is 12200.

- Profit in Nifty Future Price = (12200-11800) \*75 = 30000
- Loss in Put Premium = (100\*75) = (7500)
- Net Profit & Loss = (30000-7500) = 22500 Rs

**Hedging Futures Markets with Protective call:** It is a strategy in which a trader who has an existing short position in the underlying buys call options to guard against increase of the price of that security.



Example: Mr. A Short Nifty @ 11800/-Rupees for lot size of 75 & feeling discomfort due to economic data result which is not as per their expectation. For Minimize risk in Future price Mr.A take contrary position in option by taking 1 Contract of Nifty Call Option strike price of Rs 11800 & pays a premium of Rs 100. Now we analyze the scenario after 1 month.

Let's see the scenario where Nifty Future Price is 12200.

- Loss in Nifty Future Price = (11800-12200) \*75 = (30000) Profit in Call Premium = 100\*75 = (7500)
- Net Profit & Loss = (30000- 7500) = (22500) Rs



Task: "Hedging occupies prominent position in the world trade today." Do you agree? Elucidate with example.

### **Summary**

Foreign exchange market is the largest market in terms of volume which is greater than equity and commodities market. In simple term foreign exchange market is the market where currencies are bought and sold. The structure of forex market in India is three tier market structures. Inter-bank market occupies major volume in forex market.

Hedgers are the operators, who want to transfer a risk component of their portfolio. Hedgers wish to eliminate or reduce the price risk to which they are already exposed. Speculators are the operators, who intentionally take the risk from hedgers in pursuit of profit. Speculators are a class of investors who willingly take price risks to profit from price changes in the underlying assets. Arbitrageurs are the operators who operate in different markets simultaneously, in pursuit of profit and to eliminate mispricing. Arbitrageurs profit from price differentials existing in two markets by simultaneously operating in two different markets

Hedging is the technique position is taken to insulate the home currency value of receivables or payables denominated in foreign currency. A long hedge involves holding a long position in the futures market. This strategy is used by those who will need to acquire the underlying asset in the future. A short hedge involves taking a short position in the futures market. Short hedge position is taken by someone who already owns the underlying asset or is expecting a future receipt of the underlying asset. Hedging can also be done with options by buying protective call and put.

### **Keywords**

**Bid:** It is the offer made by an investor, trader, or dealer in order to buy an asset or to compete for a contract.

**Call Option:** Call Option is a contract between two parties giving the taker (buyer) the right, but not the obligation, to buy at a predetermined price.

**Arbitrageurs:** Arbitrageurs is a contract made where operator buy in one market where price is low and sells in market where price is more.

**Hedging:** Hedging is contract made in order to insulate the home currency value of receivables or payables denominated in foreign currency.

**Speculators:** Speculators are a class of investors who willingly take price risks to profit from price changes in the underlying assets.

**Indirect Quotation:-** It is the foreign currency price of one unit of home currency.

### **Self Assessment**

1. If the forward rate is higher than the spot rate in the forward market, the currency is trading at a forward .....
    - A. Premium
    - B. Discount
    - C. Both
    - D. Equal
2. If the forward rate is lower than the spot rate in the forward market, the currency is trading at a forward .....
    - A. Premium
    - B. Discount
    - C. Equal

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- D. Both of the above
3. -----accounts for majority of all transactions in foreign exchange market.
- A. Customer market
  - B. Interbank market
  - C. Both
  - D. None
4. ----- covers the transaction between the authorized dealers (AD'S) and authorized dealers(AD'S).
- A. First tier Market
  - B. Second tier Market
  - C. Three tier Market
  - D. None
5. The difference between the bid price and the ask Price is called a .....
- A. Spread
  - B. Gallop
  - C. Arbitrage
  - D. Beta
6. .... quotations refer to the price of foreign currency in terms of one unit of home Currency.
- A. Direct quotation
  - B. Indirect quotation
  - C. Gallop quotation
  - D. Not Applicable
7. ----- Operators who intentionally take the risk from hedgers in pursuit of profit.
- A. Hedgers
  - B. Speculators
  - C. Both of the above
  - D. None of the above
8. Longer the maturity ----- is the spread.
- A. Higher
  - B. Lower
  - C. Equal
  - D. Not Applicable
9. A -----involve holding a long position in the futures market.
- A. Long Hedge
  - B. Short Hedge

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- C. Both of the above  
D. Not Applicable
10. A -----involve holding a short position in the futures market.  
A. Long Hedge  
B. Short Hedge  
C. Both of the above  
D. Not Applicable
11. Direct quote = 1/ Indirect quote, and vice versa.  
A. True  
B. False  
C. All facts are not given  
D. Not Applicable
12. Foreign exchange market is the world's largest market with a daily turnover.  
A. True  
B. False
13. The second-tier market is the interbank market where AD'S transact business among themselves.  
A. True  
B. False
14. Put option is an option is a contract between two parties giving the taker (buyer) the right, but not the obligation, to buy or sell a parcel of shares at a predetermined price.  
A. True  
B. False
15. Arbitrageurs are an operator who brings uniformity in two markets.  
A. True  
B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. B  | 4. C  | 5. B  |
| 6. A  | 7. B  | 8. A  | 9. A  | 10. B |
| 11. A | 12. A | 13. A | 14. B | 15. A |

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## **Review Questions**

1. Elaborate structure and participants of foreign exchange market.
2. Differentiate between speculation and hedging with appropriate example.
3. Compare forward and future contract with their features.
4. What do you mean by Hedging?
5. Differentiate between long and short hedge with appropriate example.



## **Further Readings**

Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.



## **Web Links**

- <https://corporatefinanceinstitute.com/resources/knowledge/finance/foreign-exchange/>
- <https://www.marketwatch.com/market-data/currencies>
- <https://www.vedantu.com/commerce/the-foreign-exchange-market>
- <https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/hedging/>
- <https://www.wallstreetmojo.com/hedging/>



## Unit 04: Foreign Exchange Determination

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### Objective

After studying this unit, you should be able

- understand how exchange rates are determined.
- explore various factors influencing exchange rate.
- understand concept of arbitrage and its significance.
- Interpret the implications of exchange rate theories.

### Introduction

An exchange rate is a price exactly the same as any other price to acquire something else. In this case it is another currency.

So an exchange rate is the price of one currency in terms of another. In other words it is the price you will pay in one currency to get hold of another.

#### **4.1 Demand & Supply aspect of Exchange rate determination:**

To determine price the two important factors are demand and supply. *Let's take the case of one foreign currency that is dollar to understand how this market works.*

Thus, the dollar-rupee exchange rates will depend on how the demand-supply balance moves. When the demand for dollars in India rises and supply does not rise correspondingly, each dollar will cost more rupees to buy.

#### **Where does the supply of dollars come from?**

The supply of dollars comes from several sources-

- One obvious source is Indian exporters of goods and services who sell their wares in the international market for dollars.
- Another important source is Indian immigrant workers abroad who repatriate money to their kin at home.

- The third major source is investments by foreign individuals, companies or institutions in India.
- Foreign tourists visiting India would also contribute to the inflow of dollars.

#### **What factors determine the demand for dollars?**

- Just as exporters earn dollars, importers spend them. Imports are thus the most important source of demand for dollars.
- Another major source of demand is individuals or companies repatriating incomes or profits to their home countries. This would include portfolio investors as well as Indian branches of multinationals sending back some of their profits to the parent company as dividends.
- A third source would be Indians investing abroad, whether as firms or as individuals.
- Besides this, of course, the forex you buy when you travel abroad is also adding to the demand for dollars.

#### **What role do expectations play in all this?**

As in any market, expectations and the consequent speculation play a significant role.

For instance, when there is an expectation that the dollar will rise against the rupee, exporters tend to hold back their earnings for a while in the hope of getting a higher rate when they ultimately bring their dollars in. This, of course, skews the supply-demand equation even further confirming their initial expectations and thus setting off a vicious cycle.

Similarly, importers who expect to pay more for their dollars tomorrow will try and buy up as much as they can today, adding to the current demand and making the dollar rise even more. Currency traders in such a situation would also try to benefit by betting on what the future price of the dollar would be.

#### **What can the RBI do about it?**

With hundreds of billions of dollars in its reserves, the RBI would seem to have the ability to be a major factor in how the dollar moves. If, for instance, it were to dump a huge amount of dollars in the market, it could dramatically add to the supply and hence reduce the price.

Thus demand, supply, future expectation and intervention of central bank will impact the exchange rate.

## **4.2 Factors Influencing Exchange Rates:**

**Inflation rates:** Typically, a country with a consistently lower inflation rate exhibits a rising currency value, in comparison to countries with higher inflation which exhibits depreciation in their currency. This is also usually accompanied by higher interest rates.

**Interest rates:** Higher domestic (real) interest rates attract investment funds causing an increase in supply of foreign currency.

**Monetary policy and economic performance:** If a country has a history of strong economic performance and sound monetary policy, investors are more inclined to seek out those countries. This inevitably increases the demand and value of the country's currency.

**Changes in future expectations:** Any improvement in future expectations regarding the domestic currency or economy will decrease the demand for currency and increase the supply of foreign currency.

**Political & economic risk:** A country with less risk for political turmoil will be more attractive to foreign investors, leading to an appreciation of the value of its domestic currency from foreign capital.

**Government Debt:** Government debt is public debt or national debt owned by the central government. A country with government debt is less likely to acquire foreign capital, leading to inflation.

**Import and export value:** A country's balance of payments (BOP) summarizes all international trade and financial transactions made by individuals, companies and government bodies that country. If the price of a country's exports is greater than their imports, its 'terms of trade' have improved. This creates a greater demand for that country's exports, and in-turn, greater demand for the currency. Like many of

### Unit 04: Foreign Exchange Determination

the other factors influencing exchange rates, the converse reaction can also occur. If the exports rise by a smaller rate than the imports, the value of that country's exports and currency decrease in value.

**Technical factors:** Technical factors like release of national statistics, seasonal demands for a currency, slight strengthening of a currency following a prolonged weakness also leads to change in exchange rates.

## 4.3 Arbitrage

Arbitrageurs attempt to profit from pricing inefficiencies in the market by making simultaneous trades that offset each other and capture a risk-free profit.

An arbitrageur may also seek to make profit in case there is price discrepancy between the stock price in the cash and the derivatives markets.



Example, if on 1st June, 2021 the SBI share is trading at Rs. 1780 in the cash market and the futures contract of SBI is trading at Rs. 1790, the arbitrageur would buy the SBI shares (i.e. make an investment of Rs. 1780) in the spot market and sell the same number of SBI futures contracts. On expiry day (say 24 June, 2021), the price of SBI futures contracts will close at the price at which SBI closes in the spot market.

In other words, the settlement of the futures contract will happen at the closing price of the SBI shares and that is why the futures and spot prices are said to converge on the expiry day. On expiry day, the arbitrageur will sell the SBI stock in the spot market and buy the futures contract, both of which will happen at the closing price of SBI in the spot market.

Since the arbitrageur has entered into off-setting positions, he will be able to earn Rs. 10 irrespective of the prevailing market price on the expiry date. Thus Arbitrageurs bring price uniformity and help price discovery.

### Spot and Future Pricing

From pricing perspective forward and futures follow the same principle. Futures price is based on spot price and the cost of carry for the period less benefits of ownership.

$$F_1 = S_0 \times (1+r)$$

$$F_1 = S_0 \times e^{rt} \text{ for continuous compounding}$$

Where  $F_1$  is forward/futures price with contract expiring at  $t = 1$ ,  $S_0$  is spot price at  $t = 0$  and  $r$  is the cost of carry for the period 0 to 1.



Example: Consider the present value of NIFTY index is 3150. The 3-m interest rate is 12% per annum while the dividend yield on the index is estimated to be 6%. Fair value of the index future with 90 days remaining for maturity is

$$= \text{Value of Index} + \text{Cost of carry for 90 days} - \text{Dividend benefit for 90 days}$$

$$= 3150 + 3150 \times 12\% \times 90/365 - 3150 \times 6\% \times 90/365$$

$$= 3150 + 93.20 - 46.60 = 3196.60$$

So the fair price on the basis of cost to carry is 3196.60. If futures are priced differently than its fair value then it offers arbitrage opportunity

### Cash and Carry Arbitrage

Cost of carry model eliminates arbitrage. If futures is mispriced it offers arbitrage one way or the other.

Cash and Carry Arbitrage: When forward is overpriced:

- Spot price of 10 gms gold at Rs 27,000
- Risk free rate of 10% per annum
- Fair price of 1-year futures contract is 29,700 (spot + Cost of Carry)
- Forward contract for period of 1 year is trading at Rs 30,000 (overpriced)
- Arbitrageur can take following actions at  $t = 0$ :

- Borrow Rs 27,000
- Buy gold spot, and
- Sell forward contract at Rs 30,000.
- At the end of forward contract
- Realize cash from forward contract + Rs 30,000
- Pay back the borrowed money and interest thereon - Rs 29,700
- Profit = Rs 300

Since forward was overpriced by Rs 300 the arbitrageur can pocket this profit by selling the futures first and buying gold by borrowing.

### **Reverse Cash and Carry Arbitrage**

Reverse Cash and Carry Arbitrage is there when forward is underpriced:

- When forward is underpriced at Rs 27,300 the arbitrageur can take following actions:
- Borrows gold
- Sells gold at Rs 27,000 and lends at 10% and
- Buys a forward contract at Rs 27,300.
- One year later:
- Realize cash from lending activity + Rs 29,700
- Pay for the forward contract & return borrowed gold - Rs 27,300
- Profit Rs 2400

### **Convergence**

The difference of futures price and spot price is called basis. As time progresses, basis declines and becomes zero on the day of maturity i.e. spot and futures price converge.

### **Basis Risk**

Basis is the difference between the spot and futures price = S-F. Basis risk arises because of the uncertainty about the basis when the hedge is closed out.

### **Foreign exchange arbitrage**

Purchase of a currency in the monetary center where it is cheaper and selling immediately in the monetary center where it is more expensive in order to make a profit.

Profit-cost of electronic transfer of currency.

Suppose USD and INR

- According to the dominant economic theory, the exchange rate of a currency should be the same all across the world. But due to certain factors like difference in time zones and lag in the exchange rate, a price differential gets created.
- To take advantage of the situation, a trader can buy the currency in the market where it is priced lower and sell in a market where the currency is priced higher. A gain can
- be made only if the exchange rate is higher than the transaction cost.

### **Two-point arbitrage**

Two-point arbitrage concerns two currencies in two geographically separated markets.



Example: Let us suppose two different markets have bid-ask price as-

- London: GBP/USD 1.5495 - 1.5505
- New York: GBP/USD 1.5995 - 1.6005.

Selling dollars in London, the arbitrageur would have been quoted the offer rate of 1.5505 and, thus, would have received £644,953.24.

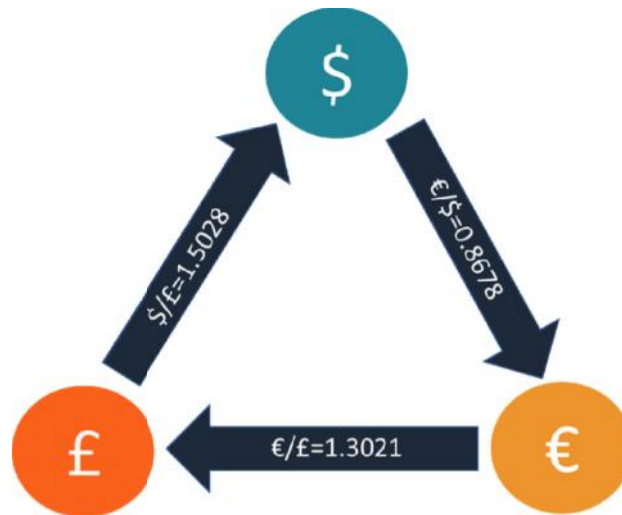
### Triangular arbitrage

A triangular arbitrage or three-point arbitrage is an advanced version of the two-point arbitrage. It involved three currencies or securities instead of two. A triangular arbitrage opportunity arises when there is a mismatch in the exchange rate of three different currencies.

In a three-point international arbitrage, the trader sells currency 'A' and buys currency 'B'. Then he/she sells currency 'B' and buys currency 'C'. In the last leg of the arbitrage, he/she sells currency 'C' and buys currency 'A'.



Example: Sam is an FX trader with \$1 million on hand. He detects the following exchange rates



Using the cross-rate formula, Sam determines that the  $€/\pounds$  rate is undervalued. The cross-rate for the pair must be equal to  $€/\pounds = 0.8678 \times 1.5028 = 1.3041$ .

Triangular arbitrage can be applied to the three currencies – the US dollar, the euro, and the pound. To execute the triangular arbitrage opportunity, Sam should perform the following transactions:

- Sell dollars for euros:  $\$1,000,000 \times 0.8678 = \text{€}867,800$
- Sell euros for pounds:  $\text{€}867,800 / 1.3021 = \text{£}666,461.87$
- Sell pounds for dollars:  $\text{£}666,461.87 \times 1.5028 = \$1,001,558.90$

By utilizing the discrepancies in the price quotations of the three currencies, Sam managed to turn his initial \$1,000,000 into \$1,001,558.90, with a profit of \$1,558.90. Note, that due to the small price discrepancy (only 0.002), even the use of a substantially large capital resulted in relatively small profits. In our simplified example, we did not account for transaction costs. Therefore, in real life, the profit would be even smaller.

### Covered interest arbitrage

When a trader uses a forward contract to hedge against the exchange rate risk while investing in a higher-yielding currency, it is known as covered interest arbitrage.

In a covered interest arbitrage, the word 'cover' means to hedge against fluctuations in the exchange rate and 'interest arbitrage' means to take advantage of an interest rate differential.

## Uncovered interest arbitrage

Uncovered interest arbitrage is an arbitrage trading strategy whereby an investor capitalizes on the interest rate differential between two countries.

Unlike covered interest arbitrage, uncovered interest arbitrage involves no hedging of foreign exchange risk with the use of forward contracts or any other contract. The strategy involves risk, as an investor exposed to exchange rate fluctuations is speculating that exchange rates will remain favorable enough for arbitrage to be profitable. An arbitrageur executes an uncovered interest arbitrage strategy by exchanging domestic currency for foreign currency at the current spot exchange rate, then investing the foreign currency at the foreign interest rate, and at the end of the investment term using the spot foreign exchange market to convert back to the original currency.



Example: consider that an investor with \$5,000,000 USD is considering whether to invest abroad using an uncovered interest arbitrage strategy or to invest domestically. The dollar deposit interest rate is 3.4% in the United States, while the euro deposit rate is 4.6% in the euro area. The current spot exchange rate is 1.2730 \$/€. For simplicity, the example ignores compounding interest. Investing \$5,000,000 USD domestically at 3.4% for six months ignoring compounding, will result in a future value of \$5,170,000 USD. However, exchanging \$5,000,000 dollars for euros today, investing those euros at 4.6% for six months ignoring compounding, and exchanging the future value of euros for dollars at the future spot exchange rate (which for this example is 1.2820 \$/€), will result in \$5,266,976 USD, implying that investing abroad using uncovered interest arbitrage is the superior alternative if the future spot exchange rate turns out to be favorable.

## Locational Arbitrage

In simple words, a locational arbitrage is when a trader tries to benefit from the discrepancies in the exchange rates between two banks for the same currency.

Locational Arbitrage is one of three popular types' arbitrages common in the FX or Forex market. The other two being are Triangular Arbitrage and Covered Interest Arbitrage.

### Example of a Locational Arbitrage



Example: Suppose bank A offers a USD/GBP rate of 1.50/1.55, and bank B offers a USD/GBP rate of 1.56/1.58. In this case, there is an arbitrage opportunity if a trader buys one GBP from bank A for \$1.55 and then sells the same to bank B for \$1.56. In the transaction, a trader would make \$0.01 per GBP. Now, what if we change the rates that bank B offer to 1.54/1.58? Does arbitrage opportunity still exist? No, there is no arbitrage opportunity now. Even if a trader buys GBP from bank A at \$1.55, but the rate that bank B is offering is \$1.54. So, the trader will lose \$0.01 per GBP here.

**Cross Rate:** The cross rate is the currency exchange rate between currency A and currency C derived from exchange rate between currency A and currency B and between currency B and currency C.

A cross rate by definition may be any exchange of any two currencies that are not the official currency of the country in which the quote is published. In practice, any currency exchange in which neither of the currencies is the U.S. dollar is considered a cross rate.



Example: A cross rate is the exchange rate between two countries computed from each country's exchange rate against a third country. For example, since most currencies are quoted against the U.S. dollar, sometimes we need to work out the cross rates for currencies other than the U.S. dollar. If we interpret a:b as a "divide" sign, then a:b is actually b/a. Assume we have currencies a, b and c. If a:b and b:c are both known, then a:c = a:b x b:c. For example, if the Mexico peso (MXN) is selling for \$0.0923 (MXN:USD = 0.0923) and the buying rate for the EUR is \$0.7928 (USD:EUR = 0.7928), then the MXN/EUR cross rate is MXN:EUR = 0.0923 x 0.7928 = 0.0732.

## Conclusion

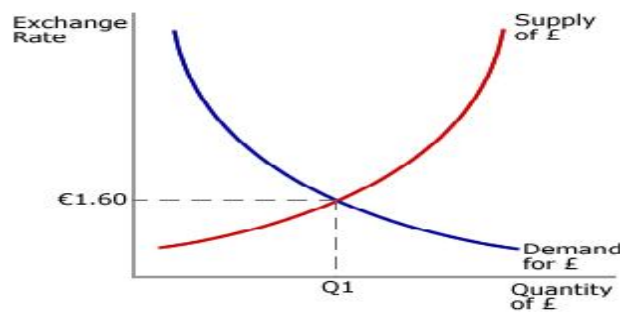
- Locational arbitrage ensures that quoted exchange rates are similar across banks in different locations.
- Triangular arbitrage ensures that cross exchange rates are set properly.
- Covered interest arbitrage ensures that forward exchange rates are set properly. o Any discrepancy will trigger arbitrage, which will then eliminate the discrepancy. Arbitrage thus makes the foreign exchange market more orderly.

## 4.4 Exchange rate determination theories

### Demand and Supply Theory of Exchange Rate

An exchange rate is a price exactly the same as any other price. So an exchange rate is the price of one currency in terms of another. In other words, it is the price you will pay in one currency to get hold of another.

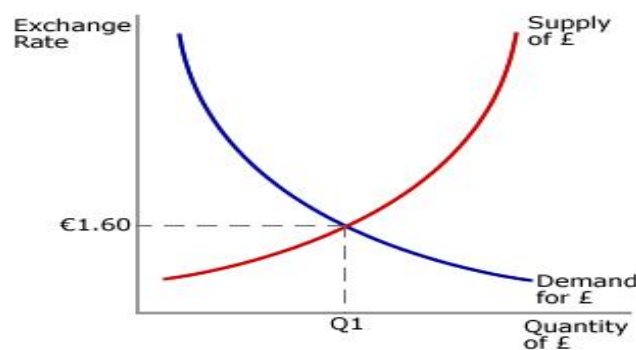
Supply and Demand: The exchange rate, just like commodities, determines its price responding to the forces of supply and demand. Therefore, if for some reason people increase their demand (shift of the curve from D to D1) for a specific currency, then the price will rise from A to B, provided the supply remains stable. On the contrary, if the supply is increased (shift of the curve from S to S1), the price will decline from A to C, provided the demand remains stable (figure P1). Where supply is equal to demand is the equilibrium exchange rate, as shown in the diagram below



Let us see the supply and demand aspects of dollar in UK: In UK demand of dollar comes from importer, individuals or companies repatriating incomes or profits to their home countries, people investing abroad, whether as firms or as individuals, travel by UK person abroad is also adding to the demand for dollars.

Similarly demand of dollar in UK comes from exporters of goods and services, immigrant workers abroad who repatriate money, investments by foreign individuals, companies or institutions in UK and Foreign tourists visiting UK.

The equilibrium rate is where supply is equal to demand, and this will change as supply and demand changes. Say, for example, that interest rates increase. This will tend to attract more overseas investment into the UK. To invest here, they will need to buy pounds, and so the demand for pounds will rise. This will not inevitably be the effect as there may be other factors affecting the exchange rate at the same time. However, supply and demand gives us a very useful tool for analyzing movements in the exchange rate.



**Mint Parity Theory of Exchange Rate**

Mint parity theory explains the determination of exchange rate between the two countries which are a gold standard. In a country which is of a gold standard, the currency is either made of gold or is convertible into gold at a fixed rate. There are also no restrictions on the export or import of gold.

The rate of exchange between the gold standard countries is determined on a weight-to-weight basis of the gold countries of their currencies. In other words, the exchange rate is determined by the gold equivalents of the currencies involved. The mint par is an expression of the ratio of weights of gold's used for the coinage of the currencies.

For examples before World War 1 England and American were on gold standard. The mint par between these two countries was pound, one of England+4.866 dollars of America. The rate of exchange showed that one pound of England contained as much fine gold as 4.866 dollars contained in America. The ratio of weights of metal 1 pound=\$4.866 was called the mint parity.

The mint par was a fixed rate. It remained so long as the monetary laws of the country remained unchanged. The current or the market rate of exchange, however, fluctuated from time to time due to changes in the balance of payments of the respective countries.

**Balance of Payments-Theory of Exchange Rate**

The balance of payments approach is another method that explains what the factors are that determine the supply and demand curves of a country's currency. As is known from macroeconomics, the balance of payments is a method of recording all the international monetary transactions of a country during a specific period of time.

The transactions recorded are divided into three categories: the current account transactions, the capital account transactions, and the central bank transactions. The aforementioned categories can show a deficit or a surplus, but theoretically the overall payments (the BOP as a whole) should be zero – which rarely happens.

The balance of payments theory of exchange rate holds that the price of foreign money in terms of domestic money is determined by the free forces of demand and supply on the foreign exchange market.

**Merits of the Theory**

- The main merit of the theory is that it brings the determination of exchange rate problem within the purview of the general equilibrium analysis.
- Secondly, the theory stresses the fact that, there are many predominant forces besides merchandise items (exports and imports of goods) included in the balance of payments which influence the supply of and demand for foreign exchange which in turn determine the rate of exchange.

Thus, the theory is more realistic in that the domestic price of foreign money is seen as a function of many significant variables, not just purchasing power expressing general price levels.

**Criticisms**

- The fundamental defect of the theory is that it assumes perfect competition, including no interference with the movement of money from one country to another. This is very unrealistic.
- The theory advocates that the rate of exchange is the function of the balance of payments. But, in practice it has also been found that the balance of payments position of a country is very much affected by the changes in the rate of exchange. Thus, it is equally true that the balance of payments is the function for the rate of exchange. In this sense, the theory is indeterminate as it confuses as to what determines what.



## Interest Rate Parity -Theory of Exchange Rate

Interest Rate Parity (IRP) theory is used to analyze the relationship between the spot rate and corresponding forward (future) rate of currencies. The theory further states size of the forward premium or discount on a foreign currency should be equal to the interest rate differentials between the countries in comparison.

Market forces cause the forward rate to differ from the spot rate by an amount that is sufficient to offset the interest rate differential between the two currencies. Then, covered interest arbitrage is no longer feasible, and the equilibrium state achieved is referred to as interest rate parity.

IRP is the concept of no-arbitrage in the foreign exchange markets (the simultaneous purchase and sale of an asset to profit from a difference in the price).

## 4.5 Types of IRP

### What Is Covered Interest Rate Parity?

Covered interest rate parity refers to a theoretical condition in which the relationship between interest rates and the spot and forward currency values of two countries are in equilibrium.

The covered interest rate parity situation means there is no opportunity for arbitrage using forward contracts, which often exists between countries with different interest rates.

### What Is Uncovered Interest Rate Parity (UIP)?

Uncovered interest rate parity (UIP) theory states that the difference in interest rates between two countries will equal the relative change in currency foreign exchange rates over the same period. It is one form of interest rate parity (IRP) used alongside covered interest rate parity.

If the uncovered interest rate parity relationship does not hold, then there is an opportunity to make a risk-free profit using currency and forex arbitrage.

### Violation of IRP

If interest rate parity is violated, then an arbitrage opportunity exists. The simplest example of this is what would happen if the forward rate was the same as the spot rate but the interest rates were different. Then investors would:

- borrow in the currency with the lower rate
- convert the cash at spot rates
- enter into a forward contract to convert the cash plus the expected interest at the same rate
- invest the money at the higher rate
- convert back through the forward contract
- repay the principal and the interest, knowing the latter will be less than the interest received.

### Implications of the Theory

- If domestic interest rates are less than foreign interest rates, you will invest in a foreign country at higher interest rates.
- Domestic investors can benefit by investing in the foreign market
- If domestic interest rates are more than foreign interest rates, you will invest in the domestic market at higher interest rates
- Foreign investors can benefit by investing in the domestic market

Interest rate parity is fundamental knowledge for traders of foreign currencies. In order to fully understand the two kinds of interest rate parity, however, the trader must first grasp the basics of forward exchange rates and hedging strategies. Armed with this knowledge, the forex trader will then be able to use interest rate differentials to his or her advantage.

**Limitations**

In recent years the interest rate parity model has shown little proof of working. In many cases, countries with higher interest rates often experience its currency appreciate due to higher demands and higher yields and has nothing to do with risk-less arbitrage.

**Purchasing Power Theory**

Managers of multinational firms, international investors, importers and exporters, and government officials must deal with these fundamental issues:

- Are changes in exchange rates predictable?
- How are exchange rates related to interest rates?
- What, at least theoretically, is the “proper” exchange rate?

To answer these questions, we need to first understand the economic fundamentals of international finance, known as parity conditions. Parity Conditions provide an intuitive explanation of the movement of prices and interest rates in different markets in relation to exchange rates.

The derivation of these conditions requires the assumption of Perfect Capital Markets (PCM).

- no transaction costs
- no taxes
- complete certainty

The starting point of exchange rate theory is purchasing power parity (PPP), which is also called the inflation theory of exchange rates. PPP can be traced back to sixteenth-century Spain and early seventeenth century England, but the Swedish economist Cassel (1918) was the first to name the theory PPP. According to Prof Cole, “The relative values of national currencies especially when they are not on the gold standard in the long run, are determined by their relative purchasing power in terms of goods and services”

By definition, the PPP states that using a unit of a currency, let us say one euro, which is the purchasing power that can purchase the same goods worldwide. • The theory is based on the ‘law of one price’, which argues that should a euro price of a good be multiplied by the exchange rate (€ /US\$) then it will result in an equal price of the good in US dollars.

In other words, if we assume that the exchange rate between the € and US \$ states at 1/1.2, then goods that cost € 10 in the EU should cost US\$ 12 in the United States. Otherwise, arbitrage will happen.

**The absolute PPP**

The absolute PPP is similar to the Law of One Price. The concept of the Law of One Price means that the prices of the same products in different countries should be equal when they’re measured in a common currency.

Consider the dollar–British pound exchange rate. The absolute PPP indicates the following:

$$\frac{\$}{\pounds} = \frac{P_{US}}{P_{UK}}$$

- where \$/£, P<sub>US</sub>, and P<sub>UK</sub> indicate the dollar-British pound exchange rate, the price level in the U.S., and the price level in the U.K., respectively. So:
- P<sub>US</sub> = P<sub>UK</sub> x E
- Therefore, for the absolute PPP to hold, the dollar–British pound exchange rate should reflect the ratio of the price levels in the U.S. (P<sub>US</sub>) and the U.K. (P<sub>UK</sub>).

The exchange rate between two currencies should equal the ratio of the countries’ price levels:

For example, if an ounce of gold costs \$300 in the U.S. and £150 in the U.K., then the price of one pound in terms of dollars should be:

- \$300/ £150 = \$2 / £

Since it deals only with the goods market, and not the assets market, it is a partial equilibrium theory. Actually, the preconditions for absolute PPP do not hold, since transport costs, tariffs, and technological and preferential differences exist at all times and places. Absolute PPP is rejected by most empirical surveys.

### The relative PPP

The relative PPP, on the other hand, indicates that the changes in the dollar-British pound exchange rate reflect the changes in the ratio of the U.S. and U.K. price levels (PUS and PUK):

$$\Delta \left( \frac{\$}{\pounds} \right) = \Delta \left( \frac{P_{US}}{P_{UK}} \right)$$

The relative form of PPP accounts for market imperfections like transportation costs, tariffs, and quotas. It states that the rate of price changes should be similar.

Empirically, both absolute PPP and relative PPP in the short run are rejected, but some studies find that relative PPP seems to hold in the long run.

#### Rationale behind PPP Theory

Suppose U.S. inflation > U.K. inflation. Greater U.S. imports from U.K. Less U.S. exports to U.K., So £ appreciates.

This shift in consumption and the appreciation of the £ will continue until

- In the U.S., price of UK goods is greater than and equal to price U.S good,
- In the U.K., price, U.S good is greater than and equal to price of UK goods

When inflation occurs, the exchange rate will adjust to maintain PPP

#### Illustration

Since  $P_f = P_h$  solving for  $e_f$  gives

$$e_f = \frac{(1 + I_h)}{(1 + I_f)} - 1$$

- If  $I_h > I_f$ ,  $e_f > 0$  (foreign currency appreciates)
- If  $I_h < I_f$ ,  $e_f < 0$  (foreign currency depreciates)
- If  $I_h = 5\%$  &  $I_f = 3\%$ ,  $e_f = 1.05/1.03 - 1 = 1.94\%$
- From the home country perspective, both price indexes rise by 5%.

Empirical Testing of PPP Theory: Substantial empirical research has been done to test the validity of PPP theory. The general conclusions of most of these tests have been that PPP does not accurately predict future exchange rates and that there are significant deviations from PPP persisting for lengthy periods.

### International Fisher Effect (IFE)

An investor saves his income through postponement of consumption. He expects a better return on his investment in future. He puts off his consumption anticipating the money saved can be consumed in the future and better returns can be earned on his investment.

If there is inflation his postponement is not effective.



Example: Suppose Mr. X's has a savings of Rs. 200,000 on 1st January 2015 and he invests this in a Mutual fund for two years and gets 12% per annum. His total wealth at the end of the second year (31st December 2016) will be Rs. 250880. Suppose he wants to construct a house, requires Rs. 200,000 for constructing the house on 1st January 2015 and for constructing the same home on 31st December 2016, he will require Rs. 300,000. Then whether the investment is profitable or not?

Thus, by not constructing the home on 1st January 2015 and postponing it to 31st December 2015, he incurred a loss.

When will the investments become profitable?

Thus, the return on investment must be more than the price increase (inflation). To ascertain the exact benefit and increase in wealth due to investment, the return on investment must be measured in terms of real rates and not nominal rates. To maximize the wealth of investors, the rate of return on investment must be more than the inflation rates. The nominal interest rate varies directly with the expected inflation rates. This proposition is known as the Fisher Effect.

Since the investors are concerned with the real interest rate, the nominal interest rate is composed of two elements:

- The real interest rate or the required rate of return and
- The expected rate of inflation.

The Fisher effect postulates a relationship between the nominal or actual interest rate and the real or inflation adjusted rate of return. The concept of real return can be extended to international investment as well. Accordingly, international return is guided by real return and not nominal return

Fisher effect also throws light on the international monetary policy followed by countries. Developing countries, especially those with a deficit balance of payment in the current account, to attract foreign investment, offer higher (or increased) nominal rates of interest.

The inflow of foreign capital increases the supply of foreign exchange, and surplus foreign exchange in the capital account can be used to make good of the deficit in the current account.

Fisher effect also says that foreign capital can be attracted through controlling inflation. But considering the difficulty in controlling inflation rate, politicians and authorities go to nominal rates. However, controlling of inflation rate is the better policy.

Thus, there is a direct relationship between nominal interest rate and inflation rate. High inflation leads to a high interest rate. Investment will take place only when the nominal rate of interest is higher than the real rate. Further, if the real rate of interest is common in all countries of the world, the difference in the nominal rate of interest will be due to inflation.

The relationship between the percentage change in the spot exchange rate over time and the differential between comparable interest rates in different national capital markets is known as the 'International Fisher Effect.' The IFE suggests that, given two countries, the currency in the country with the higher interest rate will depreciate by the amount of the interest rate differential.



Example: The real interest rate on South Korean government securities with one-year maturity is 4% and the expected inflation rate for the coming year is 2%. The real interest rate on U.S. government securities with one-year maturity is 7% and the expected rate of inflation is 5%. The current spot exchange rate for Korea won is \$1 = W1,200. Forecast the spot exchange rate one year from today.

#### **Solution**

We know that the nominal interest rate in the US is 12%, and in South Korea is 6%. The international Fisher effect suggests that the exchange rate will change in an equal amount but opposite direction to the difference in nominal interest rates (currency with the higher nominal rate will get weaker). Hence, since the nominal interest rate is higher in the US than in South Korea, the dollar should depreciate relative to the South Korean Won.

In other words, 1US\$ will buy fewer SK Won. Using the simple IFE formula

$$\text{Forward rate per 1\$} = ((1+0.06) / (1+0.12)) * 1200 = W1,138$$



Task: "Arbitrage can play in cash and future market when there overpricing and under pricing." Do you agree? Elucidate with example.

## Summary

In exchange rate determination demand and supply are the two important forces which impacts rates. Demand, supply future expectation and central bank intervention are the important factors for rate determination. Some of the factors which exchange rates are interest rates, inflation rates, country economic performance, export, imports, political and economic risk.

Arbitrage is buying and selling simultaneously in two markets to make profit from differences in two markets. In the overpriced future arbitrageur sell future and buy cash. In an underpriced future market he will buy cash and sell future. There are two-point arbitrage, triangular arbitrage, locational arbitrage and covered interest arbitrage.

There are several exchange rate theories like demand and supply theory, mint parity theory of exchange rate, interest rate theory and purchasing power theory. This theory gives insights on exchange rate determination aspects.

## Keywords

**Basis:** It is the difference between the spot and futures price= S-F. Basis risk arises because of the uncertainty about the basis when the hedge is closed out.

**Arbitrage:** It is a situation in which there exists discrepancy in price of asset, It involves the simultaneous purchase and sale of the same asset in different markets in order to profit from tiny differences in the asset's listed price

**Locational arbitrage:** It is acted to exploit the minor exchange rate differences for a given currency pair between multiple banks for generating a profit.

**Covered Interest Rate Parity:** Covered interest rate parity refers to a theoretical condition in which the relationship between interest rates and the spot and forward currency values of two countries are in equilibrium.

**The absolute PPP:** The absolute PPP means that the prices of the same products in different countries should be equal when they're measured in a common currency.

## Self Assessment

- The Foreign Exchange Market is the market which helps to convert one currency into the other .....
  - Currency
  - Stock
  - Commodity
  - Debt
- If the future is overpriced arbitrageur can -----futures.
  - Sell
  - Buy
  - No action can be done
  - Both of the above
- If the future is overpriced arbitrageur can -----futures.
  - Sell
  - Buy
  - (c)Both
  - (d)None
- is the difference between the spot and futures price= S-F.

- A. Basis
  - B. Beta
  - C. Standard deviation
  - D. Gamma
5. Exporters will ----- when there is depreciation in rupee.
- A. Gain
  - B. Loose
  - C. No Impact
  - D. Not Applicable
6. When there is an expectation that the dollar will rise against the rupee, exporters tend to hold back their earnings for a while in the hope of getting -----.
- A. Higher rate
  - B. Lower rate
  - C. Equal rate
  - D. Not Applicable
7. ----- Operators who intentionally take the risk from hedgers in pursuit of profit.
- A. Hedgers
  - B. Speculators
  - C. Both of the above
  - D. None of the above
8. Longer the maturity ----- is the spread.
- A. Higher
  - B. Lower
  - C. Equal
  - D. (d)Not Applicable
9. Nifty is at 3900. What should be the fair price of Nifty futures expiring 180 days from today. Risk free rate is 8% p.a..
- A. 4027
  - B. 4063
  - C. 4083
  - D. 4059
10. The correct formula for calculating future price is-----.
- A.  $F_1 = S_0 \times (1+r)$
  - B.  $F_1 = S_0 + (1+r)$
  - C. Both of the above
  - D. Not Applicable

Unit 04: Foreign Exchange Determination

11. A triangular arbitrage or three-point arbitrage is an advanced version of the two-point arbitrage. It involved ----- currencies or securities instead of two.
- A. Two  
B. Three  
C. Four  
D. (d)Not Applicable
12. Typically, a country with a consistently lower inflation rate exhibits a rising currency value, in comparison to countries with higher inflation which exhibits depreciation in their currency.
- A. True  
B. False
13. A country with less risk for political turmoil will be more attractive to foreign investors, leading to an appreciation of the value of its domestic currency from foreign capital.
- A. True  
B. False
14. An arbitrageur may also seek to make profit in case there is price discrepancy between the stock price in the cash and the derivatives markets.
- A. True  
B. False
15. Arbitrageurs are operators who speculate in cash market.
- A. True  
B. False

**Answers for Self Assessment**

1. A      2. B      3. A      4. A      5. A
6. A      7. B      8. A      9. D      10. A
11. B      12. A      13. A      14. B      15. A

**Review Questions**

1. Can futures contracts be used for speculation benefits? Support your answer with suitable numerical illustrations.
2. Differentiate between cash and carry arbitrage and reserve cash and carry arbitrage.
3. Elaborate Purchasing power theory with its implications.
4. What do you mean by Uncovered Interest Arbitrage?
5. Differentiate between two-point arbitrage and triangular arbitrage with appropriate example.



### **Further Readings**

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### **Web Links**

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## Unit 05: Foreign Exchange Spot and Derivative Market

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Summary

Keywords

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### Objective

After studying this unit, you should be able

- differentiate between spot and forward contract.
- analyzing implications of long and short forward contracts.
- differentiate between forward and futures.
- analyze aspects of currencies futures contract specifications.

### Introduction

Manager has to take many decisions not for current time but for future times also. Understanding spot forward and future contract will enhance the decisions to be taken in business. Currency future will make the decision in business to hedge against loss in International business.

### 5.1 Spot and Forward Contract

Let us understand the meaning and difference between spot and forward contract first-

#### **What is Spot Contract?**

Spot contract: In a spot contract, transactions are settled “on the spot”. Once a trade is agreed upon, the settlement – i.e. the actual exchange of money for goods – takes place with the minimum possible delay.



Example of spot market contract: Suppose a person goes to departmental store, when a person selects a shirt in a store and agrees on a price, the settlement (exchange of funds for goods) takes place immediately. That is a spot market.

**What are Forward Contracts?**

A contract between two parties for one party to buy something from the other at a later date at a price agreed upon.



Example of forward market contract: Suppose a buyer L and a seller S agree to do a trade in 100 grams of gold on 31 Dec 2021 at Rs.5,000/tola. Here, Rs.5,000/tola is the “forward price of 31 Dec 2021 Gold”.

**How it is different from Spot Market?**

In a spot market, transactions are settled “on the spot”. Once a trade is agreed upon, the settlement - i.e. the actual exchange of money for goods - takes place with the minimum possible delay.

In a forward contract, two parties irrevocably agree to settle a trade at a future date, for a stated price and quantity. No money changes hands at the time the trade is agreed upon.

**Why is forward contracting useful?**

Forward contracting is very valuable in hedging and speculation.

The classic hedging application would be that of a wheat farmer forward -selling his harvest at a known price in order to eliminate price risk.

A bread factory, on the other hand, may want to buy bread ahead of time to help with production planning while avoiding the risk of price fluctuations.

If a speculator has information or analysis which forecasts an upturn in a price, then he can go long on the forward market instead of the cash market. The speculator would go long forward, wait for the price to rise and then make a profit by reversing the transaction.

**What are the problems of forward markets?**

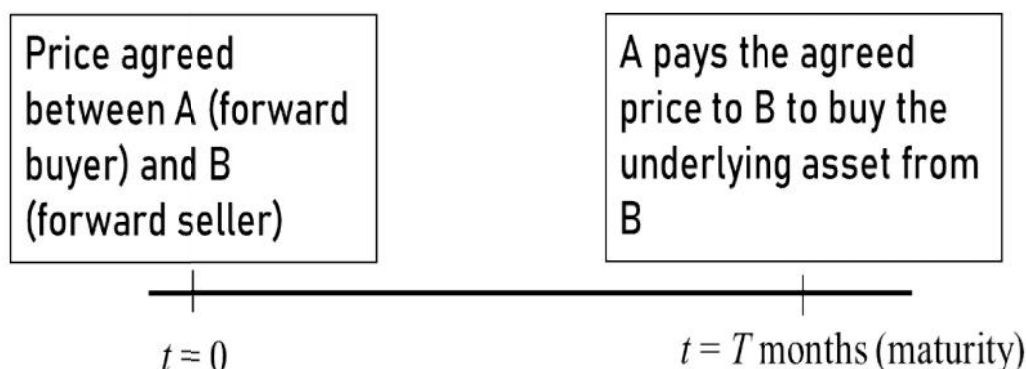
One basic problem of forward markets is that of too much flexibility and generality. The forward market is like the real estate market in that any two consenting adults can form custom-designed contracts against each other. In addition, forward markets are like the real estate market in that buyers and sellers find each other using telephones. This is inefficient and time-consuming. Every user faces the risk of not trading at the best price available in the country.

Forward markets worldwide are afflicted by several problems:

- (a) Lack of centralisation of trading,
- (b) Illiquidity, and
- (c) Counterparty risk.

**5.2 Forward Contracts -Long and Short**

A forward contract is a contractual agreement made directly between two parties, says A and B,



Unit 05: Foreign Exchange Spot and Derivative Market

**Party A (Long the forward contract/Long position/Buyer of the forward contract):** He agrees to buy the underlying asset at certain future time (maturity date) for an agreed contractual price (forward price) (delivery price).

**Party B (Short the forward contract/Short position/Seller of the forward contract):** He agrees to sell the underlying asset at maturity date for the forward price.

The terminal payoff of a financial contract is defined as the payoff of the contract at its maturity date. The terminal payoff of the forward contract with the maturity date T is given by:

**What is the payoff of a forward?**

**Long forward** = commitment to buy at forward price. A long forward makes money when price goes up.

=  $spotpriceatexpiration - forwardprice$

**Short forward** = commitment to sell at forward price. A short forward makes money when price goes down.

=  $forwardprice - spotpriceatexpiration.$



Example: Suppose you need gold, one year from now. The current price of gold is \$1000. You enter into an agreement with the vendor so as to purchase the gold a year from now at a price of \$1000.

In each of the three scenarios, what would be your profit/loss if the price of the gold after one year is?

- \$500
- \$1000
- \$1500

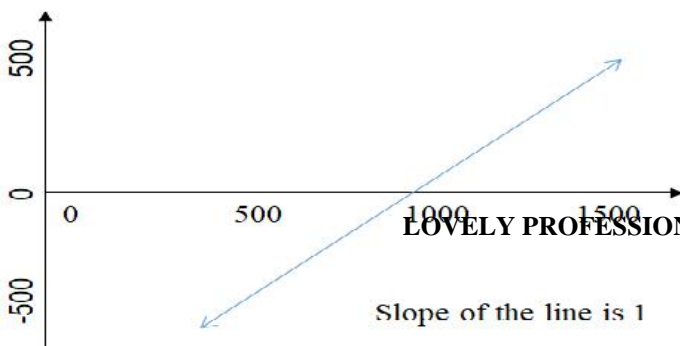
If you locked a fixed price of \$1000 for a gold after one year, your profit and loss would look like:

Agreed upon Price of gold (X=strike)	Price of gold (S=spot)	Profit and Loss from the Seller's Perspective (X-S)
1000	500	500
1000	1000	0
1000	1500	-500

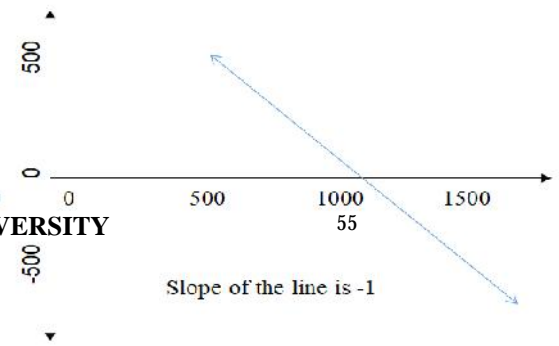
The Profit and Loss from the vendor's point of view:

Agreed upon Price of gold (X=strike)	Price of gold (S=spot)	Profit and Loss from the Seller's Perspective (X-S)
1000	500	500
1000	1000	0
1000	1500	-500

▪ Payoff from Buyer's Perspective



▪ Payoff from Seller's Perspective



### 5.3 What are Futures?

Let us now see meaning and implications of futures-

**Definition:** A contract between two parties for one party to buy something from the other at a later date at a price agreed upon today; subject to a daily settlement of gains and losses and guaranteed against the risk that either party might default

Futures are similar to forwards, except:

Futures trade on futures exchanges (CME, CBOT, LIFFE, etc.).

Futures are standardized contracts this increases their liquidity

Default risk for futures is lower because:

- The clearinghouse of the exchange guarantees payments.
- An initial margin is required.
- Futures contracts are “marked to market” daily (daily resettlement)

### 5.4 Value of a Futures Contract

Futures contracts, like forward contracts, have no value at the time of purchase.

Since futures contracts are marked to market daily, they differ from forward contracts as futures do not accrue value over the term of the contract, hence the value of a future contract will always be zero.

The value of a futures contract diverges from zero only during the trading hours between the times at which the account is marked to market (MTM):

**Value of futures contract = current futures price - previous mark to market price**

#### **Pay-off of Futures**

The Pay-off of a futures contract on maturity depends on the spot price of the underlying asset at the time of maturity and the price at which the contract was initially traded.

There are two positions that could be taken in a futures contract:

- Long position: One who buys the asset at the futures price (F) takes the long position
- Short position: One who sells the asset at the futures price (F) takes the short position

#### **Long Pay-off**

In general, the pay-off for a long position in a futures contract on one unit of an asset is:

#### **Spot Price-Strike Price**

Where Strike Price is the traded futures price and Spot Price is the spot price of the asset at the expiry of the contract (that is, the closing price on the expiry date).

**Long Pay-off Profit and Loss**

A long position holder will profit when the price rises which will be

$$\text{Profit} = \text{Spot Price} - \text{Strike Price}$$

Long position holders will lose money when the price goes up, generally

$$\text{Loss} = \text{Strike Price} - \text{Spot Price}$$

**Short Pay-off**

Similarly, the pay-off from a short position in a futures contract on one unit of asset is:

$$\text{Short Pay-off} = \text{Strike Price} - \text{Spot Price}$$

Where Strike Price is the traded futures price and Spot Price is the spot price of the asset at the expiry of the contract (that is, the closing price on the expiry date).

**Short Pay-off Profit and Loss**

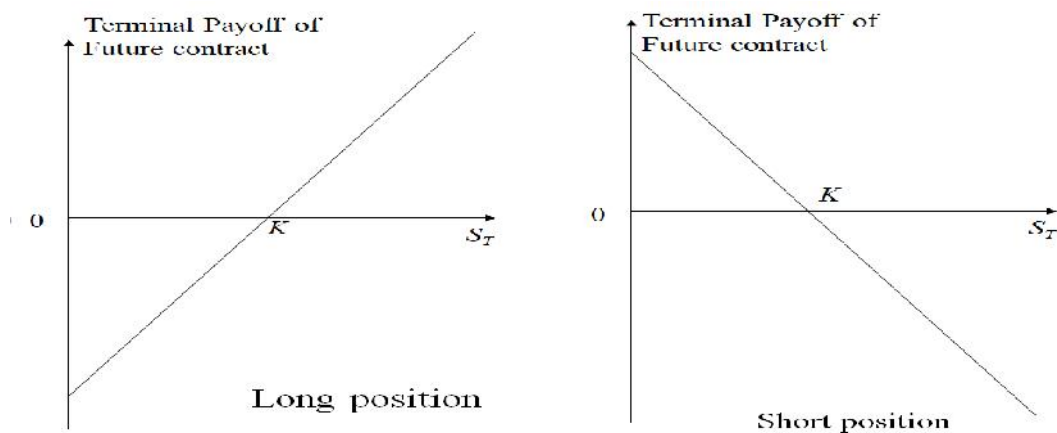
A short position holder will profit when the price rises which will be

$$\text{Profit} = \text{Strike Price} - \text{Spot Price}$$

Short position holders will lose money when the price goes up, generally

$$\text{Loss} = \text{Spot Price} - \text{Strike Price}$$

Pay-off of Futures: Pay off of the future as depicted in diagram-

**5.5 Foreword V/S Future**

Futures are broadly of two types-

- **Commodity futures:** Commodity futures are those where the underlying asset is a commodity. Contracts are available in India on agricultural commodities like Wheat, Rice, Soya, Coffee, Sugar, Tea, Jeera, Pepper, Cotton, Coconut, etc. Contracts on metals, Gold, Silver, are also available. Futures contracts on Crude oil are also commodity futures

- Financial futures: Financial futures are those where the underlying asset is a financial product. These are:

Currency Futures in which the underlying assets are currencies.

Stocks/Index futures in which the underlying assets are stocks or indices.

Interest Rate futures in which the underlying assets are interest rates.

The major points of difference in forward and futures are-

<b>Factors/Criteria</b>	<b>Foreword</b>	<b>Futures</b>
<b>Nature of Market</b>	Privately negotiated contracts	Traded on an exchange
<b>Nature of Contract</b>	Not standardized	Standardized contracts
<b>Liquidity</b>	Less Liquidity	Highly Liquid
<b>Counterparty Risk</b>	High counter party risk	Almost no counter party risk
<b>Mark to Market</b>	Not Done	Marked to Market everyday
<b>Margin</b>	No margin required	Margin are paid
<b>Settlement</b>	At the end of the period.	Follows daily settlement
<b>Squaring off</b>	Contract can be reversed only with the same counter-party with whom it was entered into	Can be reversed with any member of the exchange.

## 5.6 Currency Futures

A futures contract is a standardized contract, traded on an exchange, to buy or sell a certain underlying asset or an instrument at a certain date in the future, at a specified price. When the underlying asset is a commodity, e.g. Oil or Wheat, the contract is termed a “commodity futures contract”. When the underlying is an exchange rate, the contract is termed a “currency futures contract”.

In other words, it is a contract to exchange one currency for another currency at a specified date and a specified rate in the future. Therefore, the buyer and the seller lock themselves into an exchange rate for a specific value or delivery date. Both parties of the futures contract must fulfill their obligations on the settlement date.

## 5.7 Future contract specification

Every futures contract has an underlying asset, the quantity of the asset, delivery location, and delivery date. Every future contract is specified by exchange. When buyer and seller enter into contract everything about that contract is specified.

Following are the specifications required of a futures contract:

**Expiration:** Expiration (also known as maturity or expiry date) refers to the last trading day of the futures contract. After the expiry of a futures contract, the final settlement and delivery is made according to the rules laid down by the exchange in the contract specifications document.

**Contract Size:** Contract size, or lot size, is the minimum tradable size of a contract. It is often one unit of the defined contract. For example, the current contract size of the PMEX sugar contract is 10 tons. This implies that trading one contract creates a position of 10 tons of sugar.

**Initial Margin:** Initial margin is the minimum collateral required by the exchange before a trader is allowed to take a position. The level of initial margin is dependent on the price volatility of the contract. More volatile commodities generally have higher margin requirements.

### Unit 05: Foreign Exchange Spot and Derivative Market

**Price Quotation:** Price Quotation is the units in which the traded price of a contract is displayed. It can be different from the trading size of a contract and is often based on industry practices and conventions. While the contract size of the PMEX sugar contract is 10 tons, its price is quoted in Rupees per 100 kg.

**Tick Size:** Tick Size is the minimum movement allowed by the exchange in Price Quotation.

**Tick Value:** Tick Value refers to the minimum profit or loss that can arise from holding a position of one contract. Tick value depends on the size of the contract and its tick size. While it is often explicitly mentioned in contract specifications, it can be calculated by the formula:

$$\text{Tick Value} = \text{Contract Size} \times \text{Tick Size}$$

**Mark to Market:** Mark to market refers to the process by which the exchange calculates and values all open positions according to pre-defined rules and regulations.

Mark-to-market is an essential feature of exchange-traded futures contracts whereby the exchange ensures that all profit and losses are recognized by pricing them according to accurate market conditions. It is also an important feature for the risk management of positions of participants.

**Delivery Date:** Delivery date or delivery period refers to the time specified by the exchange during or by which the seller has to make delivery according to contract specifications and regulations. The delivery date is often later than the expiry date of a contract, especially in the case of physically delivered commodities.

**Daily Settlement:** Daily settlement refers to the process whereby the exchange debits and credits all accounts with daily profits and losses as calculated by the mark-to-market process. Daily settlement is necessary in order to recover losses and pay profits to respective accounts.



Example: Let us take the contract specification US Dollar – Indian Rupee (USD-INR)

The contract specification of USD-INR is given as under:

- Underlying Rate of exchange between one USD and INR
- Trading Hours (Monday to Friday) 09:00 a.m. to 05:00 p.m.
- Contract Size USD 1000 Tick Size 0.25 paise or INR 0.0025
- Trading Period Maximum expiration period of 12 months
- Contract Months 12 near calendar months
- Final Settlement date/ Value date Last working day of the month (subject to holiday calendars)
- Last Trading Day Two working days prior to Final Settlement Date Settlement Cash settled
- Final Settlement Price The reference rate fixed by RBI two working days prior to the final settlement date will be used for final settlement

### Summary

- International Financial Management involves taking decisions not only for current period but also for future period. Understanding spot, forward and future contract can help managers in taking decisions for future period.
- Spot contract settles on the spot where as in forward contract delivery takes place in future time and all terms of contract are agreed upon. In future contract third party is also involved which gives guarantee for the performance of contract.
- Currency futures are the futures it is a contract to exchange one currency for another currency at a specified date and a specified rate in the future. Every future contract has contract specifications which are specified by exchange.

**Keywords**

**Spot Contract:** It is a contract where transaction is settled on the spot which means price is paid and goods are delivered simultaneously.

**Forward Contract:** It is a contract where all terms and contract is done but delivery will be in future date.

**Future contract:** A contract between two parties for one party to buy something from the other at a later date at a price agreed upon today; subject to a daily settlement of gains and losses and guaranteed against the risk that either party might default.

**Commodity Futures:** Commodity futures are those where the underlying asset is a commodity.

**Financial Futures:** Financial futures are those where the underlying asset is a financial asset.

**Initial Margin:** Initial margin is the minimum collateral required by the exchange before a trader is allowed to take a position.

**Self Assessment**

1. Long forward = commitment to buy at forward price. Long position will make profit if spot price is -----than strike price.
  - A. Greater
  - B. Smaller
  - C. Equal
  - D. Not Applicable
  
2. Short forward = commitment to Sell at forward price. Short position will make profit if spot price is -----than strike price.
  - A. Greater
  - B. Smaller
  - C. Equal
  - D. Not Applicable
  
3. A person selects a shirt in a shop and agrees on a price, the settlement (exchange of funds for goods) takes place immediately. This is an example of-----
  - A. Spot Market
  - B. Forward Market
  - C. (c)Both
  - D. (d)None
  
4. The ----- is like the real estate market in that any two consenting adults can form custom-designed contracts against each other.
  - A. Forward
  - B. Future
  - C. Both of the above
  - D. None of the above
  
5. If the underlying asset of the derivative contract is currency it is the example of



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*Unit 05: Foreign Exchange Spot and Derivative Market*

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- A. Financial Derivative
  - B. Commodity Derivative
  - C. Both of the above
  - D. None of the above
6. If the underlying asset of the derivative contract is coffee it is the example of
- A. Financial Derivative
  - B. Commodity Derivative
  - C. Both of the above
  - D. None of the above
7. In future market ----- exist.
- A. Counterparty risk
  - B. No Counterparty risk
  - C. Somewhat Counterparty risk exist
  - D. Not Applicable
8. In forward market there ----- exist.
- A. Counterparty risk
  - B. No Counterparty risk
  - C. Somewhat Counterparty risk exist
  - D. Not Applicable
9. Mark to Margin is the feature of
- A. Forward Contract
  - B. Future Contract
  - C. Real hybrid Contract
  - D. (d)Not Applicable
10. Daily settlement of gains and losses is done in contract. This is a feature of
- A. Forward Contract
  - B. Future Contract
  - C. Real hybrid Contract
  - D. Not Applicable
11. Settlement is done at the end of the contract. This is the feature of
- A. Forward Contract
  - B. Future Contract
  - C. Real hybrid Contract
  - D. Not Applicable
12. Spot Market is same as from derivative market.
- A. True

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B. False

13. A derivative is a financial instrument whose return is derived from the return on its other instrument.

A. True

B. False

14. Futures contracts allow fewer delivery options than forward contracts.

A. True

B. False

15. One of the primary functions of derivatives markets is price discovery.

A. True

B. False

**Answer for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. A  | 4. A  | 5. A  |
| 6. B  | 7. B  | 8. A  | 9. B  | 10. B |
| 11. B | 12. B | 13. A | 14. B | 15. A |

**Review Questions**

- 1) What do you mean by forward contract? Explain using suitable example.
- 2) What do you mean by future contract? Explain using suitable example.
- 3) Compare and contrast the forward and futures contracts.
- 4) Elaborate Currency futures. State the specification of future contract.
- 5) Elaborate the payoff of long and short future contract..

**Further Readings**

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<https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/currency-futures/>

## Unit 06: Management of Foreign Exchange Risk

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Objective

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6.2 Measurement of Exchange Rate Risk

6.3 Methods of Calculating Value at Risk (VaR)

6.4 Tools and Techniques of Foreign Exchange Risk Management

6.5 Types of Exposure

6.6 Impact of Currency Exposure on Company and Investors Performance

Summary

Keywords

Self Assessment

Answers for Self Assessment

Review Questions

Further Readings

### Objective

- understand the meaning and features of foreign exchange exposure.
- explore various tools and techniques to manage foreign exchange exposure.
- explore difference between transaction, economic and translation exposure.
- analyze currency exposure impact on global firms and investor performance

### Introduction

The liberalization of financial markets has enhanced corporate risk significantly. With the liberalization of the foreign exchange market, firms all over the world have aware of the fact that fluctuations in exchange rates expose their revenues, costs, operating cash flows and their market value to substantial fluctuations.

Firms which have exports and imports of goods and services, foreign currency borrowings and lending, foreign investments are directly exposed to currency fluctuations.

### 6.1 Foreign Exchange Exposure

Foreign Exchange Exposure refers to the risk associated with the foreign exchange rates that change frequently and can have an adverse effect on the financial transactions denominated in some foreign currency rather than the domestic currency of the company.

In other words, the firm's risk that its future cash flows get affected by the change in the value of the foreign currency, in which it has maintained its books of accounts to the volatility of the foreign exchange rates is termed as foreign exchange exposure.



Example: If an Indian firm imports goods and pays in foreign currency (say dollars), its outflow is in dollars, thus it is exposed to foreign exchange risk. If the value of the foreign currency rises (i.e., the dollar appreciates), the Indian firm has to pay more domestic currency to get the required amount of foreign currency.

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For example, if Indian company is competing against the products imported from China and if the Chinese Yuan per Indian rupee falls, then the importers enjoy decreased cost advantage over the Indian company. This shows, that companies not having any direct link to the forex do get affected by the change in the foreign currency.

These types of exposures are known as operating exposure, economic exposure, or strategic exposure. It measures the change in the present value of the firm resulting from any change in future operating cash flows of the firm caused by an unanticipated change in exchange rates.

Other kind of short-term exposure is known as Translation Exposure or Accounting Exposure. It is the potential for accounting derived changes in owner's equity to occur because of the need to "translate" foreign currency financial statements of foreign subsidiaries into a single reporting currency to prepare worldwide consolidated financial statements.

## **6.2 Measurement of Exchange Rate Risk**

After defining the types of exchange rate risk that a firm is exposed to, a crucial aspect of a firm's exchange rate risk management decisions is the measurement of these risks. Measuring currency risk may prove difficult, at least with regards to translation and economic risk. At present, a widely used method is the Value-at-risk (VaR) model.

Broadly, value at risk is defined as the maximum loss for a given exposure over a given time horizon with z% confidence.

**"What loss level is such that we are X% confident it will not be exceeded in N business days?"**

The VAR calculation depends on three parameters:

- The holding period, i.e., the length of time over which the foreign exchange position is planned to be held. The typical holding period is 1 day.
- The confidence level at which the estimate is planned to be made. The usual confidence levels are 99 percent and 95 percent.
- The unit of currency to be used for the denomination of the Value at risk.

The following are the advantages of Value at risk:

- It captures an important aspect of risk in a single number
- It is easy to understand.
- It asks the simple question: "How bad can things get?"

## **6.3 Methods of Calculating Value at Risk (VaR)**

The three main methods of calculating VAR. They are as follows:

**1. Analytical VAR:** This method uses the expected return and the standard deviation of the stocks in computing the VAR assuming that the returns of the subject asset/portfolio exhibit a 'Normal Distribution'. Basically, a level of confidence is selected, and the Z value is matched according to the selected probability.

Weaknesses: If there are far more outliers in the actual return distribution than would be expected given the normality assumption, the actual Value at Risk will be much higher than the computed Value at Risk.

A related problem occurs when the variances and covariance across assets change over time. This non-stationary in values is not uncommon because the fundamentals driving these numbers do change over time.

**2. Historical VAR:** This is probably the easiest way to calculate VAR.

All you have to do is collect the information regarding the historical returns of the asset, arrange all the historical returns in ascending order and then choose the percentile of the observations according to level of confidence required. The periodicity of the returns will define the time period of VAR.

### Unit 06: Management of Foreign Exchange Risk

Weaknesses: A related argument can be made about the way in which we compute Value at Risk, using historical data, where all data points are weighted equally. In other words, To the extent that there is a trend of increasing volatility even within the historical time period, we will understate the Value at Risk.

The historical simulation approach has the most difficulty dealing with new risks and assets for an obvious reason: there is no historic data available to compute the Value at Risk.

**3. Monte Carlo VAR:** In this method, software generates the distribution of the returns on a security/portfolio. This is done according to the input provided by the analyst regarding the historical return and standard deviation of the security. This method runs a lot of simulations to capture all the possibilities of the movement of the security.

Weaknesses: Every VaR measure makes assumptions about return distributions, which, if violated, result in incorrect estimates of the Value at Risk.

History may not be a good predictor and Non-Stationary predictions might occur.

Value at Risk (VAR) is an important risk measure used by the portfolio managers across the globe. Its ease of understanding and wide acceptance by the regulatory authorities makes it even more favorable for the fund management companies to adopt. Though its advantages clearly weigh more than the disadvantages, however one should consider its limitations while using it.

## **6.4 Tools and Techniques of Foreign Exchange Risk Management**

Exchange rate risk management is an integral part in every firm's decisions about foreign currency exposure. The need for currency risk management started to arise after the break down of the Bretton Woods system and the end of the U.S. dollar peg to gold in 1973.

Currency risk hedging strategies entail eliminating or reducing this risk, and require understanding of both the ways that the exchange rate risk could affect the operations of economic agents and techniques to deal with the consequent risk implications. Selecting the appropriate hedging strategy is often a daunting task due to the complexities involved in measuring accurately current risk exposure and deciding on the appropriate degree of risk exposure that ought to be covered.

### **Transaction Exposure**

Transaction exposure exists when short-term future cash transactions of a firm are affected by exchange rate fluctuations. When transaction exposure exists, the firm faces three major tasks:

- Identify its degree of transaction exposure.
- Decide whether to hedge this exposure.
- Choose a hedging technique if it decides to hedge part or all of the exposure.

**Managing Transaction Exposure:** Hedging techniques include:

- Futures hedge and Forward hedge,
- Money market hedge, and
- Currency option hedge.

MNCs will normally compare the cash flows that would be expected from each hedging technique before determining which technique to apply.

**Futures and Forward Hedges:** A futures hedge uses currency futures, while a forward hedge uses forward contracts, to lock in the future exchange rate. To hedge future payables (receivables), a firm may purchase (sell) currency futures, or negotiate a forward contract to purchase (sell) the currency forward. The hedge-versus-no-hedge decision can be made by comparing the known result of hedging to the possible results of remaining un-hedged and taking into consideration the firm's degree of risk aversion.

The real cost of hedging measures the additional expenses beyond those incurred without hedging.

Real cost of hedging payables (RCH p) = nominal cost of payables with hedging - nominal cost of payables without hedging.

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Real cost of hedging receivables (RCH r) = nominal revenues received without hedging - nominal revenues received with hedging.

If the real cost of hedging is negative, then hedging is more favorable than not hedging. To compute the expected value of the real cost of hedging, first develop a probability distribution for the future spot rate. Then use it to develop a probability distribution for the real cost of hedging.

**Money Market Hedge:** A money market hedge involves taking a money market position to cover a future payables or receivables position.

For payables: Borrow in the home currency (optional). Convert proceeds to foreign currency at the spot rate and invest in the foreign currency to pay off AP at maturity.

For receivables: Borrow in the foreign currency.

Convert amount to local currency at the spot rate and invest at home. At maturity pay off loan with foreign currency AR. If interest rate parity (IRP) holds, and transaction costs do not exist, a money market hedge will yield the same results as a forward hedge. This is so because the forward premium/discount on a forward rate reflects the interest rate differential between the two currencies.

**Currency Option Hedge:** A currency option hedge uses currency call or put options to hedge transaction exposure. Since options need not be exercised, they can insulate a firm from adverse exchange rate movements, and yet allow the firm to benefit from favorable movements. Currency options are also useful for hedging contingent exposure.

Alternative Hedging Techniques: Sometimes, a perfect hedge is not available (or is too expensive) to eliminate transaction exposure.

To reduce exposure under such conditions, the firm can consider:

- Leading and lagging,
- Cross-hedging, or
- Currency diversification

**Leading and Lagging:** Leading and lagging strategies involve adjusting the timing of a payment request or disbursement to reflect expectations about future currency movements. Expediting a payment is referred to as leading, while deferring a payment is termed lagging.

**Cross-Hedging:** When a currency cannot be hedged, another currency that can be hedged and is highly correlated may be hedged instead. The stronger the positive correlation between the two currencies, the more effective the cross hedging strategy will be.

**Currency Diversification:** An MNC may reduce its exposure to exchange rate movements when it diversifies its business among numerous countries. Currency diversification is more effective when the currencies are not highly positively correlated.

### **Transaction Exposure**

A firm has transaction exposure whenever it has contractual cash flows (receivables and payables) whose values are subject to unanticipated changes in exchange rates due to a contract being denominated in a foreign currency.

As firms negotiate contracts with set prices and delivery dates in the face of a volatile foreign exchange market with exchange rates constantly fluctuating, the firms face a risk of changes in the exchange rate between the foreign and domestic currency.

Transaction exposure measures gains or losses that arise from the settlement of existing financial obligation whose terms are stated in a foreign currency. Two steps are involved in measuring transactions exposure.

- Determine the projected net amount of currency inflows or outflows in each foreign currency; and
- Determine the overall exposure to those currencies.

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**Managing Transaction Exposure:** The various methods available to a firm to hedge its transaction exposure are:

- Forward Market Hedge
- Money Market Hedge
- Options Market Hedge
- Exposure Netting

### **Economic Exposure**

A firm has economic exposure (also known as operating exposure) to the degree that its market value is influenced by unexpected exchange rate fluctuations. Such exchange rate adjustments can severely affect the firm's market share position with regards to its competitors, the firm's future cash flows, and ultimately the firm's value.

Economic exposure can affect the present value of future cash flows. Any transaction that exposes the firm to foreign exchange risk also exposes the firm economically, but economic exposure can be caused by other business activities and investments which may not be mere international transactions, such as future cash flows from fixed assets.



Example: Here's a hypothetical example of economic exposure. Consider a large U.S. pharmaceutical with subsidiaries and operations in a number of countries around the world. The company's largest export markets are Europe and Japan, which together account for 40% of its annual revenues. Management had factored in an average decline of 3% for the dollar versus the euro and Japanese yen for the current year and next two years.

Their bearish view on the dollar was based on issues such as the recurring U.S. budget deadlock, as well as the nation's growing fiscal and current account deficits, which they expected would weigh on the greenback going forward.

However, a rapidly improving U.S. economy has triggered speculation that the Federal Reserve may be poised to tighten monetary policy much sooner than expected. The dollar has been rallying, as a result, and over the past few months has gained about 5% against the euro and yen.

The outlook for the next two years suggests further gains in store for the dollar, as monetary policy in Japan remains very stimulative and the European economy is just emerging out of recession.

The U.S. pharmaceutical company is faced not just with transaction exposure (because of its large export sales) and translation exposure (as it has subsidiaries worldwide), but also with economic exposure.

Recall that management had expected the dollar to decline about 3% annually against the euro and yen over a three-year period, but the greenback has already gained 5% versus these currencies, a variance of eight percentage points and growing. This will obviously have a negative effect on the company's sales and cash flows. Savvy investors have already cottoned on to the challenges facing the company due to these currency fluctuations and the stock has declined 7% in recent months.

A firm can assess its economic exposure by determining the sensitivity of its expenses and revenues to various possible exchange rate scenarios. The firm can then reduce its exposure by restructuring its operations to balance its exchange-rate-sensitive cash flows.

### **Managing Operating Exposure**

#### **Operational Strategies:**

- Diversifying production facilities and markets for products: Diversification would mitigate the risk inherent in having production facilities or sales concentrated in one or two markets. However, the drawback here is that the company may have to forgo economies of scale.
- Sourcing flexibility: Having alternative sources for key inputs makes strategic sense, in case the exchange rate moves make inputs too expensive from one region.
- Diversifying financing: Having access to capital markets in several major nations gives a company the flexibility to raise capital in the market with the cheapest cost of funds.

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**Currency Risk Mitigation Strategies:** The most common strategies in this regard are listed below.

- Matching currency flows: This is a simple concept that requires foreign currency inflows and outflows to be matched. For example, if a U.S. company has significant inflows in euros and is looking to raise debt, it should consider borrowing in euros.
- Currency risk-sharing agreements: This is a contractual arrangement in which the two parties involved in a sales or purchase contract agree to share the risk arising from exchange rate fluctuations. It involves a price adjustment clause, such that the base price of the transaction is adjusted if the rate fluctuates beyond a specified neutral band.
- Back-to-back loans: Also known as a credit swap, in this arrangement two companies located in different countries arrange to borrow each other's currency for a defined period, after which the borrowed amounts are repaid. As each company makes a loan in its home currency and receives equivalent collateral in a foreign currency, a back-to-back loan appears as both an asset and a liability on its balance sheets.
- Currency swaps: This is a popular strategy that is similar to a back-to-back loan but does not appear on the balance sheet. In a currency swap, two firms borrow in the markets and currencies where each can get the best rates, and then swap the proceeds.

### **Translation Exposure**

A firm's translation exposure is the extent to which its financial reporting is affected by exchange rate movements. As all firms generally must prepare consolidated financial statements for reporting purposes, the consolidation process for multinationals entails translating foreign assets and liabilities or the financial statements of foreign subsidiary subsidiaries from foreign to domestic currency.

While translation exposure may not affect a firm's cash flows, it could have a significant impact on a firm's reported earnings and therefore its stock price. Translation exposure is distinguished from transaction risk as a result of income and losses from various types of risk having different accounting treatments.



Example: An Austrian subsidiary of an American company purchases a building worth €100,000 on September 1, 2019. On this date, the euro-dollar exchange rate is €1 = \$1.20, so the value of the building converted into dollars is \$120,000.

The company decides to convert all of its foreign holdings into dollars, to present a consolidated balance sheet on March 31, 2020. On that day, the exchange rate changes to €1 = \$1.15, so the value of the building falls to \$115,000.

Similarly, if FMCG major Unilever reports a consolidated financial statement for its US, UK, and Europe subsidiary, it will face translation risk.

The major differences between operation/economic exposure and translation exposure are:-

- Translation exposure arises only when a firm has a foreign subsidiary or foreign operation. But economic exposure arises even when a company is purely domestic company.
- Economic exposure measures the impact of exchange rate on all future cash flow while translation exposure arises only when consolidated account statements are prepared. Hence economic exposure is a forward looking concept while translation exposure is backward looking i.e. past performance of the subsidiary is translated as per the parent's reporting currency.
- Economic exposure affects actual cash flow of the company while translation exposure results in translation gain or loss – mere accounting entry.



## 6.5 Types of Exposure

Assets and liabilities are to be translated at the current rate that is the rate prevailing at the time of preparation of consolidated statements.

All revenues and expenses are to be translated at the actual exchange rates prevailing on the date of transactions. For items occurring numerous times weighted averages for exchange rates can be used.

Translation adjustments (gains or losses) are not to be charged to the net income of the reporting company.

Translation Methods

Current/Non-current method: Under this, current assets and liabilities are valued at current rate & non-current assets and liabilities at historical rate.

Monetary/Non-monetary method: Under this method, all monetary items are valued at current rates and non-monetary items at historical rates.

Temporal method: Under this method the inventory and investments are translated at current rate if they are valued at the market price.

Current rates: Under this method all assets, liabilities, income & expenses are translated at current rates of exchange.

### Managing Techniques

**Balance sheet hedge:** This consists of bringing about a balance between the net exposed assets and liabilities, so that the net exposure is 0. If exposed assets are more than exposed liabilities, the exposure can be made zero by increasing the liability. Similarly, if liabilities are more than assets we make more purchases of assets.

**Exposure netting:** An MNC may see to that the positive exposure by a negative exposure in the same or similarly placed currencies (i.e., with appreciating or depreciating currency). They cannot be balanced by crossing currencies.

### Leading & lagging:

Assets > Liabilities Foreign currency appreciated LEAD

Assets < Liabilities Foreign currency depreciated LAG

**Forward contract:** A company with a positive exposure (assets more than liabilities) will sell forward the exposed currency to balance the net effect on balance sheet. A company with a negative exposure (liabilities more than assets) will purchase forward the currency to get the same result.

## 6.6 Impact of Currency Exposure on Company and Investors Performance

Exchange rates impact companies worldwide. This risk also impact investors. For instance, investors in automaker Toyota Motor Corp. (TM) have currency exposure because the company sells cars in countries outside of Japan. Toyota sells cars in the United States for U.S. dollars, in France for euros, and in Britain for pounds. After receiving these foreign currencies, Toyota converts the currencies back to the domestic currency (yen). Changing exchange rates influence the value of the currency that Toyota receives when it is converted back to yen. In turn, investors in Toyota are impacted by this activity.

Investors also have currency exposure because of the transaction risk faced by companies involved in international trade. This is the risk that currency exchange rates will change after financial obligations have already been settled. The currency exposure of an asset, such as stocks, is the sensitivity of that asset's return measured in the investor's domestic currency to fluctuations in exchange rates.

### Managing Currency Exposure in Your Portfolio

The value of investments is significantly impacted by changes in global currency exchange rates. Investors should appreciate the influence that the foreign exchange market has on the assets they own and their level of currency exposure.

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### How Does Currency Impact Investment Returns?

To put it simply: International return = [equity return] + [currency return]

It is important to note that currencies and financial assets do not always move in the same direction. For example: Sometimes currencies may have positive correlation to equities or bonds, so they both move up at the same time. At other times, currencies and markets move in different directions, so when equities or bonds are up, the currency may be down and vice versa.

This means currency can be the tailwind that helps to push an investment's return higher or the headwind that drags the returns down. This means currency can be the tailwind that helps to push an investment's return higher or the headwind that drags the returns down.

### Stock Price Performance and Exchange Rate Fluctuations

All these forex influences on a company's operating performance will, of course, have a knock-on effect on its stock prices. Most investors are impacted by these currency changes via stocks (although other assets, including fixed income, commodities, and alternative assets are influenced by changes in global exchange rates). There are three general correlations between stock price performance and exchange rate fluctuations: zero correlation, negative correlation, and positive correlation.

- Zero correlation - When there is no reaction by stock price to changes in exchange rates, there is zero correlation. An example of zero correlation is if the stock price of the U.S. electronics device producer Apple Inc. (AAPL) does not change while the U.S. dollar falls 1% in value.
- Negative correlation - A negative correlation exists when a stock price increases as the local currency depreciates. An example of negative correlation is if the stock price of German pharmaceutical-maker Bayer AG rises with a depreciation of the euro.
- Positive correlation - A positive correlation exists when a stock price decreases while the local currency depreciates. An example of a positive correlation is if the stock price of Toyota were to decrease with a depreciation of the yen.

Correlations can help investors conduct a more comprehensive evaluation of an investment.



Suppose an investor forecasts that the euro will decline in value versus a basket of currencies. Weakness in the euro would be beneficial if Bayer AG has a negative correlation. As the euro declines in value, Bayer's stock price would increase. It is important to realize those correlations are purely empirical observations of the relationship between stock prices and currency exchange rates. The net impact of currency fluctuations can be more complicated.

If the U.S. dollar loses value and the American restaurant chain McDonald's Corp. (MCD) has a negative correlation, the stock price may rise. However, oil and other natural resources used in the production process will, in all likelihood, become more expensive. That would have a negative effect on the company's operating performance in the future and would alter the net result of the currency impact.

### How Does Currency Impact Companies?

If a currency depreciates, it is beneficial for exporters, and negatively impacts importers. Alternatively, if a currency appreciates, exporters are negatively impacted and importers benefit. Let's illustrate the impact of a weaker domestic currency on product prices with an example.



Assume that the Canadian dollar (C\$) declines by 10 percent against the U.S. dollar (US\$) over the period of a year, from a rate of 90 U.S. cents per C\$ (US\$1 = C\$ 1.1110) to 81 U.S. cents (US\$1 = C\$1.2350).

What would be the price change in Canadian supermarkets for a pound of California almonds that are available in the U.S. for US\$. All else being equal (assuming no other costs and only taking exchange rates into account), the price of California almonds in Canada would increase from about C\$7.78 (i.e., approx. US\$7 × 1.1110) to C\$8.65 (US\$7 × 1.2350) per pound.

### Exchange Rates and Inflation & Interest Rates

A weak domestic currency can push up the inflation rate in a nation that is a big importer, because of higher prices for foreign products. This may induce the central bank to raise interest rates to

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counter inflation, as well as to support the currency and prevent it from plunging sharply. Conversely, a strong currency depresses inflation and exerts a drag on the economy that is tantamount to tight monetary policy. In response, a nation's central bank may move to keep interest rates low or reduce them further so as to preclude the domestic currency from getting too strong.

#### **Exchange Rates and FDI**

When the exchange rate weakens, it makes the domestic currency cheaper to other nations. So, a fluctuation that weakens the currency makes it cheaper for other nations to invest. For instance, if the US dollar weakens against the Chinese Yuan, it means US consumers will receive fewer goods in exchange for their money. As a result, an investor from China will find it cheaper to invest in the US.

Euro strengthens significantly against the dollar between 2002 and 2008. At the same time, the US was also losing value against other currencies. What happened was that Foreign Direct Investment became cheaper for international companies and had a direct positive effect on investment. With that said, the exchange rate is not the only factor in FDI, but one contributory factor. So, although the exchange rate can influence it, it is not necessarily the sole cause.

#### **Exchange Rates and the Job Market**

A weak domestic currency spurs economic growth by boosting exports and making imports more expensive (forcing consumers to buy domestic goods). Faster economic growth usually translates into better employment prospects.

A strong domestic currency can have the opposite effect, as it slows economic growth and curtails employment prospects.

#### **Exchange Rates and Real Estate**

A weak or undervalued domestic currency can be like having open-ended Black Friday sale and what is marked down is every single good, service, and asset in the country.

The trick is, only buyers who can pay in the stronger foreign currency get the sale price. This attracts foreign tourists, which can be good for the economy. However, it also attracts foreign buyers looking to scoop up cheap assets and outbidding domestic buyers for them.

International investments are a smart way to diversify and should be a part of every portfolio. It is important, however, to understand that these investments come with additional risks, making it critical for investors to select managers with deep experience navigating international markets. Diversification does not guarantee a profit or protect against a loss in declining markets. Investments in international securities are subject to certain risks of overseas investing including currency fluctuations and changes in political and economic conditions, which could result in significant market fluctuations..

Just like an iceberg, the major impact of exchange rates fluctuations lie largely beneath the surface. The indirect effect of currency fluctuations dwarfs the direct effect because of the huge influence it exerts on the economy in both the near term and long term. The indirect effect of exchange rates extends to the prices you pay at the supermarket, the interest rates on your loans and savings, the returns on your investment portfolio, your job prospects, and possibly even on housing prices in your area.

### **Summary**

Foreign Exchange Exposure refers to the risk associated with the foreign exchange rates that change frequently and can have an adverse effect on the financial transactions denominated in some foreign currency rather than the domestic currency of the company. Measuring currency risk may prove difficult, at least with regard to translation and economic risk. At present, a widely used method is the Value-at-risk model.

There are three types of exposure which are transaction exposure, economic exposure and translation exposure. Firm uses various types of techniques to hedge against these exposures.

Currency exposure impacts the firm's performance as well as the return of the investors. It affects interest rates, investment, job market, inflation and also the real estate market.

**Keywords**

Value at risk: It is defined as the maximum loss for a given exposure over a given time horizon with particular confidence level.

Currency risk-sharing agreements: It is an arrangement in which the two parties involved in a sales or purchase contract agree to share the risk arising from exchange rate fluctuations.

Translation exposure: A firm's translation exposure is the extent to which its financial reporting is affected by exchange rate movements.

Economic exposure: A firm has economic exposure to the degree that its market value is influenced by unexpected exchange rate fluctuations.

Transaction exposure: A firm has transaction exposure whenever it has contractual cash flows (receivables and payables) whose values are subject to unanticipated changes in exchange rates due to a contract being denominated in a foreign currency.

Money market hedge: It is a hedge which involves taking a money market position to cover a future payables or receivables position.

**Self Assessment**

1. -----exposure measures gains or losses that arise from the settlement of existing financial obligation whose terms are stated in a foreign currency.
  - A. Transaction exposure
  - B. Economic exposure
  - C. Translation exposure
  - D. Not Applicable
  
2. A firm has ----- to the degree that its market value is influenced by unexpected exchange rate fluctuations.
  - A. Transaction exposure
  - B. Economic exposure
  - C. Translation exposure
  - D. Not Applicable
  
3. A firm has ----- as a paper gain and loss.
  - A. Transaction exposure
  - B. Economic exposure
  - C. Translation exposure
  - D. Not Applicable
  
4. VaR stands for
  - A. Value at risk
  - B. War at risk
  - C. Both of the above
  - D. None of the above
  
5. If a currency depreciates, it is beneficial for -----
  - A. Exporters

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- B. Imports  
 C. Both of the above  
 D. None of the above
6. If a currency depreciates, it is beneficial for -----
- A. Exporters  
 B. Imports  
 C. Both of the above  
 D. None of the above
7. A weak domestic currency can push ----- the inflation rate in a nation that is a big importer, because of higher prices for foreign products. .
- A. Up  
 B. Down  
 C. Does not effect  
 D. Not Applicable
8. Diversification ----- guarantee a profit or protect against a loss in declining markets.
- A. Does not  
 B. Does  
 C. Not impact at all  
 D. Not Applicable
9. International return = [equity return] + [currency return]
- A. True  
 B. False  
 C. All facts are not given  
 D. Not Applicable
10. - A negative correlation exists when a stock price increases as the local currency -----  
 -----.
- A. Depreciates  
 B. Appreciates  
 C. Neither appreciates or depreciates  
 D. Not Applicable
11. When the exchange rate weakens, it makes the domestic currency ----- to other nations.
- A. Cheaper  
 B. Expensive  
 C. Does not effect  
 D. Not Applicable

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12. Value at risk is defined as the minimum loss for a given exposure over a given time horizon with z% confidence.
- A. True  
B. False
13. Economic exposure can affect the present value of future cash flows.
- A. True  
B. False
14. While translation exposure may not affect a firm's cash flows, it could have a significant impact on a firm's reported earnings and therefore its stock price.
- A. True  
B. False
15. Currency diversification is more effective when the currencies are not highly positively correlated.
- A. True  
B. False

**Answers for Self Assessment**

1. A      2. B      3. C      4. A      5. A  
6. B      7. B      8. A      9. A      10. A  
11. A      12. B      13. A      14. A      15. A

**Review Questions**

- 1) What is economic exposure? How do you measure it?
- 2) Compare the three types of exposure: translation, transaction and economic.
- 3) How can you manage economic exposure? Give the marketing and production initiatives of managing economic exposure.
- 4) How do currency fluctuation impact investors returns and company performance?
- 5) Elaborate various hedging techniques used for Economic exposure.



**Further Readings**

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**Web Links**

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<https://corporatefinanceinstitute.com/resources/knowledge/accounting/translation-exposure/>

<https://efinancemanagement.com/international-financial-management/economic-exposure>

[corporatefinanceinstitute.com/resources/knowledge/trading-investing/value-at-risk-var/](https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/value-at-risk-var/)

**Unit 07: International Financial Markets and Portfolio Investment****CONTENTS**

Objective

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- 7.3 Optimal International Portfolio Selection
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Summary

Keywords

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**Objective**

- understand diversification and its effects,
- analyze International correlation structure.
- understand optimal portfolio selection in International market,
- analyze impact of exchange rate movement in portfolio return.

**Introduction:**

International financial markets in today's dynamic environment have a huge impact on domestic environment. The correlation between the domestic market and international market is different. So investing in a market with no correlation can increase my portfolio returns.

**7.1 Portfolio Management and Diversification**

**Portfolio Management:** Portfolio is basket or combination of securities. Planning one's portfolio as per risk return profile & managing it efficiently so as to secure highest return for lowest risk at a particular level of investment is called Portfolio Management. It is a dynamic concept and requires continuous, systematic analysis, judgment and operations.

**Diversification & Its Effects:** Principal of allocating funds among several eligible securities is known as diversification.

**Effects of diversification:**

- It helps in reducing risk.
- All securities do not move exactly together.
- Variability in one will be offset by reverse variability in other.



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**Types of Diversification:** Diversification is of two types-

- (a) Naïve or simple diversification.
- (b) Markowitz diversification
- (a) Naïve or simple diversification:** It is simply increasing company or Industries in the portfolio to reduce statistical error of choosing wrong company. But it also has some limitations like-
  - Purchase of bad stocks.
  - Difficulty in obtaining information.
  - Increased transaction cost.
  - Increased research cost.
- (b) Markowitz diversification-**Modern portfolio theory was initiated by University of Chicago graduate student, Harry Markowitz in 1952. Markowitz showed how the risk of a portfolio is a function of the degree of co- movement of the returns of those individual assets. The important points of Markowitz are-
  - There should be right number and right kind of securities which are negatively correlated or not correlated at all.
  - Unsystematic risk is reduced to optimum level or even can be reduced to zero, if 10-15 stocks are added to one's portfolio.
  - By combining negatively correlated securities variability of return of risk can be reduced.

The correlation coefficient between the returns on two securities will lie in the range of +1 through - 1.

- +1 which is perfect positive correlation.
- -1 which is perfect negative correlations.

The lower the correlation, the more risk reduction (diversification) you will achieve.

- Perfect positive correlation will lead to no diversification
- Positive correlation will lead to weak diversification.
- No correlation will lead to some diversification potential.
- Perfect Negative correlation will lead to greater diversification potential.

In fact, negative correlation will lead to greatest diversification potential. The return of two assets is dependent on the degree of co movement of two stocks which is measured by the correlation coefficient. The lower the correlation, the more risk reduction (diversification) you will achieve.

## **7.2 International Correlation Structure and Risk Diversification**

Security returns are much less correlated across countries than within a country. This is due to the following reasons-

- This is so because economic, political, institutional, and even psychological factors affecting security returns tend to vary across countries, resulting in low correlations among international securities.
- Business cycles are often highly asynchronous across countries.

So relatively low international correlations imply that investors should be able to reduce portfolio risk more if they diversify internationally rather than domestically.

**Domestic vs. International Diversification:** When fully diversified, an international portfolio can be less than half as risky as a purely U.S. portfolio. A fully diversified international portfolio is only 12 percent as risky as holding a single security.

**Home Bias in Portfolio Holdings:** Home bias refers to the extent to which portfolio investments are concentrated in domestic equities.

**Why home bias in Portfolio Holdings?**

Three explanations for home bias are

1. Domestic equities may provide a superior inflation hedge.
2. Home bias may reflect institutional and legal restrictions on foreign investment.
3. Extra taxes and transactions/information costs for foreign securities may give rise to home bias.

**7.3 Optimal International Portfolio Selection**

In order to select optimal portfolio correlation of different markets have to be seen.



Example: Let's suppose the correlation of the U.S. stock market with the returns on the stock markets in other nations varies.

- The correlation of the U.S. stock market with the Canadian stock market is 70%.
- The correlation of the U.S. stock market with the Japanese stock market is 24%.

A U.S. investor would get more diversification from investments in Japan than Canada.

**Problem 1:**

Stock market	Return (mean)	Risk (SD)
United States	1.26% per month	4.43%
United Kingdom	1.23% per month	5.55%

The correlation coefficient between the two markets is 0.58. Suppose that you invest equally, i.e., 50% each, in the two markets. Determine the expected return and standard deviation risk of the resulting international portfolio.

**Solution**

The expected return of the equally weighted portfolio is:  $E(R_p) = (.5)(1.26\%) + (.5)(1.23\%) = 1.25\%$

The variance of the portfolio is:

$$\text{Var}(R_p) = (.5)^2(4.43)^2 + (.5)^2(5.55)^2 + 2(.5)^2(4.43)(5.55)(.58)$$

$$\sigma_p = \sqrt{w_1^2 \sigma_1^2 + w_2^2 \sigma_2^2 + 2r_{1,2} \sigma_1 \sigma_2 w_1 w_2}$$

$$= 4.91 + 7.70 + 7.13 = 19.74$$

The standard deviation of the portfolio is thus 4.44%.

**Problem**

Stock market	Return (mean)	Risk (SD)
United States	14%	15%
Germany	18%	20%

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The correlation coefficient between the two markets is 0.34. Suppose that you invest equally, i.e., 40% in US and 60% in Germany the two markets. Determine the expected return and standard deviation risk of the resulting international portfolio.

**Solution**

The expected return of the equally weighted portfolio is:

$$E(R_p) = (.4)(14\%) + (.6)(18\%) = .164 = 16.4\%$$

The variance of the portfolio is:

$$\text{Var}(R_p) = (.4)^2(15\%)^2 + (.6)^2(18\%)^2 + 2(.4)(.6)(15\%)(18\%)(.34)w_1w_2$$

The standard deviation of the portfolio is thus 15.1%.

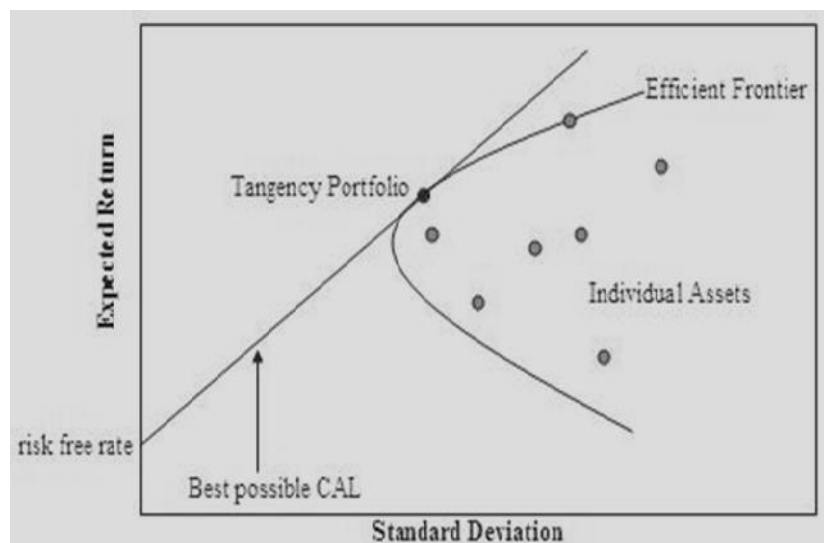
**Summary Statistics for Monthly Returns 1980-2001 (\$U.S.)**

Stock Market	Correlation Coefficient					Mean (%)	SD (%)	$\beta$
	CN	FR	GM	JP	UK			
Canada (CN)						.88	5.78	0.99
France (FR)	0.46					1.19	6.29	1.00
Germany (GM)	0.42	0.69				1.09	6.26	0.91
Japan (JP)	0.33	0.41	0.33			0.91	6.99	1.20
United Kingdom	0.57	0.57	0.50	0.42		1.23	5.55	0.98
United States	0.74	0.50	0.45	0.31	0.58	1.26	4.43	0.86

This table clearly shows that the Japanese market is more sensitive to the world market than in U.S.

**7.4 The Efficient Frontier**

The efficient frontier implies that an asset or portfolio of asset are efficient when it is having no other asset or portfolio of assets offers higher expected return with the same (or lower) risk, or lower risk with the same (or higher) expected return. These composite assets constitute the efficient frontier.



The investor will choose the efficient frontier on the basis of his tradeoff between expected return and risk. This trade off will determine the portfolio selection the investor will make which will lie on the point of highest utility the investor will get.

## 7.5 Effects of Changes in the Exchange Rate

The realized return of the investor depends upon not only the return of the investor but also on the movement of exchange rates. So we can say that U.S. resident investing in a foreign market will depend not only on the return in the foreign market but also on the change in the exchange rate between the U.S. dollar and the foreign currency.

This return will be given by-

- $R_{i\$} = (1 + R_i)(1 + e_i) - 1$
- $= R_i + e_i + R_i e_i$

Where

- $R_i$  is the local currency return in the  $i$ th market
- $e_i$  is the rate of change in the exchange rate between the local currency and the dollar



Example: If a U.S. resident just sold shares in a British firm that had a 15% return (in pounds) during a period when the pound depreciated 5%, his dollar returns is 9.25%:

- $R_{i\$} = (1 + .15)(1 - 0.05) - 1 = 0.925$
- $= .15 + -.05 + .15 \times (-.05) = 0.925$

## 7.6 Depository receipts:

A depository receipt is a negotiable certificate representing shares in a foreign company traded on a local stock exchange. They are represented by a physical certificate and traded on national stock exchanges. The DR is created when a foreign company wishes to list its already publicly traded shares or debt securities on a foreign stock exchange. Before it can be listed on a particular stock exchange, the company in question must first meet requirements put forth by the exchange. Depository receipts can also be issued as part of an initial public offer. They may also trade over the counter.

**Benefits of Depository Receipt to Investors:** Investor gets benefit of-

- Depository receipts allow investors to hold equity shares of foreign companies without the need to trade directly in a foreign market.
- Depository receipts allow investors to diversify their portfolios by purchasing shares of companies in different markets and economies.
- Depository receipts are more convenient and less expensive than buying stocks in foreign markets directly.

**Benefits of Depository Receipt to Companies:** A company may issue DRs for a number of reasons-

- To raise capital in foreign markets.
- To increase consumer interest in their products by strengthening name recognition in foreign markets.
- To potentially increase the liquidity of their shares by broadening the shareholder base (DRs facilitate cross border trading).

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- To gain visibility through financial market presence, which can generate support for and interest in potential mergers and acquisitions?
- To allow employees outside the home market to participate in the parent company.

**American depository receipts:** ADR is a dollar-denominated negotiable certificate. It represents a non-US company's publicly traded equity. ADRs allowed companies domiciled outside of the United States to tap the United States capital markets. It was devised in the late 1920s to help Americans invest in overseas securities and to assist non-US companies wishing to have their stock traded in the American Markets.

#### **Levels of ADR**

- **Level 1-** Level 1 depository receipts are the lowest level of sponsored ADRs that can be issued. When a company issues sponsored ADRs, it has one designated depository who also acts as its transfer agent.
- **Level 2-** Level 2 depository receipt programs are more complicated for a foreign company. In the Level 2 the company can list the share on a U.S. stock exchange.
- **Level 3-** A Level 3 American Depository Receipt program is the highest level a foreign company can sponsor. Because of this distinction, the company is required to adhere to stricter rules that are similar to those followed by U.S. companies.

#### **Advantages of ADR**

- It is an easy and cost-effective way to buy shares in a foreign company.
- Reduces administrative costs and avoids foreign taxes on every transaction.
- Helps companies that are listed to tap the American equity markets.
- Any foreigner can purchase these securities.
- The purchaser has a theoretical right to exchange shares (non- voting right shares for voting rights).

**Global Depository Receipt – GDR:** A global depository receipt (GDR) is similar to an ADR, but is a depository receipt sold outside of the United States and outside of the home country of the issuing company. GDRs represent ownership of an underlying number of shares of a foreign company and are commonly used to invest in companies from developing. GDRs enable a company, the issuer, to access investors in capital markets outside of its home country. The GDRs are issued in the currency of the country where the stock is traded.

#### **Advantages of GDR to the issuing company**

- Accessibility to foreign capital markets.
- Increase in the visibility of the issuing company.
- Rise in capital because of foreign investors.

#### **Advantages of GDR to investor**

- Helps in diversification, hence reducing risk.
- More transparency since competitor's securities can be compared.
- Prompt dividend and capital gain payments.

#### **ADR versus GDR**

- Global depository receipt (GDR) is compulsory for foreign company to access in any other country's share market for dealing in stock. But American depository receipt (ADR) is compulsory for non -us companies to trade in stock market of USA.

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- ADRs can get from level -I to level -III. GDRs are already equal to high preference receipt at level -II and level -III.
- ADRs up to level -I need to accept only general condition of SEC of USA, but GDRs can only be issued under rule 144 A after accepting strict rules of SEC of USA.
- GDR is a negotiable instrument all over the world, but ADR is only negotiable in the USA.

## 7.7 Bond Market

The bond market is a financial market where participants buy and sell debt securities, usually in the form of bonds. The bond market primarily includes: Government-issued securities and corporate debt securities. It is debt security, under which the issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay them interest (the coupon) and/or to repay the principal at a later date, termed the maturity date.

### Key Features of a Bond

Par value – Nominal, principal, par or face amount is the amount on which the issuer pays interest, and which, most commonly, has to be repaid at the end of the term.

Coupon interest rate – stated interest rate (generally fixed) paid by the issuer. Multiply by par value to get payment of interest.

Maturity date – years until the bond must be repaid.

Issue date – when the bond was issued.

Yield to maturity - rate of return earned on a bond held until maturity (also called the “promised yield”).

A bond issued in a country or currency other than that of the investor or broker.

### Features of international bond

- 1) It is a debt market
- 2) It is a fund raising market
- 3) Fixed income instrument
- 4) Issued in foreign currency
- 5) It channelizing savings

**Euro Bonds:** The word Eurobond was originally created by Julius Strauss. The first European Eurobonds were issued in 1963. The currency in which Eurobonds are issued determines its name like Euro yen, which are issued in Yen, the currency of Japan and Eurodollar, which are issued in US dollars, the currency of United States. Euro yen bonds are issued in any other country except Japan and are aimed at borrowing Yen from outside. Similarly, Eurodollar bonds are not issued in United States. It may be issued in say, London, for example, by a company to borrow dollars.



Example: Let's assume Company XYZ is headquartered in the United States. Company XYZ decides to go to Australia to issue bonds denominated in Canadian dollars. This is an example of a euro bond. In many cases, an issuer sells its euro bonds in a number of international markets.

### Fixed rate of interest V/S Floating rate of interest

Eurobonds come with a fixed rate of interest or floating rate of interest.

- **Fixed rate of interest:** In such Eurobonds, rate of interest remains the same throughout the duration of the bond. Such types of bonds have higher interest rate risk because even if the

### *International Financial management*

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interest prevailing in the market is high, the holder of such a bond would continue to get the rate between the issuer and the investor.

- **Floating rate of interest:** In such Eurobonds, the interest or coupons paid annually to the investors varies from year to year. If the interest rate prevailing in the market is high, the investor will get more interest and if the interest rate is less, he will get less interest. Bonds that have a floating rate of interest have lesser degree of risk as far as interest rate is concerned.

#### **Foreign Bonds**

A foreign bond is a bond issued in a domestic market by a foreign entity in the domestic market's currency as a means of raising capital. Domestic investors can diversify internationally by owning foreign bonds, and since they are traded on local exchanges are easier to acquire.



Example:

A Matilda bond is a bond issued in the Australian market by a non-Australian company.

A samurai bond is a corporate bond issued in Japan by a non-Japanese company.

#### **Multi-Currency Bonds**

A dual currency bond is a kind of debt instrument where the coupon payment is denominated in one currency and the principal amount in another and can expose the holder to exchange rate risk. Dual currency bond issues are most commonly initiated by multinational corporations and traders on the euro-bond market.

The two most common types of dual currency bonds are:

- **Traditional dual currency bonds** – The interest is paid in the domestic currency of the investor and the principal amount is denominated in the issuer's domestic currency.
- **Reverse dual currency bonds** – The interest is paid in the domestic currency of the issuer and the principal amount is denominated in the investor's domestic currency.



Example: Assume a bond is issued with a par value of \$1,000 and has a maturity date of one year. Interest is to be paid in U.S. dollars and the principal repayment at maturity will be in euros

#### **Distinguish between a foreign bond, Eurobond, and multi-currency bond**

These three types of international bonds differ either in their mix of currencies or in the difference between their currency and the currency of the country in which they are initially sold. More specifically:

- A foreign bond is a bond issued by a foreign borrower in the currency of the country of issue (for example, the Swiss pharmaceutical company Bayer issuing a U.S. dollar denominated bond in the United States).
- A Eurobond is a bond denominated in a currency other than that of the country of issue (for example, Proctor & Gamble issuing a U.S. dollar denominated bond in Germany). Eurobonds also have the advantages of limited regulation and recordkeeping and no tax withholding requirements, which further lower the interest rate required by investors.
- A multi-currency bond is a bond denominated in more than one currency (for example, Toyota issuing a bond promising interest payments in yen and the repayment of principal in U.S. dollars).

## Summary

Portfolio management is a combination of securities for reducing risk and maximizing returns. Modern portfolio theory states that by combining securities which are negatively correlated one can reduce risk.

International portfolio diversification will reduce more risk than domestic level as both is less correlated. Optimum portfolio can be made by seeing that two securities are less correlated. The portfolio for international diversification includes depository receipts, euro bond, foreign bond and multicurrency bond.

## Keywords

**Home bias:** It refers to the extent to which portfolio investments are concentrated in domestic equities.

**Depository receipt:** A depository receipt is a negotiable certificate representing shares in a foreign company traded on a local stock exchange.

**Foreign bond:** A foreign bond is a bond issued in a domestic market by a foreign entity in the domestic market's currency as a means of raising capital.

**Bond:** It is debt security, under which the issuer owes the holders a debt and, depending on the terms of the bond, is obliged to pay them interest and the principal at a later date, termed the maturity date.

**American depository receipts:** It is a dollar-denominated negotiable certificate which represents a non-US company's publicly traded equity.

**Markowitz diversification:** It states that by combining two securities which are negatively correlated the risk reduction can be done at maximum level.

## Self Assessment

1. Security returns are much less correlated across countries than within a country.

- A. True
- B. False
- C. Depends
- D. Not applicable

2. Basic objective of diversification is

- A. Increasing Return
- B. Maximizing Return
- C. Decreasing Risk
- D. Maximizing Risk.

3. Allocation of fund to various eligible assets is known as-----,

- A. Diversification
- B. Allocation
- C. Correlation
- D. None

4. Perfect positive correlation will lead to -----

- A. No diversification
- B. Greatest diversification potential



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- C. Both of the above  
D. None of the above
5. Perfect negative correlation will lead to-----
- A. No diversification  
B. Greatest diversification potential  
C. Both of the above  
D. None of the above
6. Securities from a same country are subject to the same business cycle and macroeconomic policies, thus causing ----- correlations among their returns.
- A. High  
B. Low  
C. Equal  
D. None of the above
7. Securities from a same country are subject to the same business cycle and macroeconomic policies, thus causing ----- potential for diversification.
- A. High  
B. Low  
C. Equal  
D. None of the above
8. Relatively low international correlations imply that investors should be able to -----  
---portfolio risk more if they diversify internationally rather than domestically.
- A. High  
B. Low  
C. Equal  
D. None of the above
9. The correlation of the U.S. stock market with the Canadian stock market is 70%. The correlation of the U.S. stock market with the Japanese stock market is 24%. A U.S. investor would get ----- diversification from investments in Japan than Canada.
- A. More  
B. Less  
C. Not impact at all  
D. Not Applicable
10. ----- ADRs to domestic portfolios has a substantial risk reduction benefit.
- A. Adding  
B. Subtracting  
C. All facts are not given  
D. Doing nothing

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11. Domestic equities may provide an ----- inflation hedge.
- Inferior
  - Superior
  - No Impact
  - Not Applicable
12. The potential of an asset to diversify a portfolio is dependent upon the degree of co-movement of returns of the asset with those other assets that make up the portfolio.
- True
  - False
13. Level 1 depository receipts are the highest level of sponsored ADRs that can be issued.
- True
  - False
14. A foreign bond is a bond issued in a domestic market by a foreign entity in the domestic market's currency as a means of raising capital.
- True
  - False
15. A multi-currency bond is a bond denominated in more than one currency.
- True
  - False

### **Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. C  | 3. A  | 4. A  | 5. B  |
| 6. A  | 7. B  | 8. A  | 9. A  | 10. A |
| 11. B | 12. A | 13. B | 14. A | 15. A |

### **Review Questions**

- What do you mean by portfolio management?
- Elaborate in brief about traditional and Markowitz diversification.
- Distinguish between American depository receipt and Global depository receipt.
- Elaborate key features of International bond market.
- Distinguish between a foreign bond, Eurobond, and multi-currency bond.



### **Further Readings**

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**Web Links**

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<https://www.guidedchoice.com/video/dr-harry-markowitz-father-of-modern-portfolio-theory/><https://www.investopedia.com/terms/i/international-portfolio.asp>

<https://corporatefinanceinstitute.com/resources/knowledge/finance/international-bonds/>

## Unit 08: Capital Structure of the Multinational Firm

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### Objective

- understand International capital structure.
- assess multinational corporation capital structure decision.
- Identifying options of parent firm for subsidiary capital structure.
- assess factors affecting choice of markets in International trade.

### Introduction

Capital structure of the company determines risk and cost for the organization. Debt and equity in capital structure is having its own benefits and cost. International capital structure also gives benefits of segmented.

### **8.1 International Capital Structure**

Many major firms throughout the world have begun to internationalize their capital structure by raising funds from foreign as well as domestic sources. As a result, these corporations are becoming multinational not only in the scope of their business activities but also in their capital structure.



Example: IBM, Honda Motor, and British Petroleum are simultaneously listed and traded on the New York, London, and Tokyo stock exchanges.

#### **Benefits of International Capital Structure**

- By internationalizing its corporate ownership structure, a firm can generally increase its share price and lower its cost of capital.

- Cross-listing of a firm's shares on foreign stock exchanges is one way a firm operating in a segmented capital market can lessen the negative effects of segmentation and also internationalize the firm's capital structure.

### Meaning of Capital structure

Capital structure is the proportion of debt, preference and equity shares on a firm's balance sheet.

According to Gerstenberg,

“Capital structure of a company refers to the composition or make-up of its capitalization and it includes all long term capital resources viz loans, reserves, shares and bonds”.

- Debt consists of borrowed money that is due back to the lender, commonly with interest expense.
- Equity consists of ownership rights in the company, without the need to pay back any investment.

Companies benefit from debt because of its tax advantages; interest payments made as a result of borrowing funds may be tax-deductible. Debt also allows a company or business to retain ownership, unlike equity. Additionally, in times of low interest rates, debt is abundant and easy to access. Equity allows outside investors to take partial ownership in the company. Equity is more expensive than debt, especially when interest rates are low. However, unlike debt, equity does not need to be paid back.

Advantage and disadvantage of Debt

- Interest is tax deductible (lowers the effective cost of debt)
- Debt-holders are limited to a fixed return – so stockholders do not have to share profits if the business does exceptionally well.
- Debt holders do not have voting rights
- Higher debt ratios lead to greater risk and higher required interest rates (to compensate for the additional risk).

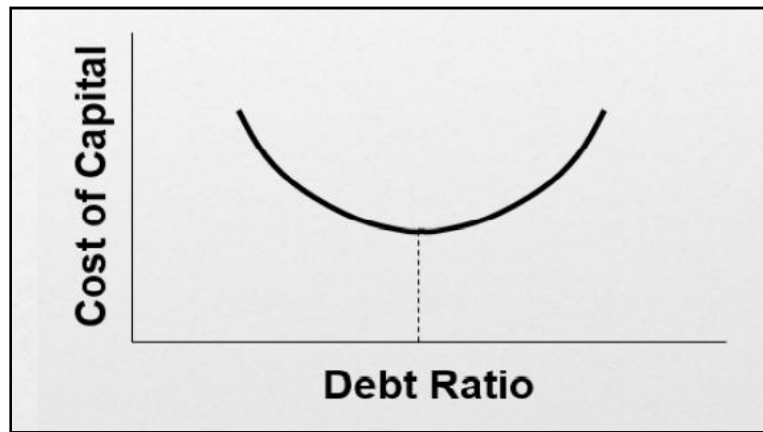
Financial leverage- The use of long term fixed interest bearing debt and preference share capital along with equity share capital is called financial leverage.

Operating Leverage- This leverage depends on the operating fixed cost of the firm. If higher percentage of a firm's total costs is fixed operating costs, the firm is said to have a high degree of operating leverage.

The Debt-to-Equity (D/E) ratio is useful in determining the riskiness of a company's borrowing practices. Thus, capital structure is extremely important and capital structure decisions or practices have a significant role to play in corporate financial management.

## 8.2 Optimal Capital Structure

Optimum Capital Structure is the capital structure at which the weighted average cost of capital is minimum and thereby maximum value of the firm.



So the firm is searching for the optimum debt equity mix where cost of capital is minimum and thereby maximum value of the firm.

Benefits of Optimal Capital Structure: An ideal capital structure should help the company to-

- Minimize the cost of capital.
- Reduce business-related risks.
- Provide needed flexibility.
- Provide control to the owners.
- Maximize the value of the firm.

### 8.3 Cost of Capital for MNCs

The cost of capital for MNCs may differ from that for domestic firms because of the following differences.

- Size of Firm- Because of their size- MNCs are often given preferential treatment by creditors.
- Access to International Capital Markets-MNCs is normally able to obtain funds through international capital markets, where the cost of funds may be lower.
- International Diversification- MNCs may have more stable cash inflows due to international diversification, such that their probability of bankruptcy may be lower.
- Exposure to Exchange Rate Risk- MNCs may be more exposed to exchange rate fluctuations, such that their cash flows may be more uncertain and their probability of bankruptcy higher.
- Exposures to Country Risk- MNCs that have a higher percentage of assets invested in foreign countries are more exposed to country risk. Cost of Capital for MNCs.

The capital asset pricing model (CAPM) can be used to assess how the required rates of return of MNCs differ from those of purely domestic firms. According to CAPM,

$$k_e = R_f + \beta (R_m - R_f)$$

where  $k_e$  = the required return on a stock

$R_f$  = risk-free rate of return

$R_m$  = market return  $\beta$  = the beta of the stock Cost of Capital for MNCs

A stock's beta represents the sensitivity of the stock's returns to market returns, just as a project's beta represents the sensitivity of the project's cash flows to market conditions.

The lower a project's beta, the lower its systematic risk is. An MNC that increases its foreign sales may be able to reduce its stock's beta, and hence the return required by investors. This

translates into a lower overall cost of capital. However, MNCs may consider unsystematic risk as an important factor when determining a foreign project's required rate of return.

### **The MNC's Capital Structure Decision**

The overall capital structure of an MNC is essentially a combination of the capital structures of the parent body and its subsidiaries. The capital structure decision involves the choice of debt versus equity financing, and is influenced by both corporate and country characteristics. Some of the characteristics are-

- Stability of cash flows- MNCs with more stable cash flows can handle more debt.
- Credit risk- MNCs that have lower credit risk have more access to credit.
- Access to retained earnings- Profitable MNCs and MNCs with less growth may be able to finance most of their investment with retained earnings.
- Agency problems- Host country shareholders may monitor a subsidiary, though not from the parent's perspective.
- Guarantees on debt- If the parent backs the subsidiary's debt, the subsidiary may be able to borrow more.
- Stock restrictions- MNCs in countries where investors have less investment opportunities may be able to raise equity at a lower cost.
- Interest rates- MNCs may be able to obtain loanable funds (debt) at a lower cost in some countries.
- Country risk- If the host government is likely to block funds or confiscate assets, the subsidiary may prefer debt financing.
- Strength of currencies- MNCs tend to borrow the host country currency if they expect it to weaken, so as to reduce their exposure to exchange rate risk.
- Tax laws- MNCs may use more local debt financing if the local tax rates (corporate tax rate, withholding tax rate, etc.) are higher.

### **Revising the Capital Structure in Response to Changing Conditions**

As economic and political conditions and the MNC's business strategy change, the costs and benefits of each cost of capital component will change as well. An MNC may revise its capital structure in response to the changing conditions. For example, some MNCs have revised their capital structures to reduce their withholding taxes on remitted earnings.

### **Local versus Global Target Capital Structure**

An MNC may deviate from its "local" target capital structure when local conditions and project characteristics are taken into consideration. If the proportions of debt and equity financing in the parent or some other subsidiaries can be adjusted accordingly, the MNC may still achieve its "global" target capital structure.



Example: A high degree of financial leverage is appropriate when the host country is in political turmoil, while a low degree is preferred when the project will not generate net cash flows for some time. A capital structure revision may result in a higher cost of capital. So, an unusually high or low degree of financial leverage should be adopted only if the benefits outweigh the overall costs.

### International Capital Structure

Once the decision about overall debt-equity mix of an MNC is made, another critical issue that needs to be addressed astutely by the MNC parent is to determine the debt-equity financing mix for its offshore affiliates.

### Country Differences in the Cost of Debt

A firm's cost of debt is determined by the prevailing risk-free interest rate of the borrowed currency and the risk premium required by creditors in that country. The risk-free rate is determined by the interaction of the supply of and demand for funds in a country. It is thus influenced by tax laws, demographics, monetary policies, economic conditions, etc. The risk premium compensates creditors for the risk that the borrower may default on its payments. The risk premium is influenced by economic conditions, the relationships between corporations and creditors, government intervention, the degree of financial leverage, etc. A firm's return on equity can be measured by the risk-free interest rate plus a premium that reflects the risk of the firm. The cost of equity represents an opportunity cost, and is thus also based on the available investment opportunities. It can be estimated by applying a price-earnings multiple to a stream of earnings. High PE multiple - low cost of equity.

### Using the Cost of Capital for Assessing Foreign Projects

- When the risk level of a foreign project is different from that of the MNC, the MNC's weighted average cost of capital (WACC) may not be the appropriate required rate of return for the project.
- There are various ways to account for this risk differential in the capital budgeting process.

### Project and Parent Cash Flows

Project cash flows may not reach the parent:

- Host-country may block cash-flow repatriation.
- Cash flows may be taxed at an unfavorable rate.
- Host government may require a percentage of cash flows to be reinvested in the host country.

## 8.4 Options for Finance Manager

The overall capital structure of an MNC is essentially a combination of the capital structures of the parent body and its subsidiaries. This calls upon the multinational finance manager to evaluate the following three options:

- Debt-equity mix of the subsidiary should conform to the parent company norms.
- Debt-equity mix of the subsidiary should conform to the local norms of the country where it operates.
- Debt-equity mix of the subsidiary should vary to take mileage of opportunities to minimize taxes, offset risks, exploit distortions in capital markets and minimize overall cost of capital of the MNC.

Which of the above options to be chosen depends essentially on whether and to what extent the parent company is responsible for meeting the financial obligations of the subsidiary?

### Debt-equity mix of the subsidiary should conform to the parent company norms

Where the parent is fully responsible for the subsidiary obligations, it would be illusory for the subsidiary to follow debt-equity norm distinct from the parent company. Any accounting condition of a separate capital structure is wholly illusory unless the parent is willing to allow its affiliate to



default on its debt. Thus, as long as the parent company has legal or moral obligations to prevent the affiliate from defaulting, the individual subsidiary has no independent pattern of capitalization.

#### **Debt-equity mix of the subsidiary should conform to the local norms of the country**

In the second option it may not necessarily be in the vital interest of the parent company especially when the subsidiary can locally borrow at cheaper interest rate. Also, an affiliate may not be able to adhere to the parent's financing norm because the host country government prescribes debt equity norms for firms operating in the country. Under such situations, the overall capital structure of the parent company will be determined in a residual manner which may not necessarily reduce the overall cost of capital. The affiliate should not blindly follow the local country financing norm, which reflects the immature nature of local financial markets, especially when it can easily access global financial markets.

#### **Debt-equity mix of the subsidiary should vary to take mileage of opportunities**

The third option of financing is financing structure that enables it to take advantage of cheap loans available in the local market. It may borrow funds even more than what the parent norm permits. Political factor, as stated earlier, generally favors local financing over the parent's direct financing.

#### **Conclusion**

In nutshell, the MNC should decide capital structure of its affiliate keeping in view the latter's effect on the former's overall financial structure and cost of capital. This is for the fact that MNC is legally and/or normally responsible for its affiliate's financial obligations. However, it should allow the affiliate to take mileage of existing financing mileu in the host country so that it is able to achieve its overall objective of cost reduction and value maximization.

## **8.5 Factors Affecting Capital Structure**

Multinational corporations leverage their financial position and access to global markets to raise capital in a cost-effective and efficient manner. This gives these companies an advantage over small domestic operators that do not have the same level of credit or cash, but there are risks associated with international finance. A multinational's capital structure comprises the sources of money used to finance operations, expand production or purchase assets. Companies acquire capital through the sale of securities in financial markets such as the New York Stock Exchange or the London Stock Exchange.

Debt and equity are the two forms of capital that multinationals have to choose from, and each form has its advantages and disadvantages. The main advantage of equity financing is that there is no obligation to repay the money acquired through it. Creditors look favorably upon a relatively low debt-to-equity ratio, which benefits the company if it needs to access additional debt financing in the future. The primary advantage of debt financing is that it allows the founders to retain ownership and control of the company. In contrast to equity financing, debt financing allows an entrepreneur to make key strategic decisions and also to keep and reinvest more company profits. Acquiring debt capital is a process that is contingent on the availability of funds in the global credit markets, interest rates and a corporation's existing debt obligations. To arrange funds for acquiring company's assets, the use of fixed cost sources like debt and preference share capital is called trading on equity or financial leverage.

If the return on assets acquired from the debt funds is greater than the cost of debt, the earnings per share will increase. If a firm becomes over-leveraged, it may be unable to pay its debt obligations leading to insolvency. However, debt costs less to acquire than other forms of financing. If credit markets are experiencing a contraction, it may be difficult for the corporation to sell corporate bonds at favorable rates.

Some of the factors affecting capital structure are given below-

### **Capital Structure-Tax Considerations**

Multinationals have the option to shift income to jurisdictions where the tax treatment is the most advantageous. As a result, debt and equity financing decisions are different relevant to solely domestic companies. If income is reported in the United States, it may be beneficial to obtain debt financing, because the interest is tax-deductible. When making capital structure decisions, multinationals must evaluate their tax planning strategies to minimize their tax liabilities.

High corporate tax, high tax on dividend and capital gains directly influence the decision of capital structure. High tax discourages the issues of equity and encourages to issue more amount debt instrument, as the fixed charges on these securities, i.e., interest can be directly charged to Profit and Loss Account for income tax calculations. Hence, capital structure of a company is affected.

### **Factors Affecting Capital Structure-Equity Financing**

The cost of floating equity is much higher than that of floating debt. This may influence the finance manager to take debt financing the cheaper option. Preferred stock, common stock and components of retained earnings are considered equity capital. It is important for a multinational to carefully analyze its equity cash flows and mitigate the risk associated with currency fluctuations. Otherwise, it may lose equity due to changes in exchange rates.

Offering stock in global financial markets costs multinationals more than acquiring debt, but it may be the right financing option if a corporation is already highly leveraged.

### **Factors affecting the choice of markets**

It has become imperative for most companies to market their products and services outside their domestic markets.

But all markets are not equally attractive nor are the companies competent enough to pursue all markets. A company has to be wise in selecting markets where its foray would be successful.

### **Factors affecting the choice of markets- Economic Factors**

Not all countries will be attractive for all companies. Some companies may discover that some markets cannot afford the products that they sell and they should refrain from entering those markets, whereas there may be some markets which would readily accept a slightly different version of their existing product.

Most western multinational corporations will realize that the huge markets of the developing countries are not for the products that they are selling at home, but for a far less sophisticated version at far less a price. An entirely new set-up of marketing and manufacturing may have to be established to serve such markets. This can be risky but it would be better than serving third world country markets with old products from their portfolio.

### **Factors affecting the choice of markets-Social and Cultural Factors**

Countries are different from one other in terms of language spoken, religion practiced, food eaten and in many other ways. Marketers should consider how these differences can hinder or facilitate the marketing efforts of the company in the new market. A company would do well to pack a troop of sociologists and anthropologists into the target market before it sends its product developers and marketers.

But in most cases, differences in socio-cultural settings have forced marketers to adapt their marketing mix. These may be simple changes such as translation of messages into different languages, or can involve creating completely different marketing mixes for various markets that the company operates in.

**Factors affecting the choice of markets-Political and Legal Factors**

It is important to know the attitude of the government and the people of the host country before a company decides to commit resources. Political stability and attitude towards foreign investment also matter a great deal in encouraging participation of multinational corporations.

A company's historical record and its professed attitude towards foreign investments and properties should also be considered. Streamlined procedures, absence of bureaucratic hurdles, subsidies and incentives are good indicators of a government's willingness in inviting foreign partners in developing their countries.

It is also important for multinational corporations to assess the tax structure and other legal systems and procedures before starting operations in other countries.

**Factors affecting the choice of markets**

**Market Attractiveness** The attractiveness of a market can be assessed by evaluating the market potential in terms of revenues that can be generated, access to the market in terms of the host country being warm to investments by multinational companies, and potential competition and dynamics of the industry in the prospective market.

The revenue and profit potential of a market can be judged on the basis of the level of initial investment required in establishing the operations, the gestation period, the industry structure, and the number and degree of obstacles that the company must face besides competition, i.e., the macro-environmental factors. Most of these indicators can be obtained by studying the history of other players in the market, or if the market is nascent, by studying similar industries.

**Factors affecting the choice of markets-Government Regulations**

The selection of a market entry mode is to a great extent affected by the legislative framework of the overseas market. The governments of most of the Gulf countries have made it mandatory for foreign firms to have a local partner.



For example, the UAE is a lucrative market for Indian firms but most firms operate there with a local partner.

**Factors affecting the choice of markets-Physical Infrastructure**

The level of development of physical infrastructure such as roads, railways, telecommunications, financial institutions, and marketing channels is a pre-condition for a company to commit more resources to an overseas market. The level of infrastructure development (both physical and institutional) has been responsible for major investments in Singapore, Dubai, and Hong Kong. As a result, these places have developed as international marketing hubs in the Asian region.

Before a company decides to go global it should conduct an audit of its resources and capabilities. The company should have clear competitive advantages in terms of market knowledge, technology, portfolio of products, reliable partners and other relevant parameters.

The company should have people with experience in foreign markets. The learning of the home market is largely not applicable in foreign markets, and the home-grown executives should be expected to make strategic and operational blunders. At such times of incursion, it helps to have a chief executive with extensive international exposure to guide the adventure.

**Summary**

Capital structure of the firm determines its risk and earning. The proportion of equity, debt in capital structure has its own benefits and obligations. The debt have tax deduction benefit and equity have a

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benefit of not to repay back. However, debt has fixed obligation. International capital structure also gives benefit of segmentation.

Finance manager aims for optimum capital structure to minimize costs and maximize profit. There are several factors which are considered for framing capital structure of the organizations.

### **Keywords**

**Capital structure:** It is the proportion of debt, preference and equity shares on a firm's balance sheet.

**Optimum Capital structure:** It is the capital structure at which cost is minimum and thereby profit is maximum.

**Financial leverage:** It is the use of long-term fixed interest-bearing debt and preference share capital along with equity share capital

**Operating Leverage:** It is the use operating fixed cost of the firm. If a higher percentage of a firm's total costs is fixed operating costs, the firm is said to have a high degree of operating leverage.

**Debt equity mix:** This is the amount of proportion in debt and equity in capital structure of the organizations.

### **Self Assessment**

1. The term capital structure denotes
  - A. Total of Liability side of Balance Sheet
  - B. Equity Funds, Preference Capital and Long term Debt
  - C. Total Shareholders' Equity
  - D. Types of Capital Issued by a Company
  
2. Tax-rate is relevant and important for calculation of specific cost of capital of
  - A. Equity Share Capital
  - B. Preference Share Capital
  - C. Debentures,
  - D. Both A and B
  
3. Debt Financing is a cheaper source of finance because of
  - A. Time Value of Money
  - B. Rate of Interest
  - C. Tax-deductibility of Interest
  - D. Dividends not Payable to lenders
  
4. Advantage of Debt financing is
  - A. Interest is tax-deductible
  - B. It reduces WACC
  - C. Does not dilute owners control
  - D. All of the above
  
5. The use of long term fixed interest bearing debt and preference share capital along with equity share capital is called -----

- A. Financial leverage
  - B. Operating leverage
  - C. Both of the above
  - D. None of the above
6. High degree of financial leverage means
- A. High debt proportion
  - B. Lower debt proportion
  - C. Equal
  - D. None of the above
7. Operating leverage helps in analysis of
- A. Business Risk
  - B. Financing Risk
  - C. Production Risk
  - D. Credit Risk
8. Which of the following is studied with the help of financial leverage?
- A. Marketing Risk
  - B. Production Risk
  - C. Finance Risk
  - D. None of the above
9. Firm's Cost of Capital is the average cost of
- A. All sources
  - B. All borrowings
  - C. Share capital
  - D. Not Applicable
10. Optimum Capital Structure is the capital structure at which the weighted average cost of capital is -----and thereby maximum value of the firm.
- A. Minimum
  - B. Maximum
  - C. All facts are not given
  - D. Not Applicable
11. The main advantage of equity financing is that there is -----obligation to repay the money acquired through it
- A. No
  - B. Much
  - C. Only some
  - D. Not Applicable

Unit 08: Capital Structure of the Multinational Firm

12. By internationalizing its corporate ownership structure, a firm can generally increase its share price and lower its cost of capital.
- A. True  
B. False
13. A firm's return on equity can be measured by the risk-free interest rate plus a premium that reflects the risk of the firm.
- A. True  
B. False
14. The MNC should decide capital structure of its affiliate keeping in view the latter's effect on the former's overall financial structure and cost of capital.
- A. True  
B. False
15. In contrast to equity financing, debt financing allows an entrepreneur to make key strategic decisions and also to keep and reinvest more company profits.
- A. True  
B. False

**Answers for Self Assessment**

1. B      2. C      3. C      4. D      5. B
6. A      7. A      8. C      9. A      10. A
11. A      12. A      13. A      14. A      15. A

**Review Questions**

- 1) What do you mean by capital structure?
- 2) Elaborate in brief about debt and equity advantages in capital structure.
- 3) What do you mean by optimum capital structure?
- 4) Elaborate various factors affecting capital structure of the Multinational corporations.



**Further Readings**

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Summary

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**Objective**

- understand the significance of capital budgeting decisions.
- interpret domestic versus international capital budgeting.
- understand the concept of cost of capital and its calculations.
- Interpret the concept of capital asset pricing model.

**Introduction**

Capital budgeting decisions relate to acquisition of assets that generally have long-term strategic implications for the firm. The firm's investment decisions would generally include expansion, acquisition, modernization and replacement of the long-term assets. There are a number of techniques for evaluating various projects. Cost of capital is also an important ingredient in evaluating viability and profitability of the project.

**9.1 Meaning and Definitions of Capital Budgeting:**

The process through which different projects are evaluated is known as capital budgeting. Capital budgeting is defined "as the firm's formal process for the acquisition and investment of capital. It involves firm's decisions to invest its current funds for addition, disposition, modification and replacement of fixed assets".

"Capital budgeting is long term planning for making and financing proposed capital outlays"- Charles T Horngreen.



### International Financial management

“Capital budgeting consists in planning development of available capital for the purpose of maximizing the long term profitability of the concern” – Lynch

**Features of Capital Budgeting Decision:** Capital budgeting decisions are characterized by:

- Potentially large anticipated benefits
- Relatively long time period between the initial outlay and the anticipated return.
- Relatively high degree of risk
- Non reversible

**Capital Budgeting Process:** The process of capital budgeting involves the following steps:

- Identification of investment proposals
- Screening and evaluation of the proposals
- Fixing priorities
- Final approval and preparation of capital expenditure budget
- Implementing proposals
- Performance review

These steps are undertaken to choose any project for decision taking.

**Why Is Capital Budgeting Analysis so Important to the Firm?**

- The fundamental goal of the financial manager is to maximize shareholder wealth.
- Capital investments with positive NPV or APV contribute to shareholder wealth. Additionally, capital investments generally represent large expenditures relative to the value of the entire firm.
- These investments determine how efficiently and expensively the firm will produce its product. Consequently, capital expenditures determine the long-run competitive position of the firm in the product marketplace.

## **9.2 Domestic Capital Budgeting**

1. Identify the SIZE and TIMING of all relevant cash flows on a time line.
2. Identify the RISKINESS of the cash flows to determine the appropriate discount rate.
3. Find NPV by discounting the cash flows at the appropriate discount rate.
4. Compare the value of competing cash flow streams at the same point in time.

The basic net present value equation is

$$NPV = \text{Sum of } \frac{CF_t}{(1+K)^t} + \frac{TV_t}{(1+K)^T} - C_0$$

Where:

CF<sub>t</sub> = expected incremental after-tax cash flow in year t,

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TVT = expected after tax terminal value including return of net working capital,

$C_0$  = initial investment at inception,

$K$  = weighted average cost of capital.

$T$  = economic life of the project in years.

The NPV rule is to accept a project if NPV greater than or equal to 0 and vice versa.



Example: Brower, Inc. just constructed a manufacturing plant in Ghana. The construction cost 9 billion Ghanaian cedi. Brower intends to leave the plant open for three years. During the three years of operation, cedi cash flows are expected to be 3 billion cedi, 3 billion cedi, and 2 billion cedi, respectively. Operating cash flows will begin one year from today and are remitted back to the parent at the end of each year.

At the end of the third year, Brower expects to sell the plant for 5 billion cedi. Brower has a required rate of return of 17 percent. It currently takes 8,700 cedi to buy one U.S. dollar, and the cedi is expected to depreciate by 5 percent per year.

Determine the NPV for this project. Should Brower build the plant?

Year	0	1	2	3
Investment	-9			
Operating CF		3	3	2
Salvage Value				5
Net CF	-9		3	7
Exchange rate	8,700	9,135	9,592	10,071
Cash flows to parent	-\$1,034,483	\$328,407.23	\$312,760.63	\$695,065.04
PV of parent cash flows	-\$1,034,483	\$280,689.94	\$228,475.88	\$433,978.15
NPV	-\$1,034,483	-\$753,793.06	-\$525,317.18	-\$91,339.03

Since the project has a negative net present value (NPV), Brower should not undertake it.



Example: A project in South Korea requires an initial investment of 2 billion South Korean won. The project is expected to generate net cash flows to the subsidiary of 3 billion and 4 billion won in the two years of operation, respectively. The project has no salvage value. The current value of the won is 1,100 won per U.S. dollar, and the value of the won is expected to remain constant over the next two years.

*International Financial management*

What is the NPV of this project if the required rate of return is 13 percent?

Repeat the question, except assume that the value of the won is expected to be 1,200 won per U.S. dollar after two years. Further assume that the funds are blocked and that the parent company will only be able to remit them back to the U.S. in two years. How does this affect the NPV of the project?

Year	0	1	2
Investment	-2		
Operating CF		3	4
Net CF	-2	3	4
Exchange rate	1,100	1,100	1,100
Cash flows to parent	-\$1,818,181.82	\$2,727,272.73	\$3,636,363.64
PV of parent cash flows	-\$1,818,181.82	\$2,413,515.69	\$2,847,806.12
NPV	-\$1,818,181.82	\$595,333.87	\$3,443,139.99

The NPV is \$3,443,139.99.

The NPV in second case is calculated as-

Year	0	2
Investment	-2	
Operating CF		7

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Net CF		
Exchange rate	1,100	1,200
Cash flows to parent	-\$1,818,181.82	\$5,833,333.33
PV of parent cash flows	-\$1,818,181.82	\$4,568,355.65
NPV	-\$1,818,181.82	\$2,750,173.83

A situation where the funds are blocked and the won is expected to depreciate reduces the NPV by \$692,966.16.

**Why should capital budgeting for subsidiary projects be assessed from the parent's perspective?**

A capital project of a subsidiary of the parent may have a positive NPV (or APV) from the subsidiary's perspective yet have a negative NPV (or APV) from the parent's perspective due to following:

- **Restricted Remittances:** if certain cash flows cannot be repatriated to the parent because of remittance restrictions by the host country.
- **Exchange rate movements:** if the home currency is expected to appreciate substantially over the life of the project, yielding unattractive cash flows when converted into the home currency of the parent.
- **Tax differentials:** Additionally, a higher tax rate in the home country may cause the project to be unprofitable from the parent's perspective.

Any of these reasons could result in the project being unattractive to the parent and the parent's stockholders.

**Capital budgeting from the Parent Firm's Perspective**

One recipe for international decision makers:

1. Estimate future cash flows in foreign currency.
2. Convert to the home currency at the predicted exchange rate.
3. Use PPP, IRP et cetera for the predictions.
4. Calculate NPV using the home currency cost of capital.

**Another recipe for international decision makers:**

1. Estimate future cash flows in foreign currency.
2. Estimate the foreign currency discount rate.
3. Calculate the foreign currency NPV using the foreign cost of capital.
4. Translate the foreign currency NPV into dollars using the spot exchange rate

### 9.3 International Capital Budgeting

You have two equally valid approaches:

- Change the foreign cash flows into dollars at the exchange rates expected to prevail. Find the \$NPV using the dollar cost of capital.
- Find the foreign currency NPV using the foreign currency cost of capital. Translate that into dollars at the spot exchange rate.

**What Is Adjusted Present Value:** The adjusted present value is the net present value (NPV) of a project or company if financed solely by equity plus the present value (PV) of any financing benefits, which are the additional effects of debt. By taking into account financing benefits, APV includes tax shields such as those provided by deductible interest.

Adjusted Present Value = Unlevered Firm Value + NE

where: NE = Net effect of debt

The net effect of debt includes tax benefits that are created when the interest on a company's debt is tax-deductible. The present value of the interest tax shield is therefore calculated as:  $(\text{tax rate} * \text{debt load} * \text{interest rate}) / \text{interest rate}$ .

**Steps to Calculate Adjusted Present Value:** To determine the adjusted present value:

- Find the value of the un-levered firm.
- Calculate the net value of debt financing.
- Sum the value of the un-levered project or company and the net value of the debt financing.

The adjusted present value helps to show an investor the benefits of tax shields resulting from one or more tax deductions of interest payments or a subsidized loan at below-market rates. For leveraged transactions, APV is preferred.

#### **Example of How to Use Adjusted Present Value (APV)**

In a financial projection where a base-case NPV is calculated, the sum of the present value of the interest tax shield is added to obtain the adjusted present value. For example, assume a multi-year projection calculation finds that the present value of Company ABC's free cash flow (FCF) plus terminal value is \$100,000. The tax rate for the company is 30% and the interest rate is 7%. Its \$50,000 debt load has an interest tax shield of \$15,000, or  $(\$50,000 * 30% * 7%) / 7%$ . Thus, the adjusted present value is \$115,000, or  $\$100,000 + \$15,000$ .

#### **Risk Adjustment in the Capital Budgeting Process: Risk-Adjusted Discount Rate**

- Clearly risk and return are correlated.
- Political risk may exist alongside business risk, necessitating an adjustment in the discount rate.
- The greater the uncertainty about a project's forecasted cash flows, the larger the discount rate should be applied to cash flows, other things being equal. This risk-adjusted discount rate tends to reduce the worth of a project by a degree that reflects the risk the project exhibits.



Example: Santa Monica Co., a U.S.-based MNC, was considering establishing a consumer products division in Germany, which would be financed by German banks. Santa Monica completed its capital budgeting analysis in August. Then, in November, the government leadership stabilized, and political conditions improved in Germany. In response, Santa Monica increased its expected cash flow by 20 percent but did not adjust the discount rate applied to the project. Should the discount rate be affected by the change in political conditions?

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The risk may have declined if there is less uncertainty surrounding cash flows. However, if the political conditions also encourage more firms to do business in Germany, there may be more intense competition from other firms that could penetrate the market, which results in more risk.

#### **Sensitivity Analysis**

Sensitivity analysis relates to finding out the critical variables in the assumptions of cash flow. Then find the change in NPV of the project with a given change in each of the critical variables. Only one variable is assumed to change at a time. Hence, the realized value may be different from what was expected.

In sensitivity analysis, different estimates are used for expected inflation rates, cost and pricing estimates, and other inputs for the NPV to give the manager a more complete picture of the planned capital investment.



Example: A US MNC's Singapore subsidiary is selling tennis rackets. Demand for tennis rackets was estimated to be 60,000 in the first 2 years and 100,000 in the next 2 years. If demand turns out to be 60,000 in all 4 years, how will the NPV results change? Alternatively, what if demand is 100,000 in all 4 years?

Use of such what-if scenarios is referred to as sensitivity analysis. The objective is to determine how sensitive the NPV is to alternative values of the input variables.

The estimates of any input variables can be revised to create new estimates for NPV. If the NPV is consistently positive during these revisions, then the MNC should feel more comfortable about the project. If it is negative in many cases, the accept/reject decision for the project becomes more difficult.

#### **Scenario Analysis**

Scenario analysis is similar to sensitivity analysis in approach. It recognizes that because of the interrelationships several variables change simultaneously. Each case classified as scenario; we find the change in NPV for simultaneous change in several variables. The decision-maker can develop some plausible scenarios for this purpose. For instance, we can consider different scenarios: pessimistic, optimistic and worst.

#### **Simulation Analysis**

The Monte Carlo simulation or simply the simulation analysis considers the interactions among variables and probabilities of the change in variables. It computes the probability distribution of NPV. Scenario analysis suffers from the disadvantage that sufficiently large scenarios may not be available for reliable decision making. Simulation overcomes the problem of scenario analysis.

It is possible to simulate a large number of scenarios and find out the NPVs under each so as to make statistical data dependable and relevant for decision making.

The simulation analysis involves the following steps:

- First, you should identify variables that influence cash inflows and outflows.
- Second, specify the formulae that relate variables.
- Third, indicate the probability distribution for each variable.
- Fourth, develop a computer program that randomly selects one value from the probability distribution of each variable and uses these values to calculate the project's NPV.

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Capital budgeting decisions relate to acquisition of assets that generally have long-term strategic implications for the firm. In real life situations, the firm in general and its investment projects in particular are exposed to different degrees of risk. What is risk and how can risk be incorporated and measured in investment decisions in real world situations?

#### **9.4 Techniques of Multinational Capital Budgeting- NPV, IRR, APV.**

The presence of time as a factor in investment is fundamental for the purpose of evaluating investment. Time is a crucial factor, because the real value of money fluctuates over a period of time. Discounted cash flow technique takes into account both the interest factor and the return after the payback 'period.

The discounted cash flow technique involves the following steps:

- Calculation of cash inflow and out flows over the entire life of the asset.
- Discounting the cash flows by a discount factor
- Aggregating the discounted cash inflows and comparing the total so obtained with the discounted-out flows.

#### **Net Present Value Method**

It recognizes the impact of time value of money. It is considered the best method of evaluating the capital investment proposal. It is widely used in practice. The cash inflow to be received at different period of time will be discounted at a particular discount rate.

Using the company's cost of capital, the NPV is the sum of the discounted cash flows minus the original investment. The difference between the two will be used for accepting or reject criteria.

#### **Acceptance Rule**

- Accept the project when NPV is positive
- Reject the project when NPV is negative

The NPV method can be used to select between mutually exclusive projects; the one with the higher NPV should be selected.

#### **Pros:**

- It recognizes the time value of money.
- It considers the cash inflow of the entire project.
- It estimates the present value of their cash inflows by using a discount rate equal to the cost of capital.
- It is consistent with the objective of maximizing the welfare of owners.

#### **Cons:**

- It is very difficult to find and understand the concept of cost of capital
- It may not give reliable answers when dealing with alternative projects under the conditions of unequal lives of project.

#### **Question on NPV**

An investment of 10000(having a scrap value of 500) yields the following return:

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Year	Cash flow
1 <sup>st</sup>	4000
2 <sup>nd</sup>	4000
3 <sup>rd</sup>	3000
4 <sup>th</sup>	3000
5 <sup>th</sup>	2000

Is the investment desirable? Discuss according to NPV assuming PV factor for first-five years-.909,.826,.751,.683,.621 respectively.

Year	Cash flow	PV FACTOR	Present value
1st	4000	.909	3636
2nd	4000	.826	3304
3rd	3000	.751	2253
4 <sup>th</sup>	3000	.683	2049
5th	2000	.621	1242
Scrap	500	.621	310.5
		Total Present Value	12794.5

Net Present value = Present value - Initial cost

$$= 12794.5 - 10000 = 2794.5$$

As NPV is positive Investment desirable.

### Profitability Index

To calculate following formula is used-

Profitability index = present value of inflows / present value of outflows

Accept if P.I is greater than 1

Reject if P.I is less than 1

#### Advantages:

In which different costs are there we cannot rank as NPV method so profitability index can be used for the same.

### Question on PI

The initial outlay of the project is 100000 and it generate 50000,30000, 50000,20000 from the end of first year to fourth year. Assume discount rate is 10%. Calculate profitability index. The PV factor is for one to four years is

.909

.826

.751

.683



Year	Cash flow	PV FACTOR	Present value
1st	50000	.909	36360
2nd	30000	.826	24780
3rd	50000	.751	37550
4 <sup>th</sup>	20000	.683	13660
		Total Present Value	112350

For calculating PI

Profitability Index = Present value of inflows / Present value of outflows

$112350/100000 = 1.1235$

Net profitability index = accept if P.I is greater than 1: Reject if P.I is less than 1

### Internal Rate of Return

It is that rate at which the sum of discounted cash inflows equals the sum of discounted cash outflows. It is the rate of discount which reduces the NPV of an investment to zero.

It is called internal rate because it depends mainly on the outlay and proceeds associated with the project and not on any rate determined outside the investment

### IRR - Decision Rule

Decision Rule:

It is compared with the cost of capital to make judgment about its desirability.

ACCEPT IF  $IRR > \text{COST OF CAPITAL}$

REJECT IF  $IRR < \text{COST OF CAPITAL}$

In case of mutually exclusive projects:

Accept the project with highest IRR, provided it is greater than required rate of return (K<sub>o</sub>).

### Calculating IRR

- When cash inflows are equal
- When cash inflows are not equal

a) When cash inflows are equal:

$PVF = \text{Initial outlay} / \text{Annual cash inflow}$

Then consult the PV table with the number of years equal to the life of the assets & find out the rate at which calculated PVF = PV given in the table

b. When cash inflows are not equal over the life of the asset:

Process

Then Hit & trial method is used to see total value of cash outflow is equal to cost of initial investment. The rate at which cash outflow is equal to the cost of initial investment is called internal rate of return.

If NPV is positive, apply for a higher rate of discount

If NPV is negative, the IRR must be between two rates

$IRR = LDR + P1-O * (HDR-LDR)$

P1-P2

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**Question on IRR**

A project cost Rs 32000 and it's expected to generate an inflow of 8000 each for 5 years. Calculate internal rate of return.

At 7% 8% and 9% per annum the present value of Rs one received annually for 5 years is 4.1002, 3.9926, 3.8896.

The cash inflow is uniform for 5 years.

**First**-Calculation of PV factor

$PVF = \text{Initial outlay} / \text{Annual cash inflow}$

$$= 32000 / 8000 = 4$$

**Second**-Then consult the PV table with the number of years equal to the life of the assets & find out the rate at which calculated PVF = PV given in the table

- At 7% 8% and 9% per annum the present value of Rs one received annually for 5 years is 4.1002, 3.9926, 3.8896.
- Referring to table at 4 FACTOR lies between 4.1002 and 3.9926 which is 7% and 8%. Therefore IRR lies between 7% and 8%

**Third**

- Now Calculating Present value of cash inflow at 7% =  $8000 * 4.1002 = 32801.6$
- Now Calculating Present value of cash inflow at 8% =  $8000 * 3.9926 = 31940.8$

Now Interpolation of IRR

$$IRR = LDR + \frac{P1 - O}{P1 - P2} * (HDR - LDR)$$

$$= 7 + \frac{32801.6 - 32000}{32801.6 - 31940.8} * (8 - 7)$$

$$= 7 + \frac{801.6}{860.8} * 1$$

$$= 7 + .931$$

$$= 7.931\%$$

**Advantages of IRR Method**

Despite its conflicts and drawbacks, IRR remains a popular method of evaluation of projects because of

- It considers the time value of money
- It considers the cash inflow of the entire project.
- Cost of capital not required to find IRR. It is not in conflict with the concept of maximizing the welfare of the equity shareholders.

**Disadvantage of IRR Method**

- Computation of IRR is tedious and difficult to understand
- Both NPV and IRR assume that the cash inflows can be reinvested at the discounting rate in the new projects.

**Adjusted Present Value**

Adjusted Present Value (APV) is used for the valuation of projects and companies. It takes the net present value (NPV), plus the present value of debt financing costs, which include interest tax shields, costs of debt issuance, costs of financial distress, financial subsidies, etc.

**Question involving all Methods of Discounting Cash Flow**

The estimated cash flow from the project with an initial investment of 70000 will be 10000, 20000, 30000, 45000, and 60000 in the first to fifth year respectively.

Compute

- A. Net present value of project@25% discount rate.
- B. Profitability Index.
- C. Internal rate of return of the project.

Discount factor at

Year	25%	30%
1st	.800	.769
2nd	.640	.592
3rd	.512	.455
4 <sup>th</sup>	.410	.350
5 <sup>th</sup>	.328	.269

**A. Net present value of project @25% discount rate.**

Year	Cash flow	PV FACTOR	Present value
1st	10000	.800	8000
2nd	20000	.640	12800
3rd	30000	.512	15360
4 <sup>th</sup>	45000	.410	18450
5 <sup>th</sup>	60000	.328	19680
		Total Present Value	74290

NPV=Total present value-Initial Investment

NPV =74290-70000=4290

**B.Profitability index = present value of inflows/ present value of outflows**

= 74290/70000

= 1.06

**C. IRR**

AT 25% PV FACOTR Present value is 74290 which more than initial investment. Hence next trial rate of return is 30%

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Year	Cash flow	PV FACTOR	Present value
1st	10000	.769	7690
2nd	20000	.592	11840
3rd	30000	.455	13650
4 <sup>th</sup>	45000	.350	15750
5th	60000	.261	15140
		<b>Total Present Value</b>	<b>65070</b>

AT 30% PV FACOTR Present value is 65070 which less than initial investment. Hence actual rate is calculated. Now Interpolation of IRR

$$\text{IRR} = \text{LDR} + \frac{\text{P1}-\text{Q}}{\text{HDR}-\text{LDR}}$$

$$\text{P1}-\text{P2}$$

$$=25+74290-70000 *(30-25)$$

$$74290-65070$$

$$25 + 4290 *5$$

$$9220$$

$$= 25+.2.36$$

$$= 27.326\%$$

## 9.5 Cost of capital

Cost of capital is an extremely important input requirement for capital budgeting decisions.

Without knowing the cost of capital no firm can evaluate the desirability of the implementation of new projects. Cost of capital serves as a benchmark for evaluation.

The cost of capital is the minimum required rate of earning or cut off rate of capital expenditure. -Solomon Ezra

The cost of capital is the minimum rate of return which a firm requires as a condition for undertaking investment. -Milton H Spencer

So, we can say characteristics are-

- Minimum rate of return of capital.
- Reward of Business and Financial Risk.

The basic determinant of cost of capital is the expectations of the suppliers of capital. Viewed from all investors' point of view, the firm's cost of capital is the rate of return required by them for supplying capital for financing the firm's investment projects by purchasing various securities.

### **Importance of Cost of Capital**

- Evaluating the investment options.
- Capital budgeting decisions.
- Designing the optimal capital structure.
- It is useful in framing optimum credit policy.

**Characteristics of MNCs can Influence and The Cost of Capital**

- Size. MNCs have more opportunities to grow, and larger, better-known firms may receive preferential treatment by creditors.
- Access to international capital markets. MNCs have access to more sources of funds than domestic firms. To the extent that financial markets are segmented, MNCs may be able to obtain financing from various sources at a lower cost.
- International diversification. If MNCs can achieve more stable cash flows through their international diversification, their probability of bankruptcy is reduced. Creditors and shareholders may therefore accept a lower rate of return when providing funds to the MNCs, which reflects a lower cost of capital for MNCs.
- Exchange rate risk. MNCs that are highly exposed to exchange rate movements may be more likely to experience financial problems (if they do not hedge the risk). Thus, they may incur a higher cost of capital.
- Country risk. MNCs with subsidiaries in politically unstable countries may experience volatile cash flows over time and be more susceptible to financial problems. Thus, they may incur a higher cost of capital.

**The Firm's Investment Decision and the Cost of Capital**

- A firm that can reduce its cost of capital will increase the profitable capital expenditure that the firm can take on and increase the wealth of the shareholders.
- Internationalizing the firm's cost of capital is one such policy.

**Cost of Capital in Segmented vs. Integrated Markets**

In segmented capital markets, the cost of capital will be determined essentially by the securities' domestic systematic risks. In integrated capital markets, on the other hand, the cost of capital will be determined by the securities' world systematic risk, regardless of nationality.

If capital markets are segmented, then investors can only invest domestically. This means that the market portfolio (M) in the CAPM formula would be the domestic portfolio instead of the world portfolio.

$$R_i = R_f + b_i (R_{U.S.} - R_f)$$

v/s

$$R_i = R_f + b_i (R_W - R_f)$$

Clearly integration or segmentation of international financial markets has major implications for determining the cost of capital.

**9.6 Trade-off Theory of Capital Structure**

A firm can raise new capital by:

- Issuing new equity (E) -a firm gives away ownership and has to pay dividends
  - Issuing debt (D) -a firm borrows and has to pay interest payments.
  - Retained earnings(E)- The firm can also use retained earnings, which we will consider E.
- Trade-off Theory of Capital Structure

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- Firms will use the E and D mix that minimizes the cost of capital, kc. There is a U-shape relation between cost of capital and the amount of debt relative to the total value of the firm ( $V=E+D$ ).

### Cost of Debt

The computation of cost of debt issued at par is comparatively an easy task. It is the explicit interest rate adjusted further for the tax liability of the company.

**Debt Issued at Par:** It may be computed according to the following formula:

$$K_d = (1-T)R$$

Where,

$K_d$  = Cost of debt;

$T$  = Marginal tax rate;

$R$  = Debenture interest rate.

**Debt Issued at Premium or Discount:** It may be computed according to the following formula:

$$K_d = (1-T)R/NP$$

Cost of Redeemable Debt

To mobilise debt one has to incur floatation cost which increases the cost of debt.

### Cost of Redeemable Debt-

$$\text{Cost of debt} = \frac{\text{Annual Interest} + (MV - NP/n) * 100}{MV + NP/2}$$

After tax cost of debt = cost of debt before tax (1-T)

- NP when issued at Par = Par Value - Floatation cost
- NP when issued at Premium = Par Value + Premium - Floatation cost
- NP when issued at Discount = Par Value - Discount - Floatation cost

### Cost of Preference Capital

Preference capital is in between pure debt and equity that explicitly states a fixed dividend. The dividend has claim prior to that of equity holders. But unlike interest on the debt the dividend on preference capital is not tax deductible. Cost of preference capital,  $r_p$  is determined by equating its cash flows to market price. No adjustment for tax is required.

Cost of redeemable Pref. Shares is calculated as

$$\frac{\text{Dividend} + (MV - NP)/n * 100}{MV + NP/2}$$

### Cost of Equity Capital

Cost of equity capital is most difficult to determine because

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- It is not directly observable.
- There is no legal binding to pay any compensation, and
- It is not explicitly mentioned.

The cost of new equity can be determined according to the following formula:

**Dividend Yield Method:**

$$K_e = D/NP * 100 \quad \text{or} \quad D/MP * 100$$

**Earning Yield Method:**

$$K_e = EPS/NP * 100 \quad \text{or} \quad EPS/MP * 100$$

A company Issues 1000 equity share of Rs. 100 each, at 10% premium. The company has been paying 20% dividend. Also find cost if market price is Rs.160.

$$K_e = D/NP * 100 = 20/110 * 100 = 18.18\%$$

$$K_e = D/MP * 100 = 20/160 * 100 = 12.5\%$$

**Dividend Yield + growth in dividend Method:**

$$K_e = D/NP + G$$

$$K_e = D/MP + G$$

A company Issues 1000 equity share of Rs. 100 each, at PAR. The floatation cost is 5% of the share price. The company has been paying 10 per cent initially and the growth is expected to 5%. Find cost of new share.

$$K_e = D/NP + G = 10/95 + 5 = 15.53\%$$

(B) If market price is 150 find cost of existing share cost.

$$K_e = D/MP + G = 10/150 + 5 = 11.67\%$$

**Cost of Equity CAPM Approach**

CAPM based determination of cost of equity considers the risk characteristics that dividend capitalization approach ignores. Determinants of cost of equity under CAPM based approach include three parameters.

The risk free rate,  $r_f$  = expected return on risk free securities

The market return,  $r_m$  and = expected risk on the market

$\beta$ , as measure of risk= expected risk of the project

The estimated Beta of a stock is 1.2. The risk-free rate is 5% and the expected market return is 13%.

$$r_e = r_f + \beta \times (r_m - r_f)$$

$$5\% + 1.2(13\% - 5\%)$$

$$= 14.6\%$$

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#### Weighted Average Cost

As is evident from the name, cost of capital refers to the weighted average cost of various capital components, i.e., sources of finance, employed by the firm such as equity, preference or debt. In finer terms, it is the rate of return that must be received by the firm on its investment projects, to attract investors to invest capital in the firm and to maintain its market value

For a levered firm, the financing costs can be represented by the weighted average cost of capital:

$$K = (1 - \beta)K_i + \beta(1 - t)i$$

Where,

$K$  = weighted average cost of capital.

$K_i$  = cost of equity capital for a levered firm.

$i$  = pretax cost of debt.

$\beta$  = debt to total market value ratio.

$t$  = marginal corporate income tax rate.



Example: An MNC has total assets of \$100 million and debt of \$20 million. The firm's before-tax cost of debt is 12 percent, and its cost of financing with equity is 15 percent. The MNC has a corporate tax rate of 40 percent. What is this firm's weighted average cost of capital?

$$K = (1 - \beta)K_i + \beta(1 - t)i$$

Ans : 13.44%



Example: Gaggle Internet, Inc. is evaluating its cost of capital under alternative financing arrangements. In consultation with investment bankers, Gaggle expects to be able to issue new debt at par with a coupon rate of 8% and to issue new preferred stock with a \$2.50 per share dividend at \$25 a share.

The common stock of Gaggle is currently selling for \$20.00 a share. Gaggle expects to pay a dividend of \$1.50 per share next year. Market analysts foresee a growth in dividends in Invest stock at a rate of 5% per year. Gaggle's marginal tax rate is 35%.

If Gaggle raises capital using 45% debt, 5% preferred stock, and 50% common stock, what is Gaggle's cost of capital?

$$r_d^* = 0.08 (1 - 0.35) = 0.052 \text{ or } 5.2\%$$

$$r_p = \$2.50 / \$25 = 10\% \quad D/MP \times 100 + G$$

$$r_e = \$1.50 / \$20 + 5\% = 7.5\% + 5\% = 12.5\%$$

If Gaggle raises capital using 45% debt, 5% preferred stock, and 50% common stock, what is Gaggle's cost of capital?

$$WACC = [0.45 (0.052)] + [0.05 (0.10)] + [0.50 (0.125)]$$

$$WACC = 0.0234 + 0.005 + 0.0625 = 0.0909 = 9.09\%$$



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Blues, Inc. is an MNC located in the U.S. Blues would like to estimate its weighted average cost of capital. On average, bonds issued by Blues yield 9 percent. Currently, T-bill rates are 3 percent. Furthermore, Blues' stock has a beta of 1.5, and the return on the Wilshire 5000 stock index is expected to be 10 percent.

Blues' target capital structure is 30 percent debt and 70 percent equity. If Blues is in the 35 percent tax bracket, what is its weighted average cost of capital?

$$\text{Cost of equity: } r_e = r_f + \beta \times (r_m - r_f) = 13.5\%$$

$$K = (1 - t)K_l + tI = \text{WACC: } 11.21\%$$

Does the Cost of Capital Differ among Countries?

- There do appear to be differences in the cost of capital in different countries.
- When markets are imperfect, international financing can lower the firm's cost of capital.
- One way to achieve this is to internationalize the firm's ownership structure.

The Effect of Foreign Equity Ownership Restrictions

- While companies have incentives to internationalize their ownership structure to lower the cost of capital and increase market share, they may be concerned with the possible loss of corporate control to foreigners.
- In some countries, there are legal restrictions on the percentage of a firm that foreigners can own.
- These restrictions are imposed as a means of ensuring domestic control of local firms.

#### The Financial Structure of Subsidiaries:

There are three different approaches to determining the subsidiary's financial structure.

- Conform to the parent company's norm.
- Conform to the local norm of the country where the subsidiary operates.
- Vary judiciously to capitalize on opportunities to lower taxes, reduce financing costs and risk, and take advantage of various market imperfections.

In addition to taxes, political risk should be given due consideration in the choice of a subsidiary's financial structure.



Example: Drexel Co. is a U.S.-based company that is establishing a project in a politically unstable country. It is considering two possible sources of financing. Either the parent could provide most of the financing, or the subsidiary could be supported by local loans from banks in that country. Which financing alternative is more appropriate to protect the subsidiary?

Drexel should let local banks support the subsidiary since it would be in the interest of the banks to see that the subsidiary performs well. If the host government-imposed restrictions that reduced the subsidiary's profits, the banks could be adversely affected as well.

Financing from the MNC parent would not provide such protection since the local banks would have less interest in protecting the subsidiary from host government restrictions.



Example: Wizard, Inc. has a subsidiary in a country where the government allows only a small amount of earnings to be remitted to the U.S. each year. Should Wizard finance the subsidiary with debt financing by the parent, equity financing by the parent, or financing by local banks in the foreign country

Wizard should use financing by local banks in the foreign country, so that the subsidiary can make use of its funds by paying off local debt.

## 9.7 The Capital Asset Pricing Model

No matter how much we diversify our investments, it's impossible to get rid of all the risk. As investors, we deserve a rate of return that compensates us for taking a risk. The (CAPM) helps us to calculate investment risk and what return on investment we should expect. Modern Portfolio Theory shows that specific risk can be removed through Diversification. The trouble is that diversification still doesn't solve the problem of systematic risk; even a portfolio of all the shares in the stock market can't eliminate that risk.

Therefore, when calculating a deserved return, systematic risk is what plagues investors most. CAPM, therefore, evolved as a way to measure this systematic risk. Markowitz, William Sharpe (1964), John Lintner (1965 and Jan Mossin (1966) provided the basic structure for the CAPM model. It is a model of linear general equilibrium return. The model takes into account the asset's sensitivity to non-diversifiable risk(also known as systematic risk), often represented by the quantity beta ( $\beta$ ) in the financial industry, as well as the expected return of the market and the expected return of a theoretical risk free asset.

The required rate return of an asset is having a linear relationship with asset's beta value i.e., un-diversifiable or systematic risk.

### Assumptions

- An individual seller or buyer cannot affect the price of a stock.
- Investors make their decisions only on the basis of the expected returns, standard deviations and covariance of all pairs of securities.
- Investors are assumed to have homogenous expectations during the decision-making period.
- The investor can lend or borrow any amount of funds at the riskless rate of interest.
- Assets are infinitely divisible.
- There is no transaction cost.
- There is no personal income tax.
- Unlimited quantum of short sales, is allowed

A model that describes the relationship between risk and expected return and that is used in the pricing of risky securities.

The general idea behind CAPM is that investors need to be compensated in two ways: time value of money and risk. The time value of money is represented by the risk-free (rf) rate in the formula and compensates the investors for placing money in any investment over a period of time. The other half of the formula represents risk and calculates the amount of compensation the investor needs for taking on additional risk. This is calculated by taking a risk measure (beta) that compares the returns of the asset to the market over a period of time and to the market premium ( $R_m - r_f$ ). The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free

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security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken. The security market line plots the results of the CAPM for all different risks (betas).

Using the CAPM model and the following assumptions, we can compute the expected return of a stock in this CAPM example if the risk-free rate is 3%, the beta (risk measure) of the stock is 2 and the expected market return over the period is 10%, the stock is expected to return 17% ( $3\% + 2(10\% - 3\%)$ ).



Example: The Blue Dog Company has common stock outstanding that has a current price of \$20 per share and a \$0.5 dividend. The expected risk-free rate of interest is 2.5%, whereas the expected market premium is 5%. The beta on Blue Dog's stock is 1.2. What is the cost of equity for Blue Dog using the capital asset pricing model?

$$RE = RF + BETA(RM - RF)$$

$$re = 0.025 + (0.05) 1.2 = 0.025 + 0.06 = 8.5\%$$

Where

(RM-RF) is Premium.



Example: Suppose a company uses only debt and internal equity to finance its capital budget and uses CAPM to compute its cost of equity. Company estimates that its WACC is 18%. The capital structure is 75% debt and 25% internal equity. Before tax cost of debt is 12.5 % and tax rate is 20%. Risk free rate is  $r_{RF} = 6\%$  and market risk premium ( $r_m - r_{RF}$ ) = 8%.

What is the beta of the company?

$$RE = RF + BETA (RM - RF)$$

$$\% re = 18\% = r_{RF} + \text{beta} (r_m - r_{RF})$$

$$18\% = 6\% + \text{beta}(8\%) = 1.5$$

### Problems of CAPM

This model presents a very simple theory that delivers a simple result. The theory says that the only reason an investor should earn more, on average, by investing in one stock rather than another is that one stock is riskier. Not surprisingly, the model has come to dominate modern financial theory. But does it really work?

It's not entirely clear. The big sticking point is beta. When Professors Eugene Fama and Kenneth French looked at share returns on the New York Stock Exchange, the American Stock Exchange and Nasdaq between 1963 and 1990, they found that differences in betas over that lengthy period did not explain the performance of different stocks. The linear relationship between beta and individual stock returns also breaks down over shorter periods of time. These findings seem to suggest that CAPM may be wrong. While some studies raise doubts about CAPM's validity, the model is still widely used in the investment community. Although it is difficult to predict from beta how individual stocks might react to particular movements, investors can probably safely deduce that a portfolio of high-beta stocks will move more than the market in either direction, and a portfolio of low-beta stocks will move less than the market.

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The capital asset pricing model is by no means a perfect theory. But the spirit of CAPM is correct. It provides a usable measure of risk that helps investors determine what return they deserve for putting their money at risk.

## 9.8 Cross-Border Listings of Stocks

Cross-border listings of stocks benefit a company in the following ways.

- The company can expand **its potential investor base**, which will lead to a higher stock price and lower cost of capital.
- Cross-listing creates a secondary market for the company's shares, which facilitates raising new capital in foreign markets.
- Cross-listing can enhance the liquidity of the company's stock.
- Cross-listing enhances the visibility of the company's name and its products in foreign marketplaces

Cross-border listings of stocks do carry costs.

- It can be costly to meet the disclosure and listing requirements imposed by the foreign exchange and regulatory authorities.
- Once a company's stock is traded in overseas markets, there can be volatility spillover from these markets.
- Once a company's stock is made available to foreigners, they might acquire a controlling interest and challenge the domestic control of the company.

On average, cross-border listings of stocks appear to be a profitable decision. The benefits outweigh the costs.

Cost

- How a firm's cost of capital may decrease when the firm's stock is cross-listed on foreign stock exchanges
- If a stock becomes internationally tradable upon overseas listing, the required return on the stock is likely to go down because the stock will be priced according to the international systematic risk rather than the local systematic risk.
- It is well known that for a typical stock, the international systematic risk is lower than the local systematic risk.

### Capital Asset Pricing Under Cross-Listings

Recall the definition of beta:

$$b_i = \frac{\text{Cov}(R_i, R_M)}{\text{Var}(R_M)}$$

$$\text{Var}(R_M)$$

We can recalibrate the CAPM formula

$$R_i = R_f + b_i(R_M - R_f)$$

As:

$$R_i = R_f + (R_M - R_f) \times \frac{\text{Cov}(R_i, R_M)}{\text{Var}(R_M)}$$

$$\text{Var}(R_M)$$

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We can develop a measure of aggregate risk aversion,  $A^M$

$$A^M = \frac{RM - Rf}{\text{Var}(R_M)}$$

$$\text{Var}(R_M)$$

- We can restate the CAPM using  $A^M$

$$R_i = R_f + A^M \text{Cov}(R_i, R_M)$$

$$R_i = R_f + A^M \text{Cov}(R_i, R_M)$$

This equation indicates that, given investors' aggregate risk-aversion measure, the expected rate of return on an asset increases as the asset's covariance with the market portfolio increases.

In fully integrated capital markets, each asset will be priced according to the world systematic risk.

$$R_i = R_f + A^W \text{Cov}(R_i, R_W)$$

**The CAPM Extended to an International Context**

The extended CAPM is similar to the domestic CAPM, but the world market portfolio replaces the domestic market portfolio. The domestic CAPM extension can be justified only with the addition of two unreasonable assumptions:

- Investors throughout the world have identical consumption baskets.
- Real prices of consumption goods are identical in every country. In other words, purchasing power parity holds exactly at any point in time.
- The risk-pricing expression for the ICAPM is that the expected return on an asset is the sum of the risk-free rate plus the market risk premium plus various currency risk premiums.

$$E(R_i) = R_0 + \beta_{i,w} * RP_w + \sum Y_{i1} * SRP$$

- $RP_w$  is the world market risk premium and  $SRP$  are the currency risk premiums.

**ICAPM v/s Domestic CAPM**

The ICAPM differs from the domestic CAPM in two respects:

- The relevant market risk is world (global) risk, not domestic market risk.
- Additional risk premiums are linked to an asset's sensitivity to currency movements. The different currency exposures of individual securities would be reflected in different expected returns. A summary of current research tends to support the conclusion that assets are priced in an integrated global financial market.
- The evidence is sufficiently strong to justify using the ICAPM as an anchor in structuring global portfolios. However, the evidence can be somewhat different for emerging smaller markets, in which constraints are still serious.

**Summary**

Capital budgeting plays an important role in the survival and growth of the organization. It enables to take decisions which have long term strategic implications. There are several techniques which are non-discounted like payback and accounting rate of return and others which are discounted approach like net present value, profitability index and internal rate of return. The project is evaluated, and decisions are taken whether to accept the project and reject the project. Cost of

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capital also plays an important criterion for the project. Debt and equity both have its own cost and benefits.

Capital asset pricing model describes the relationship between risk and expected return and that is used in the pricing of risky securities. The model can be extended to international level with some difference from domestic level.

### Keywords

**Capital budgeting:** It is the process through which different projects are evaluated and the process is known as capital budgeting.

**NPV:** It is the sum of the discounted cash flows minus the original investment.

**Internal Rate of Return:** It is that rate at which the sum of discounted cash inflows equals the sum of discounted cash outflows. It is the rate of discount which reduces the NPV of an investment to zero.

**Cost of capital:** The cost of capital is the minimum required rate of earning or cut off rate of capital expenditure.

**Adjusted Present Value:** APV is used for the valuation of projects and companies. It takes the net present value (NPV), plus the present value of debt financing costs, which include interest tax shields, costs of debt issuance, costs of financial distress, financial subsidies, etc.

### Self Assessment

1. The cost of capital is the -----or cut off rate of capital expenditure
  - A. Minimum required rate of earning
  - B. Maximum required rate of earning
  - C. Constant required rate of earning
  - D. Types of Capital Issued by a Company
  
2. Capital Budgeting is a part of
  - A. Investment Decision
  - B. Working Capital Management I
  - C. Marketing Management ,
  - D. Both A and B
  
3. Capital Budgeting deals with
  - A. Long-term Decisions
  - B. Short-term Decisions
  - C. Both (a) and (b)
  - D. D Neither (a) nor (b)
  
4. Capital Budgeting Decisions are generally
  - A. Reversible
  - B. Irreversible
  - C. Unimportant
  - D. All of the above

5. A proposal is not a Capital Budgeting proposal if it -
- A. Is related to Fixed Assets
  - B. Brings long-term benefits
  - C. Brings short-term benefits only
  - D. Has very large investment
6. Accept the project when NPV is -----
- A. Positive
  - B. Negative
  - C. Equal
  - D. None of the above
7. Reject project when NPV is -----
- A. Positive
  - B. Negative
  - C. Equal
  - D. None of the above
8. Capital budgeting for subsidiary projects be assessed from the parent's perspective
- A. True
  - B. False
  - C. Dependent on market
  - D. None of the above
9. The greater the uncertainty about a project's forecasted cash flows, the -----  
----- should be the discount rate applied to cash flows, other things being equal.
- A. Larger
  - B. Smaller
  - C. Equal
  - D. Not Applicable
10. A project whose cash flows are more than capital invested for rate of return then net present value will be
- A. Positive
  - B. Negative
  - C. All facts are not given
  - D. Not Applicable
11. An MNC has total assets of \$100 million and debt of \$20 million. The firm's before-tax cost of debt is 12 percent, and its cost of financing with equity is 15 percent. The MNC has a corporate tax rate of 40 percent. What is this firm's weighted average cost of capital?
- A. 13.44%
  - B. 16.45%

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- C. 15.5%
- D. Not Applicable
12. Sensitivity analysis can be more useful than simple point estimates because it reassesses the project based on various circumstances that may occur. Many computer software packages are available to perform sensitivity analysis.
- A. True
- B. False
13. In segmented capital markets, the cost of capital will be determined essentially by the securities' domestic systematic risks. In integrated capital markets, on the other hand, the cost of capital will be determined by the securities' world systematic risk, regardless of nationality.
- A. True
- B. False
14. A risk-averse investor will select a high-variance portfolio only if the expected excess return is sufficiently high.
- A. True
- B. False
15. The CAPM says that the expected return of a security or a portfolio equals the rate on a risk-free security plus a risk premium. If this expected return does not meet or beat the required return, then the investment should not be undertaken. .
- A. True
- B. False

**Answers for Self Assessment**

1. A      2. A      3. A      4. B      5. C
6. A      7. B      8. A      9. A      10. A
11. A      12. A      13. A      14. A      15. A

**Review Questions**

- 1) Discuss in brief meaning and features of capital budgeting.
- 2) Discuss in brief discounted and Non discounted methods of capital budgeting..
- 3) Discuss in brief Accounting rate of return method of capital budgeting. What are the acceptance rule and limitation of this method?
- 4) Discuss in brief Net Present Value method of capital budgeting. What are the acceptance rule and advantages of this method?

**Further Readings**

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**Web Links**

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**Unit 10: Working Capital Management of the Multinational Firm****CONTENTS**

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**Objective**

- understanding the concept of working capital management.
- Interpreting components of International working capital management.
- interpret the advantages of centralization versus decentralisation of cash management.
- interpret the Bilateral netting and Multilateral netting.

**Introduction**

The management of current assets and current liabilities constitutes working capital management.

The efficient allocation of funds among various current assets and the acquisition of short-term funds on favorable terms are conceptually the same for both multinational companies (MNCs) and domestic companies.

**10.1 What is Working Capital?**

Traditionally, working capital has been defined as the firm's investment in current assets. Current assets are required to be maintained for day-to-day operations of the firm. The assets keep changing from one form to another from stocks, receivables and cash. Working capital decisions are of tremendous importance for any firm because such decisions affect the business's liquidity position.

**Features of Working Capital Decisions**

Working capital decisions are typically

- Short-term financial decisions, i.e., working capital decisions typically affect the cash flows of the firm for a shorter time frame, extending up to a maximum of one year, normally.
- The concepts of risk and time value of money are less pertinent to working capital decision-making.

- They are modified from time to time unlike capital budgeting decisions, which are one-time.
- Concept of working capital is dynamic as market conditions with respect to credit, stocking etc. change more frequently.

There are two possible interpretations of working capital concept:

- Balance sheet concept
- Operating cycle concept

#### **Balance sheet concept**

There are two interpretations of working capital under the balance sheet concept.

1. Excess of current assets over current liabilities or Net Working Capital
2. Gross Working Capital-total current assets.

#### **Gross Working Capital**

Gross working capital (GWC) is defined as investment in current assets.

Net working capital (NWC) is defined as excess of current assets over current liabilities.

Both concepts (GWC and NWC) are equally important in the management of working capital, as both are related.

One is a measure of the level of current assets while the other measures the extent to which long-term sources of financing have been used to finance current assets.

Increasing GWC affects profitability adversely as more funds get tied up in current assets that have low/zero yield.

#### **Net Working Capital (NWC)**

Net Working capital (NWC) refers to the difference between current assets and current liabilities (CA - CL).

This differential denotes that part of current assets which is financed by long-term sources of financing.

It is referred to as the accountant's definition of working capital.

An increasing NWC indicates an improving liquidity position of the firm.

#### **Operating Cycle**

Operating cycle refers to the time elapsed between procurement of raw material to realization of cash from the finished goods.

Operating cycle and its management assumes significance in the context of working capital management.

Larger the operating cycle, larger is the requirement of working capital.

#### **Working Capital and Operating Cycle**

Cash Cycle= Operating Cycle - Credit period availed

Working capital is function of:

- Length of operating/cash cycle: Longer the operating/cash cycle larger is working capital required.

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- Level of operation: Higher the level of operation larger is the working capital required.

Formula for Calculation of Operating Cycle

RMCP=  $\frac{\text{Average Raw Material Stock} \times 365 \text{ or } 12}{\text{Total Raw Material Consumption}}$

WPCP=  $\frac{\text{Average Stock of WIP} \times 365 \text{ or } 12}{\text{Total Cost of Production}}$

FGCP=  $\frac{\text{Average Stock of FG} \times 365 \text{ or } 12}{\text{Total Cost of Goods Sold}}$

DCP=  $\frac{\text{Average Debtors} \times 365 \text{ or } 12}{\text{Total Credit Sales}}$

DP=  $\frac{\text{Average Creditors} \times 365 \text{ or } 12}{\text{Total Credit Purchases}}$

OC = RMCP+WPCP+FGCP+DCP

NOC= RMCP+WPCP+FGCP+DCP - DP

## **10.2 Multinational Working Capital Management**

Multinational working capital management is the management of current assets and current liabilities of any multinational company who has large number of branches and subsidiaries in different countries.

In simple words, management of inventory, cash, short term investments, creditors and currency exchange risks. By managing this, multinational company can reduce its cost and increase the money for paying day to day expenses.

### **1. Inventory Management**

Inventory management means to reduce the carrying and holding cost of inventory. At international level, company has to take following decisions.

- What is the quantity of production?
- Where will it produce its goods?
- From where will it buy the raw material?
- Which transport will it use for transferring goods?
- Where will it store its products?

For getting answer of all these questions, multinational company has to analyze its past records. Quantity of production depends on the demand of customers. Past sales records of its different branches will be helpful better financial decision relating to the quantity of production.

Company should produce near the location of production. But it also see the labor cost and other overhead cost as it affect the production location. After analyzing the labor cost, delivery cost, raw material availability and other overhead cost, company has to take this decision.

### **2. Cash Management**

Company can use centralized cash management system and decentralized cash management system. Every transaction relating to receipt and payment is recorded. In centralized cash management system, all cash is collected in head office. Only authorized order, cash is issued from head office. Through cash pooling company can use CCM better way.

In this system, company's cash is deposited in their local financial institutions and banks from different branches. Financial institute or bank converts all cash into pool. So, without paying any

fees, any bank uses this fund. There is also not any low balance problem. Because other branch's fund can easily be used for payment.

### 3. **Currency Risk Management**

In multinational currency management, currency risk will effect. If home currency will weak and other country's currency will strong, it will affect your total calculation of working capital.

For example, you have to pay your one employee 1000 \$ in Indian currency, it is your current liability. Today exchange rate is Rs. 50/ 1 \$. For this, you have to pay Rs. 50,000. Suppose, you have deposited Rs. 50,000 in Indian bank for paying your Indian employees, but due to Indian currency fluctuation, exchange rate becomes Rs. 55/ 1\$.

It means, you have to pay more Rs. 5000. This Rs. 5000 is your loss due to currency rate changes and your liability may be increased or reduced. By using inter-currency transactions and hedging, you can control the effect of changes in currency rates.

### 4. **Current Liabilities Management**

Every branch's current liabilities may be different from other branch. There should be proper rules for paying within the time limit. Optimize and improvement in payment process will increase your working capacity.

In India, multinational company uses line of credit for paying its small expenses. With this, interest is charged only when the money is withdrawal for paying expenses.

## **10.3 International Cash Management.**

Cash Management in an MNC is primarily aimed at minimizing the overall cash requirements of the firm as a whole without adversely affecting the smooth functioning of the company and each affiliate, minimizing the currency exposure risk, minimizing political risk, minimizing the transaction costs and taking full advantage of the economies of scale as also to avail of the benefit of superior knowledge of market forces.

Complexities of International Cash Management

- Different economic and monetary environment
- Different banking practices
- Tax implications
- Communications infrastructure
- Cultural differences
- Legal and regulatory barriers
- Language barriers

### **What is Cash?**

In narrow sense: currency and generally accepted equivalents of cash like cheques, drafts etc.

In broad sense: includes near-cash assets, such as marketable securities and time deposits in banks.

- They can be readily sold and converted into cash.
- Can serve as a reserve pool of liquidity.
- Also, provide a short term investment outlet for excess cash.

### **Management of cash includes:**

- Determination of the optimum amount of cash required in the business.
- To keep the cash balance at an optimum level and investment of surplus cash in a profitable manner.
- Prompt collection of cash from receivables and efficient disbursement of cash.

## 10.4 Four Facet of Cash Management

1. Cash planning
2. Managing the cash flows
3. Optimum cash level
4. Investing surplus cash

### Motives of Holding Cash

**Transaction motive:** Holding of cash to meet routine cash requirements to finance the transactions which a firm carries on in the ordinary course of business. Cash is held to pay for goods or services. It is useful for conducting our everyday transactions or purchases.

**Precautionary motive:** The cash balances held in reserve for random and unforeseen fluctuations in cash flows. A cushion to meet unexpected contingencies. Defensive in nature

- Floods, strikes and failure of imp customers
- Unexpected slowdown in collection of accounts receivable
- Sharp increase in the cost of raw materials
- Cancellation of some orders of goods

**Speculative motive:** Is a motive for holding cash/near-cash to quickly take advantage of opportunities typically outside the normal course of business.

Helps to take advantage of:

- An opportunity to purchase raw materials at a reduced price.
- Make purchases at favorable prices.
- Delay purchase in anticipation of a decline in prices.
- Buying securities when the interest rate is expected to decline.

**Compensating motive:** Is a motive for holding cash/near-cash to compensate banks for providing certain services or loans. Clients are supposed to maintain a minimum balance of cash at the bank which they cannot use themselves.

### Managing Cash Flows

After estimating cash flows, efforts should be made to adhere to the estimates of receipts and payments of cash. Management of cash will be successful only if cash collections are accelerated and cash payments (disbursements), as far as possible, are delayed.

### Methods of Accelerating Cash Inflows

- Prompt payment from customers (Debtors).
- Quick conversion of payment into cash.
- Decentralized collections
- Lock Box System (collecting centers at different locations).

### Methods of Decelerating Cash Outflows

- Paying on the last date.
- Payment through Cheques and Drafts.
- Adjusting Payroll Funds (Reducing frequency of payments).
- Centralization of Payments.
- Inter-bank transfers.
- Making use of Float.

### Cash Management Models

A number of mathematical models have been developed to determine the optimal cash balance.

Two of such models are as follows-

- William J. Baumol's inventory model
- M. H. Miller and Daniel Orr's Stochastic model.

### Baumol's Model of Cash Management

This model trades off between opportunity cost or carrying cost or holding cost & the transaction cost. As such a firm attempts to minimize the sum of the holding cash & the cost of converting marketable securities into cash. Helps in determining a firm's optimum cash balance under certainty.

#### Assumptions

- Cash need of the firm is known with certainty.
- Cash Disbursement over a period of time is known with certainty.
- Opportunity cost of holding cash is known and remains constant.
- Transaction cost of converting securities into cash is known and remains constant.

### Algebraic representation of William J. Baumol's Inventory model

$$C = \sqrt{2A \cdot F / O}$$

C = Optimum Balance

A = Annual Cash Distribution

F = Fixed Cost Per Transaction

O = Opportunity Cost Of Holding

#### Uses

The Baumol's model enables companies to find out their desirable level of cash balance under certainty. The Baumol's model of cash management theory relies on the tradeoff between the liquidity provided by holding money (the ability to carry out transactions) and the interest foregone by holding one's assets in the form of non-interest bearing money. The key variables of the demand for money are then the nominal interest rate, the level of real income which corresponds to the amount of desired transactions and to a fixed cost of transferring one's wealth between liquid money and interest bearing assets.



Example: A company generates \$10,000 per month excess cash, which it intends to invest in short-term securities. The interest rate it can expect to earn on its investment is 5% pa. The transaction costs associated with each separate investment of funds is constant at \$50.

Required:

- What is the optimum amount of cash to be invested in each transaction?
- How many transactions will arise each year?
- What is the cost of making those transactions pa?
- What is the opportunity cost of holding cash pa?

Solution

$$(a) C = \sqrt{(2 * 50 * 10000 * 12) / 0.05} = \$15,492$$

$$(b) \text{ Number of transactions pa} = 120,000 / 15,492 = 7.75$$

$$(c) \text{ Annual transaction cost} = 7.75 * \$50 = \$387$$

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(d) Annual opportunity cost (holding cost)

$$= 5\% \times 15,492 / 2 = \$387$$

### The Miller and Orr Model of Cash Management

The Miller and Orr model of cash management is one of the various cash management models in operation. It is an important cash management model as well. It helps the present day companies to manage their cash while taking into consideration the fluctuations in daily cash flow.

As per the Miller and Orr model of cash management the companies let their cash balance move within two limits a) Upper Control limit b) Lower Control Limit.

Along with a return point when the cash balance touches the upper Control limit (h), the marketable security is purchased to the extent till it reaches normal cash balance (Z).

In the same manner, when the cash balance touches the lower limit (o), the firm will sell the marketable security to the extent till it reaches normal cash balance (Z).

Computation of Miller - Orr Model of Cash Management Spread (Z)

- Spread (Z) =  $3(3/4 * \text{Transaction cost} * \text{Variance of Cash Flow})^{1/3}$

Interest rate

- Return Point = Lower limit + Spread (Z)/3
- Variance of Cash Flow = (Standard deviation)<sup>2</sup> or (s)<sup>2</sup>



Example: The minimum cash balance of \$20,000 is required at Miller-Orr Co, and transferring money to or from the bank costs \$50 per transaction. Inspection of daily cash flows over the past year suggests that the standard deviation is \$3,000 per day, and hence the variance (standard deviation squared) is \$9 million. The interest rate is 0.03% per day.

Calculate:

- i. the spread between the upper and lower limits
- ii. the upper limit
- iii. the return point

- i. Spread =  $3(3/4 \times 50 \times 9,000,000 / 0.0003)^{1/3} = \$31,200$
- ii. Upper limit =  $20,000 + 31,200 = \$51,200$
- iii. Return point =  $20,000 + 31,200 / 3 = \$30,400$

### Evaluation of the Model

- This Stochastic model can be employed even in extreme uncertainty.
- When the cash flow fluctuates violently in short period it will give optimal result.
- Finance Manager can apply this model in highly unpredictable situation.

### Techniques to Optimize Cash Flows

- Accelerating cash inflows.
- Minimizing currency conversion costs.
- Minimizing the tax on cash flow.
- Managing blocked funds.
- Managing inter-subsidary cash transfers.

### Accelerating Cash Inflows



- The more quickly the inflows are received, the more quickly they can be invested or used for other purposes.
- MNC may establish lockboxes around the world.
- Preauthorized payment, which allows a corporation to charge a customer's bank account up to some limit.

**Minimizing Currency Conversion Costs**

- Netting, be implemented with the joint effort of subsidiaries or by the centralized cash management group.
- Bilateral netting system and multilateral netting system.
- There can be some limitations to multilateral netting due to foreign exchange controls.

**Minimizing Tax on Cash Flow**

- MNC must consider the tax consequences of altering its cash flow.
- Another possible strategy to deal with such high taxation is to adjust the transfer pricing policy.
- Financing strategy may be used to deal with high taxation.

**Managing Blocked Funds**

- The subsidiary may be instructed by the MNC to set up a research and development division.
- The parent may instruct the subsidiary to obtain financing from a local bank rather than from the parent.
- Host a corporate meeting in local place.

**Inter-Subsidiary Cash Transfers**

- The subsidiary could provide financing by paying its suppliers earlier than necessary.
- The MNC could provide financing by allowing its subsidiary to lag its payments.
- The leading or lagging strategy can make efficient use of cash and therefore reduce debt.

**10.5 Cash Management : A Global Perspective**

Cash management like any other function can be examined from two perspectives: an intra-country perspective and an inter-country perspective. Intra-country cash management deals with the payment systems, banks, investments and borrowing sources available in a particular country. Inter-country cash management deals with cash movement among several countries.

The key conceptual difference between intra-country cash management and inter-country cash management is foreign exchange. As corporations continue to expand their operations beyond their resident borders and money and foreign exchange markets remain volatile, managing cash resources globally increases in importance.

The objectives, thus, of effective cash management in an international environment are:

1. To allocate short-term investments and cash balance holdings between currencies and countries to maximize overall corporate returns; and
2. To borrow in different money markets to achieve the minimum cost.

These objectives are to be pursued under the conditions of maintaining required liquidity and minimizing any risks that may be incurred.

**Centralized Cash Management**

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Cash may be managed at one central location or at different locations i.e. it may be centralised or decentralised. Sometimes, it is felt that it is necessary for each operating unit to deal with one central point rather than each other. The logic is that only a central unit can keep track of net amounts that a unit should pay or receive.

### **Advantage of Centralized Cash Management**

#### **Netting:**

It is extremely common for multinational firms to have divisions in different countries, each having accounts receivable and accounts payable, as well as other sources of cash inflows and outflows, denominated in several currencies.

Netting supports companies in making their cash management more efficient and less costly by:

- Boosting cash flow efficiency,
- Consolidating invoices and enabling faster cash allocation,
- Allowing companies to better calculate their FX exposure and hedge it strategically.
- If the divisions are left to manage their own cash, it can happen, for example, that one division is hedging a long pound position while at the same time another division is hedging a short pound position of the same maturity.
- This situation can be avoided by netting, which involves calculating the overall corporate position in each currency. The calculation requires some central coordination of cash management.

#### **Currency Diversification:**

When cash management is centralised, it is possible not only to net inflows and outflows in each separate currency, but also to consider whether the company's foreign exchange risk is sufficiently reduced via diversification that the company need not hedge all the individual positions. The diversification of exchange risk results from the fact that exchange rates do not all move in perfect harmony.

Consequently, a portfolio of inflows and outflows in different currencies will have a smaller variance of value than the sum of variances of the values of the individual currencies. The determination of whether diversification will sufficiently reduce risk can only be made properly when cash management is centralised. The diversification of exchange risk results from the fact that exchange rates do not all move in perfect harmony.

#### **Pooling:**

Pooling occurs when cash is held as well as managed in a central location. The advantage of pooling is that cash needs can be met wherever they occur without having to keep precautionary balances in each country.

Uncertainties and delays in moving funds to where they are needed require that some balances be maintained everywhere, but with pooling, a given probability of having sufficient cash to meet liquidity needs can be achieved with smaller cash holdings than if holdings are decentralised.

### **Why decentralised cash management?**

Unfortunately, it is rarely possible to hold all cash in a major international financial centre. This is because there may be unpredictable delays in moving funds from the financial center to other countries.

If an important payment is due, especially if it is to a foreign government for taxes or to a local supplier of a crucial input, excess cash balances should be held where they are needed, even if these mean opportunity costs in terms of higher interest earnings available elsewhere.

### **Advantage of decentralised cash management**

#### **Transaction costs:**

Transaction costs are a reason for keeping funds in the currency that is received if the funds might be needed later in the same currency.

For example, if a firm receives 2 million won in payment for sales for its subsidiary in South Korea and needs approximately this quantity of won to meet a payment in a month or two, the funds should be left in Korean won if expected yields are not sufficiently higher in other currencies the two sets of transaction costs.

**Political risk:**

Political risk is a reason to keep funds in the company's home currency rather than in the country in whose currency the funds are denominated. This is because the home jurisdiction is generally the most friendly one.

The reduction in political risk that results from moving funds home must, of course, be balanced against the extra costs this entails when the funds are converted into domestic currency and therefore must later be converted back into the foreign currency.

**Liquidity:**

Liquidity considerations argue in favor of keeping funds in the currency in which they are most likely to be needed in the future. This might not be the currency in which the funds arrive or the company's home currency.

The liquidity factor is hence different from transaction costs, which suggest that funds should be kept in the currency in which they arrive, and it is also different from political risk, which suggest that funds should be kept at home.

**Withholding taxes:**

Withholding taxes are a reason to avoid countries whose withholding rates exceed the investor's domestic tax rate, because in such a case it will not in general be possible to receive full withholding tax credit. Lower taxes on foreign exchange gains than on interest income are a reason to invest in countries whose currencies are at a forward premium if the premium is treated as a capital gain.

**Centralisation versus decentralisation**

According to PwC's Global Corporate Treasury Benchmarking Survey 2017, 83% of more than 200 corporates surveyed told researchers they'd introduced a dedicated central treasury department to better manage cash, investment, foreign exchange (FX) and other key strategic financial decisions. Despite this core focus on centralization, 65% of teams involved in treasury processes said they're still distributed across a variety of departments within their respective enterprise.

Yet while there are several key advantages multinational companies (MNCs) tend to enjoy by centralising treasury function, increasing socio-political uncertainty surrounding events like Brexit, rapid regulatory change in Asia and the rise of protectionist legislative policy across various markets has also extended credibility for a more decentralised treasury model for industries and regions.

In some cases, business forecasters are even calling upon treasurers to implement strategies that incorporate elements of both centralization and decentralisation.

**What are the most effective centralised treasury structures?**

The most efficient centralised treasury structures tend to slot within at least one of three categories-

- The first category is re-invoicing centres. These centres are established with a view to invoice local entities centrally, and then handle purchasing from a larger parent company located elsewhere. When using the re-invoicing centre model, purchases are ordinarily made in the currency of the parent entity, while sales to local entities are subsequently made in either a parent currency or through localised currencies.
- The second type of centralised structure organisations choose to pursue is to establish regional treasury and finance centres. These centres are typically established with a view to allow a single centre to manage the FX exposure for all regional entities. Using this structure,

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FX trading can be carried out centrally or in the name of the local entity within each particular market – which potentially makes this structure a bit of a halfway house between centralisation and decentralisation in treasury.

- The third centralised treasury structure organisations opt for is the SSC. Shared service centres are effectively a top tier model as they not only centralise treasury function, but also key accounting functions like payables and receivables for all regional and global entities. Using SSCs, organisations outsource domestic collections and payments to a cash management bank or monitor and execute them internally.

### **Combining centralisation and decentralisation in treasury**

Although treasury has experienced a massive shift towards centralisation over the course of the last decade, changing market conditions and evolving business needs mean some MNCs aren't necessarily able to pick and choose between centralisation or decentralisation.

Instead, some organisations are opting for a 'centrally decentralised' method of treasury management that empowers local teams to make rapid decisions, while also enhancing group-wide security and compliance through centralised monitoring.



#### Example of Combining centralisation and decentralisation in treasury

One example of a successful execution of this hybrid method is the German manufacturer Wacker Neuson, which teamed up with treasury solutions provider Bellin to develop a structure enabling the firm to mitigate global challenges as well as meet specific local requirements to boost efficiency and treasury visibility around payments and reporting.

To do this, Wacker Neuson invested in a global treasury platform capable of standardising payments formats and communication channels, while simultaneously consolidating localised solutions and channels being utilised by knowledgeable regional teams.

By removing specific payment format dialects for each country and bank and integrating domestic and international payments via its new group platform, Wacker Neuson now benefits from the power of a centralised treasury platform while still preserving the semi-autonomous efficiencies local teams had previously enjoyed as part of a more decentralised treasury model.

### **Summary**

Working capital is one of the important factors for success of the organisations. The main classification of working capital is gross and net working capital with operating cycle concepts. Multinational working capital management involves management of working capital across various branches of all locations.

Cash management is also important aspect for the organization success. There are motives for holding cash in the organization like transaction, precautionary, speculative and compensating motive. A number of mathematical model have been to develop to determine the optimal cash balance. Two models for cash management are William J. Baumol's inventory and Miller and I Orr's stochastic model.

Centralised and decentralised form of cash management has its own advantage and disadvantages. Organization is combining the features of both methods.

### **Keywords**

Gross working capital: It is defined as investment in current assets.

Net working capital: It is defined as excess of current assets over current liabilities.

Operating cycle: It refers to the time elapsed between procurement of raw material to realization of cash from the finished goods.

Netting: It involves calculating the overall corporate position in each currency. The calculation requires some central coordination of cash management.

Pooling: It occurs when cash is held as well as managed in a central location. The advantage of pooling is that cash needs can be met wherever they occur without having to keep precautionary balances in each country.

Compensating motive: Is a motive for holding cash/near-cash to compensate banks for providing certain services or loans.

### **Self Assessment**

1. Working capital decisions are typically
  - A. Short-term financial decisions
  - B. Modified from time to time
  - C. Both a and b
  - D. Not Applicable
  
2. Excess of current assets over current liabilities is known as-----.
  - A. Gross Working capital
  - B. Net Working capital
  - C. Both of the above
  - D. Not Applicable
  
3. Higher the level of operation -----is the working capital required.
  - A. Larger
  - B. Smaller
  - C. Medium
  - D. Not Applicable
  
4. Lower the level of operation -----is the working capital required.
  - A. Larger
  - B. Smaller
  - C. Both of the above
  - D. None of the above
  
5. ----- require a firm to conduct its business in the ordinary course
  - A. Transaction Motive
  - B. Precautionary Motive
  - C. Both of the above
  - D. None of the above
  
6. -----for investment in profit making opportunities as and when arise.
  - A. Transaction Motive
  - B. Precautionary Motive
  - C. Speculative Motive
  - D. None of the above

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7. Floods, Strike and failure of important customer are the part of which motive of holding cash?
- A. Transaction Motive
  - B. Precautionary Motive
  - C. Does not effect
  - D. Not Applicable
8. Centralization of Payments can be one of the methods of.
- A. Accelerating cash flow
  - B. Decelerating cash flow
  - C. Both of the above
  - D. Not Applicable
9. Decentralized collections can be one of the methods of
- A. Accelerating cash flow
  - B. Decelerating cash flow
  - C. Both of the above
  - D. Not Applicable
10. Which of the following is not a motive to hold cash?
- A. Transaction Motive
  - B. Precautionary Motive
  - C. Capital Investment
  - D. Not Applicable
11. -----is defined as investment in current assets.
- A. Gross Working capital
  - B. Net Working capital
  - C. Does not effect
  - D. Not Applicable
12. Current assets refer to those assets which in the ordinary course of business can be, or will be, converted into cash within one year without undergoing a diminution in value and without disrupting the operations of the firm.
- A. True
  - B. False
13. Operating cycle refers to the time elapsed between procurement of raw material to realization of cash from the finished goods.
- A. True
  - B. False

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14. When there is short working capital there are chances that favorable market condition cannot be exploited by the organization.

- A. True
- B. False

15. The longer the length of operating cycle, the higher the requirement for working capital and vice versa.

- A. True
- B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. C  | 2. B  | 3. A  | 4. B  | 5. A  |
| 6. C  | 7. B  | 8. B  | 9. A  | 10. C |
| 11. A | 12. A | 13. A | 14. A | 15. A |

**Review Questions**

1. Differentiate between speculative and transaction motive of holding cash.  
What do you mean by Working Capital? Mention various factors that affect working capital?
2. What is the importance of cash Management in the organization? Explain various objectives of cash management?  
Explain the concept of Operating cycle concept.
3. What are the various methods to Accelerate and decelerate cash flow?

**Further Readings**

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## Unit 11:Option Contracts

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### Objective

- meaning and concept of options
- assess the concept of options for controlling risk,
- analyze different strategies for reducing risk.
- analyze various types of hedging.

### Introduction

Options have become remarkably popular instrument which far from being confined solely to the institutions and professional money managers, options trading is now mainstream for “retail” traders from all walks of life. The fact is you need to have a trading plan that works. It needs to keep your risk low and your potential for reward high.

Options are unique instruments that confer right to buy/sell an asset at predetermined price but create no obligation to do so. Forwards and futures are the contracts that create mutual and equal obligations on both the parties, that is binding. Options create obligation on one party while confer a right on another.

### 11.1 Option concept

Options give you the ability to do so many things – they enable you to configure your investment aims in any way you like. Options have become remarkably popular instrument which far from being confined solely to the institutions and professional money managers, options trading is now mainstream for “retail” traders from all walks of life. The fact is you need to have a trading plan that works. It needs to keep your risk low and your potential for reward high. Options give you the ability to do so many things – they enable you to configure your investment aims in any way you like.



Option enables to

- **Control more assets for less money:** For example, ABCD stock is priced at \$26.20 on June 2, 2021. An option to buy ABCD shares (a call option) might be priced at 2.60. Because one contract represents 100 shares, you can therefore buy one ABCD call contract for \$260.00 [ $100 \times 2.60$ ]. The alternative would be to buy 100 shares of the stock for a total sum of \$2,620. So, in this example, you can buy ABCD call options for around 10% of the stock price in order to control \$2,620 of ABCD stock until the appropriate expiration date of the option.
- **Trade with leverage:** Because the cost basis is so low, the position is much more sensitive to the underlying stock's price movements, and hence your percentage returns can be so much greater.
- **Trade for income:** You can design strategies specifically for the purpose of generating income on a regular basis.
- **Profit from declining stocks:** You can use puts and calls to ensure that you can make money if the stock goes up, down, or sideways.
- **Profit from volatility or protection against various factors:** Different options strategies protect you or enable you to benefit from factors such as time decay, volatility, lack of volatility, and more.
- **Reduce or eliminate risk:** Options enable you to substantially reduce your risk of trading, and in certain rare cases, you can even eliminate risk altogether, albeit with the trade-off of very limited profit potential.

## 11.2 Terminologies of options

The main types of call and put option are

**Call Option:** A right to BUY the underlying asset at predetermined price within specified interval of time is called a CALL option. A right to buy a share of Reliance at say Rs 2,000 in 3 months is a call option.

**Put Option:** A right to SELL the underlying asset at predetermined price within specified interval of time is called PUT option. A right to sell a share of Reliance at say Rs 2,000 in 3 months is a put option.

The buyer and seller of option are

**Buyer or Holder:** The person who obtains the right to buy or sell but has no obligation to perform is called the owner/ holder of the option.

**Writer or Seller:** One who confers the right and undertakes the obligation to the holder is called seller/writer of an option.

### **Option premium**

While conferring a right to the holder, who is under no obligation to perform, **the writer is entitled to charge a fee upfront. This upfront amount is called the premium.** Premium is paid by holder to the writer to induce him to grant the right. The amount belongs to writer irrespective of whether the option is exercised or not. Premium is not adjustable against the future payment that arise upon exercise of option.

### **Strike Price**

The predetermined price at the time of buying/writing of an option at which it can be exercised is called the strike price. It is the price at which holder of an option buys/sells the asset.

**Strike Date/Maturity Date**

The right to exercise the option is valid for a limited time. The latest time when the option can be exercised is called the time to maturity. It is also referred to as expiry/maturity date.

**Call option**

A call option is a right but no obligation to buy an asset at a predetermined price within the specified time. The holder of a call option exercises the option when the price of the underlying asset is more than the strike price.

If the spot price is less than the strike price, the holder lets the option expire as it is worthless.



Example: Assume that the share of ITC is currently trading at Rs 180. An investor, John, believes that the share is going to rise to at least 220 in the next three months. He buys a call option from Mohammad at Rs 190. John is the holder of the option, while Mohammad is the writer or seller of the option. **Strike price = 190.** He would use this right only when the actual price of ITC moves beyond 190. Suppose it moved to 200, by exercising the option John would gain. In case it falls below 190, John will not exercise it. As long as the price of the underlying asset,  $S$ , remains below the strike price,  $X$ , the buyer of the option will not exercise it,

Profit/Loss

- When  $S < X$  buyer lets the call expire    Loss = Premium
- When  $S = X$  Buyer is indifferent            Loss = Premium

When  $S > X$  Buyer exercises the call option    Gain =  $S - X - C$

**Put Option**

A put option is a right but no obligation to sell an asset at a predetermined price within the specified time. The holder of a put option exercises the option when the price of the underlying asset is less than the strike price. If the spot price is more than the strike price, the holder lets the option expire as it is worthless.



Example: Assume the ITC is currently trading at 180. John is expecting it to fall to 150. He purchased a put option at 175. John would exercise his option when it is profitable. The option would become profitable when the actual price of ITC share falls below 175, like it moves to 160.

Profit/Loss

- When  $S < X$  buyer exercises the option    Gain =  $X - S - C$
- When  $S = X$  Buyer is indifferent            Loss = Premium
- When  $S > X$  Buyer lets the contract expire    Loss = Premium

Summary breakdown of buying vs. selling options

Buying a Call: You have the right to buy a security at a predetermined price. Selling a Call: You have an obligation to deliver the security at a predetermined price to the option buyer if they exercise the option.

**Moneyness of the options:** Moneyness of the option tells the benefit the holder gets if he exercises the option.

- Call option is in the money when the spot price is more than the exercise price.

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- Put option is in the money when the spot price is less than the exercise price.

Call option works the way:

- A call is ITM when the underlying asset price is greater than the strike price.
- A call is OTM when the underlying asset price is less than the strike price.
- A call is at-the-money (ATM) when the underlying asset price is the same as the strike price.

Put options work the opposite way:

- A put is ITM when the underlying asset price is less than the strike price.
- A put is OTM when the underlying asset price is greater than the strike price.
- A put is ATM when the underlying asset price is the same as the strike price.

### Types of options - Basis of expiry

Further the Options are classified based on type of exercise. At present the Exercise style can be European or American-

- American Option - American options are options contracts that can be exercised at any time up to the expiration date.
- European Options - European options are options that can be exercised only on the expiration date.

Terminal Payoff of European option with maturity T:

	Call	Put
Long	$\text{Max}(S_T - K, 0)$	$\text{Max}(K - S_T, 0)$
Short	$-\text{Max}(S_T - K, 0)$	$-\text{Max}(K - S_T, 0)$

### Key Differences

- European options are traded at a lower volume when compared to American options since they are traded heavily.
- European options are traded at a lower volume when compared to American options since they are traded heavily.
- The premium of a European option is low, and the premium of an American option is high since it allows the liberty to the option holder to exercise the Option at any time before the expiration date.
- Since an American option can be exercised at any time, the risk is higher, whereas a European option that can only be exercised on a particular future date has less risk.

Currency options

Currency options give investors the right, but not the obligation, to buy or sell a particular currency at a pre-specific exchange rate before the option expires.

Currency options allow traders to hedge currency risk or to speculate on currency moves.

Currency options come in two main varieties, so-called vanilla options and over-the-counter SPOT options.



Example of a Currency Option

Let's say an investor is bullish on the euro and believes it will increase against the U.S. dollar. The investor purchases a currency call option on the euro with a strike price of \$115, since currency prices are quoted as 100 times the exchange rate. When the investor purchases the contract, the spot rate of the euro is equivalent to \$110.



#### Example of a Currency Option

Assume the euro's spot price at the expiration date is \$118. Consequently, the currency option is said to have expired in the money. Therefore, the investor's profit is \$300, or  $(100 * (\$118 - \$115))$ , less the premium paid for the currency call option.

### 11.3 Option Pricing

Determination of option premium has been major area of research. Options are uneven contracts that give right to one i.e. the holder or buyer while create obligation on the other party i.e. writer or seller of a contract.

Buyer cannot enjoy the right free of cost else it becomes a lop-sided contract. Buyer of the right has to induce the writer to confer such right on him and undertake an obligation. The amount that is paid by the buyer of the option to the writer is called premium.

The option premium consists of two components;

Intrinsic value, and Time value

Two important factors that determine the price are:

- The extent to which the option is in-the-money, and
- The chances that before expiry the option will become deeper in-the-money or will turn into in-the-money if it is presently out-of-the-money.

Example

- The value of the option can never fall below its intrinsic value.
- A call option with an exercise price of Rs. 80 on an underlying stock currently trading at Rs. 100 would have an intrinsic value of Rs. 20. This would be minimum price at which the call would sell.

#### Intrinsic value

The value attached to the option if it is exercised now is called its intrinsic value. The difference between spot price and exercise price will determine this value. The intrinsic value is

For call option:  $\text{Max} \{(S - X), 0\}$ , and

For put option:  $\text{Max} \{(X - S), 0\}$

Intrinsic value cannot be negative. The least intrinsic value is for out-of-the-money option, which is equal to zero.

#### Time Value

The time value is the excess of actual value over intrinsic value. Time value is associated with the chances that strike price will be pierced before expiry.

Time value of an option Actual Price – Intrinsic Value

Time value cannot be negative. At best/worst it can have zero value.



A 2-month call option on the Infosys with strike of Rs 2,100 is selling for Rs140 when the share is trading at Rs 2,200.

Find Intrinsic value of the call option, and

Why should one buy the call for a price in excess of its intrinsic worth?

#### Solution

The intrinsic worth of the option is  $(S - X) = 2,200 - 2,100 = \text{Rs } 100$  The price of the option is Rs 140 i.e. Rs 40 more than the intrinsic worth. This is the time value of the option and is paid because there are chances that in next two months the price of Infosys may rise further and beyond and holder stands to gain more than Rs 100.

### 11.4 Controlling Risk with Options

Options contracts can be used to minimize risk through hedging strategies that increase in value when the investments you are protecting from fall. Options can also be used to leverage directional plays with less potential loss than owning the outright stock position. This is because long options can only lose a maximum of the premium paid for the option, but have potentially unlimited profit potential.

For many investors, options are useful tools of risk management. They act as insurance policies against a drop in stock prices.

For example, if an investor is concerned that the price of their shares in LMN Corporation is about to drop, they can purchase puts that give the right to sell the stock at the strike price, no matter how low the market price drops before expiration. At the cost of the option's premium, the investor has insured themselves against losses below the strike price. This type of option practice is also known as hedging.

#### Option Hedging Strategies

The following are option hedging strategies commonly used by portfolio managers to reduce risk. Many options strategies are designed to minimize risk by hedging existing portfolios. While options act as safety nets, they're not risk free. Since transactions usually open and close in the short term, gains can be realized quickly. Losses can mount as quickly as gains.

#### Long-put position

A long put refers to buying a put option, typically in anticipation of a decline in the underlying asset. A long put could also be used to hedge a long position in the underlying asset. If the underlying asset falls, the put option increases in value helping to offset the loss in the underlying. Downside risk is limited using a long put options strategy.



#### Example of Protective Put

You own 100 shares in ABC Corp, with each share valued at \$100.

You believe that the price of your shares will increase in the future. However, you want to hedge against the risk of an unexpected price decline. Therefore, you decide to purchase one protective put contract (one put contract contains 100 shares) with a strike price of \$100. The premium of the protective put is \$5.

The following scenarios are possible:

Scenario 1: Share price above \$105: If the share price goes beyond \$105, you will experience an unrealized gain. The profit can be calculated as Current Share Price - \$105 (it includes initial share price plus put premium). The put will not be exercised.

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Scenario 2: Share price between \$100 and \$105: In this scenario, the share price will remain the same or slightly rise. The small loss is caused by the premium you paid for the put contract. Similar to the previous scenario, the put will not be exercised.

Scenario 3: Share price below \$100: In this case, you will exercise the protective put option to limit the losses. After the put is exercised, you will sell your 100 shares at \$100. Thus, your loss will be limited to the premium paid for the protective put.

### Covered call

A covered call strategy involves selling out of the money call options against a long equity position. This doesn't actually reduce downside risk, but the premium earned does offset potential losses to an extent. A covered call is constructed by holding a long position in a stock and then selling (writing) call options on that same asset, representing the same size as the underlying long position.



#### Example of Covered Call

The concept is that in owning the stock, you then sell an Out of the Money call option on a monthly basis as a means of collecting rent (or a dividend) while you own the stock. If the stock rises above the call strike, you'll be exercised, and the stock will be sold . . . but you make a profit anyway.

If the stock remains static, then you're better off because you collected the call premium. If the stock falls, you have the cushion of the call premium you collected.

### Collar

A collar entails buying a put option and selling a call option. By selling a call option, part of the cost of the put option is covered. The trade-off is that upside will be capped. A collar position is created by holding an underlying stock, buying an out of the money put option, and selling an out of the money call option. It limits the return of the portfolio to a specified range and can hedge a position against potential volatility of the underlying asset.



#### Example of Collar Option Strategy

Let us now look at an example: Say you are holding a long position on an asset that has just recently appreciated to a price of \$100. You are unsure about the price stability in the near-term future and want to utilize a collar strategy.

You buy a put option with a strike price of \$90 at a premium of \$5. You also sell a call option for \$5 with a strike price of \$110.

What is your payoff if the price of the asset falls to \$80?

The call option you've sold will not be exercised by the buyer and you will end with a payoff of \$5. The put option you've bought for \$5 will be exercised with a strike price of \$90 meaning a payoff of \$5.

The underlying asset will be worth \$80 meaning a loss of \$20.

The protective put option you've purchased reduced the losses experienced from a drop in the price of the underlying asset. In total your net loss will be:

$$\$5 + \$5 - \$20 = -\$10.$$

Rather than experiencing the full loss of  $\$80 - \$100 = -\$20$ , you have ended with a net loss of only \$10.

### Spread

In options trading, an option spread is created by the simultaneous purchase and sale of options of the same class on the same underlying security but with different strike prices and/or expiration dates. Any spread that is constructed using calls can be referred to as a call spread. Similarly, put spreads are spreads created using put options.

**Types of Spreads**

- Vertical spreads are constructed using options of the same class, same underlying security, same expiration month, but at different strike prices.
- Horizontal or calendar spreads are constructed using options of the same underlying security, same strike prices but with different expiration dates.
- Diagonal spreads are created using options of the same underlying security but different strike prices and expiration dates.

**Bull & Bear Spreads**

If an option spread is designed to profit from a rise in the price of the underlying security, it is a bull spread. Conversely, a bear spread is a spread where favorable outcome is attained when the price of the underlying security goes down

**Credit & Debit Spreads**

Option spreads can be entered on a net credit or a net debit. If the premiums of the options sold are higher than the premiums of the options purchased, then a net credit is received when entering the spread. If the opposite is true, then a debit is taken. Spreads that are entered on a debit are known as debit spreads

**Swap**

A swap is an agreement between counter-parties to exchange cash flows at specified future times according to pre-specified conditions.

A swap is equivalent to a coupon-bearing asset plus a coupon-bearing liability. The coupons might be fixed or floating.

**Currency Swap**

A currency swap is a foreign-exchange agreement between two institute to exchange aspects (namely the principal and/interest payments) of a loan in one currency for equivalent aspects of an equal in net present value loan in another currency.



As an example, suppose the British Petroleum Company plans to issue five-year bonds worth £100 million at 7.5% interest, but actually needs an equivalent amount in dollars, \$150 million to finance its new refining facility in the U.S. Also, suppose that the Piper Shoe Company, a U.S. company, plans to issue \$150 million in bonds at 10%, with a maturity of five years, but it really needs £100 million to set up its distribution center in London.

To meet each other's needs, suppose that both companies go to a swap bank that sets up the following agreements-

Also, suppose that the Piper Shoe Company, a U.S. company, plans to issue \$150 million in bonds at 10%, with a maturity of five years, but it really needs £100 million to set up its distribution center in London.

To meet each other's needs, suppose that both companies go to a swap bank that sets up the following agreements-

**Agreement 1**

- The British Petroleum Company will issue 5-year £100 million bonds paying 7.5% interest. It will then deliver the £100 million to the swap bank who will pass it on to the U.S. Piper Company to finance the construction of its British distribution center.
- The Piper Company will issue 5-year \$150 million bonds. The Piper Company will then pass the \$150 million to swap bank that will pass it on to the British Petroleum Company who will use the funds to finance the construction of its U.S. refinery.

## Agreement 2

- The British company, with its U.S. asset will pay the 10% interest on \$150 million to the swap bank that will pass it on to the American company so it can pay its U.S. bondholders.
- The American company, with its British asset will pay the 7.5% interest on £100 million to the swap bank that will pass it on to the British company so it can pay its British bondholders.

## Agreement 3:

At maturity, the British company will pay \$150million to the swap bank that will pass it on to the American company so it can pay its U.S. bondholders.

At maturity, the American company will pay £100million to the swap bank who will pass it on to the British company so it can pay its British bondholders.

## Uses of Currency Swaps

Currency swaps have two main uses:

To secure cheaper debt (by borrowing at the best available rate regardless of currency and then swapping for debt in desired currency using a back-to-back-loan).

To hedge against (reduce exposure to) exchange rate fluctuations

## 11.5 Foreign Exchange Risk

Foreign exchange risk is managed through two means-

Internal i.e. use of tools which are internal to the firm such as netting, matching, etc. and

External techniques i.e. use of contractual means such as forward contracts, future, option, etc. to insure against potential exchange losses. The usage of internal techniques is also known as passive hedging, while the latter is known as active hedging.

## External Techniques

External techniques which are also known as active hedging techniques, essentially involve contractual relationship with outside agency. Hedging is a method whereby one can reduce the financial exposure faced in an underlying asset due to volatility in prices by taking an opposite position in the derivatives market in order to offset the losses in the cash market by a corresponding gain in the derivatives market.

Constructing a hedge essentially involves -

- Identification of the exposure one is facing,
- Measurement of that exposure , and
- Construction of another position with the opposite exposure.

Construction of an exact opposite position to the existing risk exposure results in a perfect hedge.

### Hedging Through Forward Contract:

Forward contracts obligate one party to buy the underlying at a fixed price at a certain time in the future from a counter party who is obligated to sell the underlying at that fixed price. These are one of the oldest and commonest hedging tools of the forex market.

Consider an Indian exporter who expects to receive US \$1 million in six months. Suppose that the price of the dollar is Rs. 74.60 now. If the price of the dollar falls by 10%, the exporter loses Rs. 74 lakhs. But by selling dollars forward the exporter locks in the current forward rate of Rs. 74.65 which means even after dollar depreciating by 10% in the next 6 months, the exporter would still get Rs. 74.65 per dollar.



Example: An investor enters into a short forward contract to sell 100,000 British pounds for US dollars at an exchange rate of 1.4000 US dollars per pound.



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How much does the investor gain or lose if the exchange rate at the end of the contract is

- A. 1.3900and  
B. 1.4200?

The investor is obligated to sell pounds for 1.4000 when they are worth 1.3900.

The gain is  $(1.4000 - 1.3900) \times 100,000 = \$1,000$ .

The investor is obligated to sell pounds for 1.4000 when they are worth 1.4200.

The loss is  $(1.4200 - 1.4000) \times 100,000 = \$2,000$



Example: A conductor manufacturing company has entered into a forward contract to buy 2,000 Kg of aluminium after 6 months at Rs 100 per Kg.

What is the gain/loss for the manufacturing company if at the end of 6 months the price of aluminium turns out to be a) Rs 105 per Kg and b) Rs 98 per Kg?

The conductor manufacturing company has bought aluminium at Rs 100 per Kg. Profit or loss from the forward contract is

	Rs/kg	
Spot price at the end of six months =	105	98
less: Forward contract price =	100	100
Profit or loss from the forward contract =	5	-2

Profit/loss from forward contract = Quantity  $\times$  ( Spot price - Forward price)

When spot price is Rs 105; Profit =  $2,000 \times (105 - 100) = \text{Rs } 10,000$

When spot price is Rs 98; Loss =  $2,000 \times (98 - 100) = - \text{Rs } 4,000$

**Hedging Through Future Contract**

Futures contract is an agreement to buy and sell a standard quantity of specific financial instrument at a future date and at a price agreed between the parties through open outcry on the floor of an organized financial futures exchange. Under futures contract, there will always be a buyer and seller, whose obligation is not to each other but to a clearing house.

Hedging through futures contract is almost akin to hedging with forward contract. An exporter having a receivable can hedge by selling futures while a payable is hedged by buying a futures contract.

There is another difference between hedging through futures and forward contract, there are intermediate cash flows under futures contract owing to 'mark-to-market' mechanism.



Example: An investor owns one thousand shares of Reliance. Around budget time, he gets uncomfortable with the price movements. One contract on Reliance is equivalent to 100 shares. What he should do to hedge his position?

As he is having a long position in reliance he should take opposite position in future market to hedge his position.

As one contract is having 100 share to hedge he should sell 10 contract.

**Hedging Through Options**

Options provide hedging characteristics different from forward or futures contracts. Option contract allows the buyer to participate in the good side of the risk, while insuring against the bad side of the risk., An option has a right but no obligation to perform. Thus, an importer who purchased a call option will have a right to buy the underlying i.e. dollar at the agreed price, even if the current spot price is par above the price under option. There are two sides to every option contract-

On the one side is the option buyer who has taken a long position. On the other side is the option seller who has taken a short position.

The seller of the option receives a premium from the buyer of the option. It may be noted that while computing profit and loss, premium has to be taken into consideration.

Also, when a buyer makes profit, the seller makes a loss of equal magnitude and vice versa.

### A Long Position in a Call Option

In this strategy, the investor has the right to buy the asset in the future at a predetermined strike price i.e., strike price (K).

Long Call Option:  $\text{Max}(S_T - K, 0) - \text{Premium}$

If the settlement price (underlying stock closing price) of the asset is above the strike price, then the call option buyer will exercise his option and buy the stock at the strike price (K) otherwise not.



Example: Let us explain this with some examples. Mr. A buys a Call on an index (such as Nifty 50) with a strike price of Rs. 2000 for premium of Rs. 81.

Consider the values of the index at expiration as 1800, 1900, 2100, and 2200.

A Long Position in a Call Option

For  $S_T = 1800$ , Profit/Loss =  $0 - 81 = -81$  (maximum loss = premium paid)

For  $S_T = 1900$ , Profit/Loss =  $0 - 81 = -81$  (maximum loss = premium paid)

For  $S_T = 2100$ , Profit/Loss =  $2100 - 2000 - 81 = 19$

For  $S_T = 2200$ , Profit/Loss =  $2200 - 2000 - 81 = 119$

As we can see from the example, the maximum loss suffered by the buyer of the Call option is Rs. 81, which is the premium that he paid to buy the option. His maximum profits are unlimited and they depend on where the underlying price moves.

### A Long Position in a Put Option

In this strategy, the investor has bought the right to sell the underlying asset in the future at a predetermined strike price (K).

Long Put Option:  $\text{Max}(K - S_T, 0) - \text{Premium}$

If the settlement price (underlying stock closing price) at maturity is lower than the strike price, then the put option holder will exercise his option and sell the stock at the strike price (K) otherwise not.

For  $S_T = 1800$ , Profit/Loss =  $2000 - 1800 - 79 = 121$

For  $S_T = 1900$ , Profit/Loss =  $2000 - 1900 - 79 = 21$

For  $S_T = 2100$ , Profit/Loss =  $-79$  (maximum loss is the premium paid)

For  $S_T = 2200$ , Profit/Loss =  $-79$  (maximum loss is the premium paid)

As we can see from the example, the maximum loss suffered by the buyer of the Put option is Rs. 79, which is the premium that he paid to buy the option. His maximum profits are unlimited and depend on where the underlying price moves.

### Hedging Through Swaps

Swap is a contract to exchange cash flows over the life of the contract. Swap is simply a portfolio of forward contracts.

Swaps could involve currencies or interest rates. They help the corporate treasurer to manage his portfolio of liabilities. Swaps also help businesses to arbitrage on market imperfections and thereby raise finance at rates below market rates, otherwise available.

### Hedging Through Money Market

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Foreign exchange risk can arise either due to transaction exposure or translation exposure, which occurs because assets or liabilities are denominated in a foreign currency.

Translation exposure is a much bigger issue for large corporations than it is for small business and retail investors. The money market hedge is not the optimal way to hedge translation exposure – since it is more but it can be effectively used for hedging transaction exposure.

If a foreign currency receivable is expected after a defined period of time and currency risk is desired to be hedged via the money market, this would necessitate the following steps:

- Borrow the foreign currency in an amount equivalent to the present value of the receivable.
- Convert the foreign currency into domestic currency at the spot exchange rate.
- Place the domestic currency on deposit at the prevailing interest rate.
- When the foreign currency receivable comes in, repay the foreign currency loan (from step 1) plus interest.
- Similarly, if a foreign currency payment has to be made after a defined period of time, the following steps have to be taken to hedge currency risk via the money market:
- Borrow the domestic currency in an amount equivalent to the present value of the payment.
- Convert the domestic currency into the foreign currency at the spot rate.
- Place this foreign currency amount on deposit.
- When the foreign currency deposit matures, make the payment.

#### Conclusion

Whilst on hedging one should always remember that forward hedging of contractual exposures does not remove a firm's forex exposure. It merely, removes the uncertainty regarding the home currency value of that particular cash flow and nothing beyond. In other words such hedging only stabilizes the firm's cash flows or profits.

## **11.6 Problems regarding future, options, CAPM and bid ask price**

### Future

1. A two-month futures contract trades on the NSE. The cost of financing is 10% and the dividend yield on Nifty is 2% annualized. The spot value of the Nifty is 6000. What is the fair value of the future contract?

The price of a forward contract is given by the equation below:

$F_0 = S_0 e^{rT}$  in the case of continuously compounded risk free interest rate,  $r$

$F_0 = S_0 (1+r)^T$  in the case of annual risk free interest rate,  $r$

where,

$F_0$ : forward price

$S_0$ : Spot price

$t$ : time of the contract

The continuous compounding is done by multiplying the principal with  $e^{rt}$  where  $r$  is the rate of interest and  $t$  the time period.  $e$  is exponential function which is equal to 2.718.

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Fair value =  $6000 * e^{(0.1-0.02)} \times (60/365) = \text{Rs. } 6079.43$

2. XYZ Ltd.'s futures trade on NSE as one, two and three-month contracts. Money can be borrowed at 10% per annum. What will be the price of a unit of new two-month futures contract on XYZ Ltd. if no dividends are expected during the two-month period?

Assume that the spot price of XYZ Ltd. is Rs. 228.

$F_0 = S_0 (1+r)^T$  in the case of annual risk free interest rate, r

where,

F<sub>0</sub>: forward price

S<sub>0</sub>: Spot price

t: time of the contract

The continuous compounding is done by multiplying the principal with  $e^{rt}$  where r is the rate of interest and t the time period. e is exponential function which is equal to 2.718.

Thus, futures price  $F = 228 * e^{0.1 \times (60/365)} = \text{Rs. } 231.90$

3. Mr. Ram buys 100 calls on a stock with a strike of Rs.1,200. He pays a premium of Rs.50/call. A month later the stock trades in the market at Rs.1,300. Upon exercise what will he receive?

He brought a 100 call at 1200.

The current spot price is 1300.

There by getting 100 on 100 calls.

So he will receive 10000.

### Capital Asset Pricing Model:

1. An investor is contemplating a stock worth \$100 per share today that pays a 3% annual dividend. The stock has a beta compared to the market of 1.3, which means it is riskier than a market portfolio. Also, assume that the risk-free rate is 3% and this investor expects the market to rise in value by 8% per year.

What should investor should be expected return of the stock based on the CAPM?

$$RE = RF + BETA(RM - RF)$$

$$9.5\% = 3\% + 1.3 \times (8\% - 3\%)$$

So, investor should expect 9.5% based on risk free rate of return and beta.

2. Suppose a company uses only debt and internal equity to finance its capital budget and uses CAPM to compute its cost of equity. Company estimates that its WACC is 18%. The capital structure is 75% debt and 25% internal equity.

Before tax cost of debt is 12.5 % and tax rate is 20%. Risk free rate is  $r_{RF} = 6\%$  and market risk premium  $(r_m - r_{RF}) = 8\%$ : What is the beta of the company?

$$RE = RF + BETA(RM - RF)$$

$$\% re = 18\% = r_{RF} + \text{beta} (r_m - r_{RF})$$

$$18\% = 6\% + \text{beta} (8\%) = 1.5$$

3. You run a hedge fund specializing in identifying securities which are mispriced relative to the CAPM. Your research team has provided information about two potential investments, the

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Redback Spider Company and the Koalas are Marsupials not Bears Company, over the coming year. The expected market risk premium is 5% and the risk-free rate is 3%.

Companies	Annual Forecasted Return	Standard deviation
Redback Spider Company	12	30
Koalas	8	30

To know whether the security is under or overly priced, the required return would be calculated using CAPM:

The required return for Redback Spider:

$$K_e = \text{Risk free return} + \beta(\text{Market risk premium})$$

$$= 3\% + 2(5\%) = 13\%$$

Since the forecast is 12%, according to CAPM, the stock should deliver 13%. Thus, it is underpriced by 1%.

For Koalas:

$$K_e = \text{Risk free return} + \beta(\text{Market risk premium})$$

$$= 3\% + 0.8(5\%) = 7\%$$

The forecasted return is 8% however according to CAPM Model, the expected return is 7%. Therefore, this is a case of overvaluation.

**Bid-ask spread**

1. Consider the following bid-ask prices Rs-40-40.5/US\$. Find the bid-ask spread.

$$\text{Spread} = \frac{40.5 - 40}{40.5} \times 100 = 1.23\%$$

Find out the bid rate if the ask rate is 40.5/US\$ and the spread is 1.25%

$$0.0125 = \frac{40.5 - x}{40.5}$$

$$40.5 \times 0.0125 = 40.5 - x$$

$$X = 40.5 - 0.50625 = 39.99$$

Hence the Bid rate is Rs 39.99/US\$

**Options**

If an investor bought 1 XYZ Feb 60 call at 4 when the market was 62. Is the contract in the money, in the money or out of the money? Does the contract have intrinsic value? If so, what is it?

Options are financial derivatives whose value is derived from the value of the underlying assets, for example, a stock. Call options allow investors to buy the underlying assets at the strike price, while put options allow investors to sell the underlying assets at the strike price.

The option is in the money and has intrinsic value \$2. A call option is in the money if the strike price is lower current stock price.

2. Spot Price = Rs. 100. Call Option Strike Price = Rs. 98. Premium = Rs. 4. An investor buys the option contract. On Expiry of the option, the spot price is Rs. 108. What will be the net profit for the buyer?

$$\text{Call Option Strike Price} = \text{Rs. } 98$$

$$\text{Premium} = \text{Rs. } 4.$$

Option the Spot price is Rs. 108.

So difference between spot and strike price is Rs.10 to buyer.

He has paid a premium of Rs. 4.

So, net pay off to the buyers of option is Rs. 6.

3. A put option with a strike price of Rs. 1176 is selling at a premium of Rs. 36. What will be the price at which it will break even for the buyer of the option?

Put strike price of Rs. 1176

Premium is Rs.36

Put is purchased on the expectation that price will go down.

So breakeven for the investor is  $1176 - 36 = \text{Rs.}1140$ .

4. An exporter - ABC Co. is expected to receive an amount of USD 100000 after 3 months (in USD). Suppose the current 3-month futures rate is Rs 57. What course of action should ABC Co. take to hedge its position?

ABC Co. can go short in the futures contract to hedge itself.

Thereby any decrease in spot will be offset by profit in future.

5. An oil-importing firm - ABC Co. is expected to make future payments of USD 100000 after 3 months (in USD) for payment against oil imports. What course of action should ABC Co. should do to hedge its position?

ABC Co. can go long in the futures contract to hedge itself.

Thereby any increase in spot will be offset by future.

### **Futures**

1. A speculator buys 107 USD-INR contracts at Rs. 49.00 per contract and sells them at Rs.50.00 per contract. Assuming 1 contract = 1000 USD, what is the total profit made by the speculator in Rs?

- Brought 107 USD-INR contracts
- Brought at 49 and sold at 50, so the difference is Rs.1
- Then one contract value is 1000, which is 1000
- In 107 contracts, 107000 profit will be made by speculators in Rs.

2. A trader expects to see a fall in the price of USD-INR. He sells one two-month contract of futures on USD at Rs. 38.00 (each contract for USD 1000). Two months later, when the futures contract expires, USD-INR rate is Rs. 32.00. What profit trader will make?

- He sells one two-month contract of futures in USD for Rs. 38.00.
- The current spot rate is 32.
- So he will make Rs.6 profit.
- The contract is for 1000.

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So, in total, he will make a profit of Rs.6000.

3. Presume Entity A is expecting a remittance of USD 25000 on 27 August. Wants to lock in the foreign exchange rate today so that the value of inflow in Indian rupee terms is safeguarded. One contract is for USD 1000. What action should Entity A can take?

- The entity can do so by selling 25 contracts of USD-INR futures at NSE since one contract is for USD 1000.

**Summary**

Options are unique instruments that confer right to buy/sell an asset at predetermined price but create no obligation to do so. The call option gives right to buy but not an obligation and put option gives right to sell but not an obligation to sell. Option price included two variable that is intrinsic value and time value.

Option as instruments used to control risk. Various hedging strategies are used to reduce risk. Foreign exchange risk is managed through hedging techniques.

**Keywords**

Call option: It is right to buy the underlying asset at predetermined price within specified interval of time.

Put option: It is right to sell the underlying asset at predetermined price within specified interval of time.

Buyer or Holder: The person who obtains the right to buy or sell but has no obligation to perform is called the owner/ holder of the option. .

Writer or Seller: One who confers the right and undertakes the obligation to the holder is called seller/writer of an option.

Intrinsic value: The value attached to the option if it is exercised now is called its intrinsic value.

Time value: The time value is the excess of actual value over intrinsic value.

Swap: It is an agreement between counter-parties to exchange cash flows at specified future times according to pre-specified conditions.

**Self Assessment**

1. American options are options contracts that can be exercised ----- the expiration date.
  - A. At any time up to the expiration date
  - B. Only on the expiration date
  - C. Both of the above
  - D. None of the above
2. European options are options that can be exercised
  - A. At any time up to the expiration date
  - B. Only on the expiration date
  - C. Both of the above
  - D. None of the above
3. The option would lead to a negative cash flow to the holder if it were exercised immediately.

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- A. An in-the-money (ITM) option
  - B. An at-the-money (ATM) option
  - C. An out-of-the-money (OTM) option
  - D. Exotic option
4. The option would lead to equal cash flow to the holder if it were exercised immediately.
- A. An in-the-money (ITM) option
  - B. An at-the-money (ATM) option
  - C. An out-of-the-money (OTM) option
  - D. Exotic option
5. ----- is in the money when the spot price is more than the exercise price.
- A. Call option
  - B. Put option
  - C. Swap option
  - D. (Not Applicable).
6. ----- is in the money when the spot price is less than the strike price.
- A. Call option
  - B. Put option
  - C. Swap option
  - D. Not Applicable
7. If spot price is less than the strike price the holder lets the option expire as it is worthless.
- A. Call option
  - B. Put option
  - C. Swap option
  - D. Not Applicable
8. If spot price is more than the strike price the holder lets the option expire as it is worthless..
- A. Call option
  - B. Put option
  - C. Swap option
  - D. Not Applicable
9. The time value is the ----- of actual price over intrinsic value.
- A. Excess
  - B. Less
  - C. Equal
  - D. None of the above



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10. To the option holder, put options are worth \_\_\_\_\_ when the exercise price is higher; call options are worth \_\_\_\_\_ when the exercise price is higher
- A. More; more  
 B. More; less  
 C. Less; more  
 D. Less; less
11. - Buyers of put options anticipate the value of the underlying asset will \_\_\_\_\_ and sellers of call options anticipate the value of the underlying asset will \_\_\_\_\_
- A. Increase; increase  
 B. Decrease; increase  
 C. Increase; decrease  
 D. Decrease; decrease
12. A covered call strategy involves selling out of the money call options against a long equity position.
- A. True  
 B. False
13. Horizontal or calendar spreads are constructed using options of the same underlying security, same strike prices but with different expiration dates.
- A. True  
 B. False
14. A call is OTM when the underlying asset price is less than the strike price.
- A. True  
 B. False
15. The value attached to the option if it is exercised now is called its intrinsic value.
- A. True  
 B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. C  | 4. B  | 5. A  |
| 6. B  | 7. A  | 8. B  | 9. A  | 10. B |
| 11. D | 12. A | 13. A | 14. A | 15. A |

**Review Questions**

1. Distinguish between American Options and European Options.
2. Illustrate 'in-the-money' and 'out-of-the-money' positions in both call option and put option.

3. What is an Option Spread? Distinguish between vertical option spread and horizontal option spread.
4. Define the term 'Swap Contract'. Who are the parties involved in a swap?



### **Further Readings**

1. Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.



### **Web Links**

- <https://www.investopedia.com/terms/o/option.asp>
- <https://corporatefinanceinstitute.com/resources/knowledge/trading-investing/options-calls-and-puts/>
- <https://www.ig.com/en/trading-strategies/how-to-hedge-with-options-201102>
- <https://www.smartcurrencybusiness.com/services/hedging-strategies>

## Unit 12: Managing Foreign Operations

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### Objectives

- identify the sources of finance available to business.
- assess the implications of the different sources.
- Assess the Implications of the effective cash management in multinational.
- analyze implication payment mechanism in International trade.

### Introduction

Globalisation has opened doors by which activities of companies are not limited to one region or a single country. **International finance helps organizations engage in cross-border transactions with foreign business partners, such as customers, investors, suppliers and lenders.** Various international sources from where funds may be classified as long term sources and short term sources.

### 12.1 Long term Financing

Long term funding refers to financing that comprises a longer period of time that could go up to about 5 years or more. Long term financing is normally required for gaining new equipment, R&D, cash flow enhancement, and company expansion. Some of the long term financing are:

**Commercial Banks**

Global commercial banks all over provide loans in foreign currency to companies. They are crucial in financing non-trade international operations. The different types of loans and services provided by banks vary from country to country.

One example of this is Standard Chartered, which has emerged as a major source of foreign currency loans to the Indian industry. It is the most used source of international financing.

**International Agencies and Development Banks**

Many development banks and international agencies have come forth over the years for the purpose of international financing. These bodies are set up by the Governments of developed countries of the world at national, regional and international levels for funding various projects.

The more industrious among them include the International Finance Corporation (IFC), EXIM Bank and Asian Development Bank.

**International Equity Markets**

International equity markets are an important platform for global finance. They not only ensure the participation of a wide variety of participants but also offer global economies to prosper. Cross-listing, Yankee stocks, ADRs and GRS are important elements of equity markets.

The financial instruments used for this purpose are:

- (a) **Cross-listing:** Cross-listing refers to having the shares listed on one or more foreign exchanges. In particular, MNCs do this generally, but non-MNCs also cross-list. A firm may decide to cross-list its shares for the following reasons –
  - Cross-listing provides a way to expand the investor's base.
  - Cross-listing offers recognition of the company in a new capital market.
  - Cross-listing offers more investors.
  - Cross-listing may signal to investors of improved corporate governance
- (b) **Yankee Stock Offerings:** The direct sale of new equity capital to U.S. public investors by foreign firms. Privatization in South America and Eastern Europe. Equity sales by Mexican firms trying to cash in on NAFTA.
- (c) **The European Stock Market:** EASDAQ is a sort of a European NASDAQ that binds together national exchanges. UK, Germany, France, Switzerland, Austria, Italy, Belgium, Denmark, Portugal, Finland, Greece, Luxembourg, and the Netherlands. All trading is denominated in the euro.
- (d) **American Depository Receipts (ADR's):** This a tool often used for international financing. As the name suggests, depository receipts issued by a company in the USA are known as American Depository Receipts.

ADRs can be bought and sold in American markets like regular stocks. It is similar to a GDR except that it can be issued only to American citizens and can be listed and traded on a stock exchange of the United States of America.

- (e) **Global Depository Receipts (GDR's):** In the Indian context, a GDR is an instrument issued abroad by an Indian company to raise funds in some foreign currency and is listed and traded on a foreign stock exchange. A holder of GDR can at any time convert it into the number of shares it represents.

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## Unit 12: Managing Foreign Operations

The holders of GDRs do not carry any voting rights but only dividends and capital appreciation. Many renowned Indian companies such as Infosys, Reliance, Wipro, and ICICI have raised money through the issue of GDRs.

### International Bond Markets

International bonds are bonds issued by a country or company that is not domestic for the investor. The international bond market is quickly expanding as companies continue to look for the cheapest way to borrow money.

There are three general categories for international bonds are domestic, euro, and foreign. The categories are based on the country (domicile) of the issuer, the country of the investor, and the currencies used.

- Domestic bonds: Issued, underwritten and then traded with the currency and regulations of the borrower's country. For example, A British company issues debt in the United Kingdom with the principal and interest payments based or denominated in British pounds.
- Eurobonds: Underwritten by an international company using domestic currency and then traded outside of the country's domestic market. For example, : A British company issues debt in the United States with the principal and interest payments denominated in pounds.
- Foreign bonds: Issued in a domestic country by a foreign company, using the regulations and currency of the domestic country. For example, A British company issues debt in the United States with the principal and interest payments denominated in dollars.

Venture capital: Venture capital (VC) is a significant financial innovation of the twentieth century. Venture capital is the investment of long-term equity finance where the venture capitalist earns his return primarily in the form of capital gains.

The underlying assumption is that the entrepreneur and the venture capitalist would act together in the interest of the enterprise as 'partners'. Venture capitalist combines the qualities of bankers, stock market investors and entrepreneurs in one.

## 12.2 Short Term Financing

Short term financing with a period term of up to one year is utilized to enable companies to expand stock requests, payrolls, and day by day supplies. Some of the sources of short term finance are –

### Commercial Paper

Commercial paper is an unsecured, short-term loan issued by a corporation, typically for financing account receivable and inventories.

Unsecured promissory notes with a fixed maturity of one to 364 days; usually sold at a discount from face value. For the most part, commercial paper is a very safe investment because the financial situation of a company can easily be predicted over a few months. Furthermore, typically only companies with high credit ratings, and credit worthiness issued commercial paper.

### Merits of Commercial Paper

- It is an alternative source of raising short-term finance.
- It is a cheaper source of finance in comparison to the bank credit.

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- From an investor's point of view, it provides an opportunity to make a safe, short-term investment of surplus funds.

Trade Credit

Trade credit is the credit extended by one trader to another for the purchase of goods and services.

Trade credit facilitates the purchase of supplies without immediate payment. Trade credit is commonly used by business organizations as a source of short-term financing.

An informal arrangement, granted on an open account basis, not formally acknowledged as a debt.

Benefits

- Easy Availability.
- Flexibility.
- Informality.

Accrued Expenses and Deferred Income

Accrued expenses represent a liability that a firm has to pay for the services which it has already received. Deferred income represents funds received by the firm for goods and services which it has agreed to supply in the future.

Bank Borrowing

- Overdraft
- Purchase or Discounting of Bills
- Working Capital Loan

Promissory Note

A promissory note is a financial instrument that contains a written promise by one party (the note's issuer or maker) to pay another party (the note's payee) a definite sum of money, either on demand or at a specified future date.

A promissory note typically contains all the terms pertaining to the indebtedness, such as the principal amount, interest rate, maturity date, date and place of issuance, and issuer's signature.

Letter of Credit

A letter of credit, or "credit letter" is a letter from a bank guaranteeing that a buyer's payment to a seller will be received on time and for the correct amount.

Due to the nature of international dealings, including factors such as distance, differing laws in each country, and difficulty in knowing each party personally, the use of letters of credit has become a very important aspect of international trade.

### **12.3 External Commercial Borrowings**

India has always promoted capital inflows as a part of the development policy. Lack of domestic capital and deficit in the current account compelled the government historically to go after foreign capital.

In simple terms, foreign capital is money obtained from foreign countries to make investment domestically. As depicted by the data of Reserve Bank of India (RBI), the total external

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commercial borrowings i.e., loans granted by non-resident entities to eligible Indian borrowers in foreign currency, increased by a whopping 61.45 percent year-on-year to USD 50.15 billion, as of December 2019. This happens to be a 117 percent jump from the numbers of 2017.

External Commercial Borrowings refers to commercial loans availed from non-residents. ECB Includes: Bank Loan, Securitized instruments, Buyers credit, Loan from Foreign collaborator or Equity Holder. Minimum Average Maturity must be three years.

External commercial borrowing also known as Overseas Corporate borrowings is an additional source of funds to Indian Corporates as well as Public Sector Undertakings. This is specifically for expansion of existing capacity and also to expand the resources available domestically. In India, the ECB are permitted by the Govt. of India and further the access of Indian firms to foreign capital markets are monitored and regulated by the Ministry of Finance and the Reserve Bank.

#### Advantages of ECBs

- ECBs provide opportunity to borrow large volume of funds.
- The funds are available for relatively long term.
- Interest rates are also lower compared to domestic funds.
- ECBs are in the form of foreign currencies. Hence, they enable the corporate to have foreign currency to meet the import of machineries etc.

#### Two ways of raising ECB

- Automatic Route: When no approval from RBI is needed.
- Approval Route: When approval from RBI is needed.

#### **Automatic Route**

##### Eligible Borrowers

- Corporates (registered under the Companies Act except financial intermediaries) , housing finance companies & NBFCs.
- NGOs engaged in micro-finance activities. Such a NGO should have a satisfactory borrowing relationship for at least 3 years with a scheduled commercial bank authorized to deal in foreign exchange.
- Units in Special Economic Zones (SEZ) are allowed to raise ECB for their own requirement.
- Individuals, Trusts and Non-Profit making organizations are not eligible to raise ECB.

##### Recognized Lenders

- International banks.
- International capital markets.
- Multilateral financial institutions (IFC, ADB, CDC).
- Export credit agencies.
- Suppliers of equipment.
- Foreign collaborators.

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- Foreign equity holders.

## Condition for Foreign Equity Holders

- For ECB up to \$ 5 m - minimum equity of 25% held directly by the lender.
- For ECB more than \$ 5 m - minimum equity of 25% held directly by the lender & debt-equity ratio not exceed 4:1
- (The proposed ECB not exceeding four times the direct foreign equity holding).

## Restricted Areas

- Utilization of ECB is not permitted for on-lending or investment in capital market or acquiring a company (or a part thereof) in India by a corporate.
- Utilization of ECB is not permitted in real estate. Utilization of ECB is not permitted for working capital, general corporate purpose and repayment of existing Rupee loans.

## Prepayment

Prepayment of ECB up to \$ 500 m is allowed without prior approval of RBI. Pre-payment of ECB for amounts exceeding \$ 500 m would be considered by the Reserve Bank under the Approval Route. (Minimum average maturity period is applicable to the loan).

**Approval Route**

The approval route, on the other hand, mandates that companies which fall under certain pre-specified sectors must obtain the RBI's or the government's explicit permission, prior to raising funds through External Commercial Borrowing. The RBI has issued circulars and formal guidelines, specifying the borrowing structure.

In order to ensure that the inflow stays clean, the RBI has created the categorization of "eligible entities" amongst the borrowers, and that of "recognized non-residents" amongst potential lenders. Furthermore, it has maintained checks via forms of ECB, end-use restriction, minimum maturity period etc.

## Disadvantages of External Commercial Borrowing

- Funds available at lower rates. This could lead to companies borrowing with abandon and could lead to higher debt on the balance sheet of the company, thereby adversely affecting financial ratios.
- Rating agencies view companies with higher debt on their balance sheets with a negative perspective, subject to a fall in market value over a period of time.
- Since raising funds through External Commercial Borrowing is done in foreign currencies, the principal and the interest shall have to be paid in foreign currencies. As such, the company opens itself up to the risks associated with exchange rates. This could even lead the company to engage in cost-hedging.

## Refinancing

The fresh ECB is raised at a lower cost than the existing Maturity of the original ECB is maintained.

## Refinancing existing ECB

- Refinancing of existing ECB by raising fresh ECB is permitted provided:
  - No reduction in outstanding maturity of the original borrowing;



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- all-in-cost of fresh ECB to be lower than all-in-cost of existing ECB
- Refinancing of ECBs raised under the previous ECB framework – permitted
- Fresh ECB is not availed from overseas branches/ Subsidiaries of Indian banks except for highly rated corporates (AAA) and Maharatna/ Navratna public sector undertakings

Refinancing of INR ECB with FCY ECB is not permitted.

- Refinancing of ECBs raised under the previous ECB framework – permitted
- Fresh ECB is not availed from overseas branches/ Subsidiaries of Indian banks except for highly rated corporates (AAA) and Maharatna/ Navratna public sector undertakings

Refinancing of INR ECB with FCY ECB is not permitted.

Conversion of ECB into equity: Permitted subject to following:

- Activity of borrowing company covered under automatic route or required approval is obtained for FDI;
- Conversion not to breach applicable sectoral cap under FDI policy;
- Compliance with pricing guidelines (FV on date of conversion);

Permitted subject to following:

- Consent of other lenders; and
- Conversion at exchange rate on the date of agreement or any lesser rate with mutual Consent.

ECB interest also permitted to be converted into equity subject to applicable conditions.

Conclusion

What with the RBI delineating industry-specific distinctions for the automatic route and the approval route to ECB procurement, putting forth end-use restrictions and minimum average maturity periods, it is clear that ECBs are going to be harnessed as one of the primary vehicles to bring investment in India.

## **12.4 Multinational Cash Management**

The various issues associated with multinational cash management:

- The Management of Multinational Cash Balances
- Bilateral Netting of Internal and External Net Cash Flows
- Reduction in Precautionary Cash Flows
- Cash Management Systems in Practice

**The Management of International Cash Balances**

- The size of cash balances.
- The currency denomination.
- Where these cash balances are located.

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The size of cash balances: The optimal size of the firm's cash balances depend upon:

- The cost of keeping "too much" cash on hand.i.e., the opportunity costs of holding cash.
- The cost of not keeping enough cash on hand.i.e., the trading costs associated with having too little cash.
- The variability of cash flows.

Choice of Currency

By maintaining cash balances in a particular currency, the MNC is essentially speculating (or hedging?) in that currency.

Where these cash balances are located

- Should the firm have centralized cash management in the home country?
- Should the firm let each affiliate handle it locally?
- Where are borrowing costs lowest and investment returns highest?

#### **Netting: Bilateral and Multilateral**

Multilateral netting is an efficient and cost-effective mechanism for settling inter affiliate foreign exchange transactions. It decreases the number of transactions between the parties and also reduces the cost of accounting activities like bank fees. It adds security by ensuring that both account payables (AP) and Account Receivables (AR) are paid and thus minimizes the risk.

Not all countries allow MNCs to make net payments.

-By limiting netting, more unnecessary foreign exchange transactions flow through the local banking system.

- Exposure netting allows companies to manage their currency risk more holistically. If a company finds that the correlation between exposure currencies is positive, the company would adopt a long-short strategy for exposure netting.
- This is because, with a positive correlation between two currencies, a long-short approach would result in gains from one currency position offsetting losses from the other. Conversely, if the correlation is negative, a long-long strategy would result in an effective hedge in the event of currency movement.



Example: Assume Widget Co., located in Canada, has imported machinery from the United States and regularly exports to Europe. The company must pay \$10 million to its U.S. machinery supplier in three months, at which time it is also expecting a receipt of EUR 5 million and CHF 1 million for its exports. The spot rate is EUR 1 = USD 1.35, and CHF 1 = USD 1.10. How can Widget Co. use exposure netting to hedge itself?

The company's net currency exposure is USD \$2.15 million (i.e., USD \$10 million - [(5 x 1.35) + (1 x 1.10)]). If Widget Co. is confident that the Canadian dollar will appreciate over the next three months, it would do nothing, since a stronger Canadian dollar would result in U.S. dollars becoming cheaper in three months. On the other hand, if the company is concerned the Canadian dollar may depreciate against the U.S. dollar, it may elect to lock in its exchange rate in three months through a forward contract or a currency option.

Exposure netting is thus a more efficient way of managing currency exposure by viewing it as a portfolio, rather than hedging each currency exposure separately.

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Exposure netting can also be done to offset counterbalancing risks of a large portfolio or financial firm among its portfolios. As an enterprise risk management strategy, if portfolio A for a bank is long 1,000 shares of Apple stock and another portfolio B is short 1,000 of Apple, the positions and the exposure to Apple price can be netted out at the managerial level.

Exposure netting is usually referring to netting that happens within an organization among its various units, projects, or portfolios - making it a unilateral netting. In the case of netting with another party (e.g. in the case of a currency swap), that would be considered bilateral, or even multilateral netting.

### Reduction in Precautionary Cash Balances

- An additional benefit of a centralized cash depository is that the MNC's investment in precautionary cash balances can be substantially reduced without a decline in its ability to cover unforeseen expenses.
- In the above examples, suppose that each affiliate had to have the cash on hand to make disbursements before it received what it was owed – that would result in a big cash drain on the firm.

### Cash Management Systems in Practice

The most frequently cited benefits of a multilateral netting system are:

- The **decrease in the expense** associated with funds transfer, which in some cases can be over \$1,000 for a large international transfer of foreign exchange.
- The **reduction in the number of foreign exchange** transactions and the associated reduced cost of making fewer (but larger) transactions.

The most frequently cited benefits of a multilateral netting system are:

- The reduction in intercompany float, which is frequently as high as five days even for wire transfers.
- The savings in administrative time.

### Complications in Optimization of Cash Flow:

The process of optimization of cash flows in an MNC is complicated because of unique features of the company, government restrictions and characteristics of banking system.

- Optimisation of cash flow can be impeded because of the **specific situations existing among subsidiaries of MNC**. For example, if one of the subsidiaries delays payments to other subsidiaries, the latter may have no option but to borrow until the payments are received. This problem can be overcome by the centralized approach that monitors all inter-subsidiary payments.
- Cash flow optimisation policy is also disrupted by **government restrictions**. For example, some governments ban the use of a netting system. In addition, some governments prohibit the transfer of cash from the country, thereby preventing net payments from being made.
- Problem in efficient utilization of cash also arises due to **insufficient banking services in the country**. Banks in the USA, for example, are advanced in cash transfers, but other countries' banks do not offer such services to MNCs.

**Other crucial Issue for International finance manager**

Investing Excess Cash: Investing surplus cash in liquid assets such as Euro currency deposits, foreign treasury bills and commercial paper, etc. is one of the key functions of international finance manager.

While making decision in this regard many crucial issues merit thorough consideration.

The key considerations in this issue are:

Should the excess cash of all subsidiaries be pooled together or remain separated?

While handling the issue regarding deployment of surplus cash, an MNC has to decide if individual subsidiaries will make separate investments on their own or a centralized approach will be followed to pool the excess cash from each subsidiary, which will then be converted into a single currency for investment purposes.

Should the excess cash of all subsidiaries be pooled together or remain separated?

However, the advantage of pooling may be offset by the transaction costs involved in conversion into a single currency. Even then, centralized cash management could be useful.

**How can the effective yield expected from each possible alternative be determined?**

For an international finance manager, it is the effective yield, not the interest rate, which is important because the effective yield, say of a bank deposit, considers both the interest rate and the rate of appreciation (or depreciation) of the currency denominating the deposit.

**The effective yield on the foreign deposit can be determined by using the following formula:**

$$r = (1 + if)(1 + ef) - 1$$

- where r represents the effective yield on the foreign deposit;
- i f represents the quoted interest rate;
- e f is the percentage change in the value of the currency representing the foreign deposit from the date of deposit to the date of withdrawal.

**12.5 International Payment and Receivable**

Payments entail a significant portion of risk especially when executed cross-border and between relatively new trading partners. To succeed in today's global marketplace and win sales against foreign competitors, exporters must offer their customers attractive sales terms supported by appropriate payment methods. For exporters, any sale is a gift until payment is received. Therefore, the exporter wants to receive payment as soon as possible, preferably as soon as an order is placed or before the goods are sent. For importers, any payment is a donation until the goods are received. Therefore, importers want to receive the goods as soon as possible but to delay payment as long as possible, preferably until after the goods are resold to generate enough income to pay the exporter.

**Documentary Collections**

Documentary collection is a form of trade finance in which an exporter is paid for its goods by an importer after the two parties' banks exchange the required documents. The exporter's bank collects funds from the importer's bank in exchange for documents releasing title to the shipped merchandise, usually after the goods arrive at the importer's location.

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Generally recommended in situations where there is an established and ongoing trade relationship with a trusted buyer, this method can simplify your export transaction, offer faster payment, and reduce costs when compared to Letters of Credits. In a Documentary Collections transaction, the exporter's and the importer's banks facilitate the export sale by exchanging shipping documents for payment. However, the banks do not verify that the documents are accurate and do not guarantee payment as they do with Letters of Credit.

### Two Types of Documentary Collection

A documentary collection falls into two basic categories, depending on when the payment is made to the exporter:

- Documents against payment require the importer to pay the face amount of the draft at sight. This is the most common form of documentary collection because of the reduced risk for the seller.
- Documents against acceptance require the importer to pay on a specified date. Once the buyer accepts the time draft, the bank releases the documents to the buyer.

### Letter of Credit

A Letter of Credit (LC) is a document that guarantees the buyer's payment to the sellers. It is issued by a bank and ensures timely and full payment to the seller. If the buyer is unable to make such a payment, the bank covers the full or remaining amount on behalf of the buyer.

A letter of credit is issued against a pledge of securities or cash. Banks typically collect a fee, ie, a percentage of the size/amount of the letter of credit.



Example: Citibank offers letters of credit for buyers in Latin America, Africa, Eastern Europe, Asia, and the Middle East who may have difficulty obtaining international credit on their own. Citibank's letters of credit help exporters minimize the importer's country risk and the issuing bank's commercial credit risk. Letters of credit are typically provided within two business days, guaranteeing payment by the confirming Citibank branch. This benefit is especially valuable when a client is located in a potentially unstable economic environment. Since the nature of international trade includes factors such as distance, different laws in each country, and the lack of personal contact during international trade, letters of credit are a reliable payment mechanism.

### Parties to a Letter of Credit

Applicant (importer) requests the bank to issue the LC.

Issuing bank (importer's bank which issues the LC)

[Beneficiary (exporter).

### Advantages of Letter of Credit

- A letter of credit gives the trade partners an ability to transact with unknown partners or in newly established trade.
- A letter of credit is safer for the seller or exporter in case the buyer or importer goes bankrupt. Thus, a letter of credit insulates the exporter from the importer's business.
- A letter of credit can also be customized from one transaction to another with the same trading partners.

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- In the case of a dispute between the trading partners, a letter of credit accounting allows the exporter to withdraw the fund as agreed upon in the letter of credit and resolve the disputes later.

#### Disadvantages

- A letter of credit adds to the cost of doing as banks charge a fee for providing this service, and it can increase steeply if the parties want to put some additional features
- A letter of credit poses a material fraud risk to the bank will pay the exporter upon looking at the shipping documents and not the actual quality of goods. Disputes can arise if the quality is different from what was agreed upon.
- A letter of credit life cycle has an expiration date, and therefore the exporter has time limitation within which he will have to deliver the goods by all means. At times, this haste creates a mess.

#### **Buyer's Credit**

A buyer's credit is a short-term loan facility extended to an importer by an overseas lender such as a bank or financial institution to finance the purchase of capital goods, services, and other big-ticket items.

The importer, to whom the loan is issued, is the buyer of goods, while the exporter is the seller. Buyer's credit is a very useful financing method in international trade as it gives importers access to cheaper funds compared to what may be available locally.

#### Buyer's Credit Process

There are several steps involved in the buyer's credit process.

- The exporter first enters into a commercial contract with a foreign buyer or importer. The contract specifies the goods or services supplied along with prices, payment terms, etc.
- The buyer then obtains credit from a financial institution for the purchase. An export credit agency based in the exporter's country provides a guarantee to the lending bank to cover the risk of default by the buyer.

Once the exporter ships the goods, the lending bank pays the exporter according to the contract terms. The buyer makes principal and interest payments to the lending bank according to the loan agreement until the loan is repaid in full.

#### Advantages of Buyer's Credit

- Buyer's credit benefits both the seller and the buyer in a trade transaction. As mentioned above, borrowing rates are generally cheaper than what an importer may find with domestic lenders. The rates are typically based on London Interbank Offered Rate (LIBOR), the point of reference for most short-term interest rates.
- Another benefit extends to the exporter. Payment is made on time on the due date or according to the terms of the sales contract with the importer without any undue delays.

#### **Supplier Credit**

A Supplier credit is an agreement in a commercial contract under which an exporter will supply goods or services to a foreign buyer on credit terms. Since the exporter is also called a supplier, the agreement is called the supplier credit.

Supplier's Credit is a structure for financing imports into India. In this structure, overseas suppliers or financial institutions outside India provide financing to importers at Libor linked rates against a letter of credit (LC).

**Benefits of Suppliers Credit****For Importer**

- Availability of cheaper funds for import of raw materials and capital goods
- Ease short-term fund pressure as able to get credit
- Ability to negotiate better price with suppliers
- Able to meet the Suppliers requirement of payment at sight

**For Supplier**

- Realize at-sight payment
- Avoid the risk of importer's credit by making settlement with LC

**Difference**

- Buyers' credit finance means finance for payment of imports in India arranged by the importer (buyer) from a bank or financial institution outside India.
- The suppliers' credit means credits extended for imports directly by the overseas supplier instead of a bank or financial institution.

**12.6 Letter of Credit Mechanism**

A letter of credit or LC is a written document issued by the importer's bank on importer's behalf. Through its issuance, the exporter is assured that the issuing bank will make a payment to the exporter for the international trade conducted between both the parties.

**Why LC is important?**

The importer is the applicant of the LC, while the exporter is the beneficiary. A guiding principle of an LC is that the issuing bank will make the payment based solely on the documents presented. If the documents presented are in accord with the terms and conditions of the LC, the bank has no reason to deny the payment.

**Parties Involved in an LC-Main parties involved:**

- Applicant: An applicant (buyer) is a person who requests his bank to issue a letter of credit.
- Beneficiary: A beneficiary is basically the seller who receives his payment under the process.
- Issuing bank: The issuing bank (also called an opening bank) is responsible for issuing the letter of credit at the request of the buyer.
- Advising bank: The advising bank is responsible for the transfer of documents to the issuing bank on behalf of the exporter and is generally located in the country of the exporter.

**Letter of Credit - Process**

The entire process under LC consists of four primary steps:

**Step 1 - Issuance of LC**

After the parties to the trade agree on the contract and the use of LC, the importer applies to the issuing bank to issue an LC in favor of the exporter. The LC is sent by the issuing bank to the

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advising bank. The advising bank (confirming bank) verifies the authenticity of the LC and forwards it to the exporter.

#### Step 2 - Shipping of goods

After receipt of the LC, the exporter is expected to verify the same to their satisfaction and initiate the goods shipping process.

#### Step 3 - Providing Documents to the confirming bank

After the goods are shipped, the exporter (either on their own or through the freight forwarder) presents the documents to the advising/confirming bank.

#### Step 4 - Settlement of payment from importer and possession of goods

The bank, in turn, sends them to the issuing bank and the amount is paid, accepted, or negotiated, as the case may be. The issuing bank verifies the documents and obtains payment from the importer. It sends the documents to the importer, who uses them to get possession of the shipped goods.



Example: Suppose Mr. A (an Indian exporter) has a contract with Mr. B (an importer from the US) to send a shipment of goods. Both parties, being unknown to each other, decided to go for an LC arrangement.

The letter of credit assures Mr. A that he will receive the payment from the buyer and Mr. B that he will have a systematic and documented process along with evidence of goods having been shipped.

#### Factoring

A regular flow of working capital is needed for smooth functioning. The purchasers often delay their payment, resulting in blockage in working capital. So, expediting the collection of account receivables could alleviate the difficulties. The word factor is derived from the Latin word factor, which means to make or to do or get things done. In simple words, the factor is an agent who does things for his client for consideration called commission.

Therefore, factoring is a financial service designed to arrange payment of receivables in a better manner.

The main function of factoring is the realization of credit sales.

- Once the sale is completed, the transaction between buyer and seller is completed.
- Seller/Enter agreement with factor whereby factor will provide facility for debt collection.
- The invoice is sent to the factor. Generally, 80% of the invoice value is given as advance by the factor. The rest of 20% is paid against the realization.

The main function of factoring is the realization of credit sales.

- The Factor collects service charges and discount charges (comparable to the bank's interest rate) from the seller.
- Factor provides periodic statements.



Example: Assume a factor has agreed to purchase an invoice of \$1 million from Clothing Manufacturers Inc., representing outstanding receivables from Behemoth Co.





Example: The factor negotiates to discount the invoice by 4% and will advance \$720,000 to Clothing Manufacturers Inc. The balance of \$240,000 will be forwarded by the factor to Clothing Manufacturers Inc. upon receipt of the \$1 million accounts receivable invoice for Behemoth Co. The factor's fees and commissions from this factoring deal amount to \$40,000. The factor is more concerned with the creditworthiness of the invoiced party, Behemoth Co., than the company from which it has purchased the receivables.

#### Functions

- Assumption of Credit risk.
- Maintenance of Sales Ledger.
- Collection of Account Receivable.
- Finance of Trade debts.
- Providing Advisory Services.
- Credit Analysis of Customer.

#### Benefits

- Immediate cash flow.
- Invoice Processing.
- Less Cost.
- Source of Finance.
- Credit Screening.

#### Forfaiting

Forfaiting is a mechanism in which an exporter surrenders his rights to receive payment for the goods delivered or services rendered to the importer in exchange for an instant cash payment from a forfaiter. In this way, an exporter can easily turn a credit sale into a cash sale, without recourse to him or his forfaiter.

A forfaiter is a financial intermediary that provides assistance in international trade. It is evidenced by negotiable instruments, i.e. bills of exchange and promissory notes.

It is a financial transaction that helps to finance contracts in the medium to long term for the sale of receivables on capital goods. However, at present, forfaiting involves receivables of short maturities and large amounts.

#### Key Differences between Factoring and Forfaiting

The major differences between factoring and forfaiting are described below.

- Factoring refers to a financial arrangement whereby the business sells its trade receivables to the factor (bank) and receives a cash payment. Forfaiting is a form of export financing in which the exporter sells the claim of trade receivables to the forfeiter and gets immediate cash payment.
- The major differences between factoring and forfaiting are described below.
- Factoring deals with receivables that fall due within 90 days. On the other hand, Forfaiting deals in accounts receivable whose maturity ranges from medium to long term.

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- Factoring involves the sale of receivables on ordinary goods. Conversely, the sale of receivables on capital goods is made in forfaiting.
- Factoring provides 80-90% finance while forfaiting provides 100% financing of the value of export.
- Factoring can be recourse or non-recourse. On the other hand, forfaiting is always non-recourse.
- Factoring costs are incurred by the seller or client. Forfaiting costs are incurred by the overseas buyer.
- Forfaiting involves dealing with negotiable instruments like bills of exchange and promissory notes, which is not in the case of Factoring.
- In factoring, there is no secondary market, whereas in forfaiting, a secondary market exists, which increases the liquidity in forfaiting.

### Summary

International finance helps the organization to raise funds from different alternatives. There are long term and short term source of finance. International equity market and International bond market provides various alternatives. External Commercial Borrowings refers to commercial loans availed from non-residents. A

Multilateral netting is an efficient and cost-effective mechanism for settling inters affiliate foreign exchange transactions. International payment and receivable mechanism involves documentary credit and letter of credit. Factoring and forfeiting are the important aspects of collection of receivables.

### Keywords

**American Depository Receipts (ADR's):** It is the receipt that is issued to USA investors by companies outside United States.

**Global Depository Receipts (ADR's):** It is the receipt that is issued by companies abroad to raise funds in some foreign currency and is listed and traded on a foreign stock exchange.

**Foreign bonds:** Issued in a domestic country by a foreign company, using the regulations and currency of the domestic country.

**Commercial paper:** Commercial paper is an unsecured, short-term loan issued by a corporation, typically for financing account receivable and inventories. .

**Letter of Credit (LC):** A Letter of Credit (LC) is a document that guarantees the buyer's payment to the sellers.

### Self Assessment

1. A firm's return on equity can be measured by the risk-free interest rate ----- a premium that reflects the risk of the firm.
  - A. Plus
  - B. Minus
  - C. Multiply
  - D. Divide

---

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2. The main advantage of equity financing is that there is -----obligation to repay the money acquired through it
- A. No
  - B. Much
  - C. Only some
  - D. Not Applicable
3. If the return on assets acquired from the debt funds is greater than the cost of debt, the earnings per share will -----.
- A. Increase
  - B. Decrease
  - C. Both (a) and (b)
  - D. Neither (a) nor (b)
4. Multilateral Netting ----- the number of transactions between the parties and also reduces the cost of accounting activities like bank fees.
- A. Decreases
  - B. Increases
  - C. No Change
  - D. All of the above
5. With a positive correlation between two currencies, a ----- approach would result in gains from one currency position offsetting losses from the other.
- A. Long-short
  - B. Long-long
  - C. Both (a) and (b)
  - D. All of the above
6. With the correlation is negative, a ----- strategy would result in an effective hedge in the event of currency movement.
- A. Long-short
  - B. Long-long
  - C. Both (a) and (b)
  - D. All of the above
7. Factoring is a financial service designed for
- A. Receivable Management
  - B. Creditor Management
  - C. Equal
  - D. None of the above
8. An informal arrangement, granted on an open account basis, not formally acknowledge as a debt
- A. Trade credit
  - B. Accrued Expense

- C. Both of the above
  - D. None of the above
9. A letter of credit or LC is a written document issued by the importer's bank on importer's behalf.
- A. True
  - B. False
  - C. All facts are not given
  - D. Not Applicable
10. Factoring refers to a financial arrangement whereby the business ----- its trade receivables to the factor (bank) and receives a cash payment.
- A. Sells
  - B. Purchase
  - C. All facts are not given
  - D. Not Applicable
- 11 A Letter of Credit (LC) is a document that guarantees the buyer's payment to the -----.
- A. Seller
  - B. Buyer
  - C. Nor buyer or seller
  - D. Not Applicable
12. The Factor collects service charges and discount charges (comparable to the bank's interest rate) from the seller.
- A. True
  - B. False
13. External Commercial Borrowings refers to commercial loans availed from nonresidents.
- A. True
  - B. False
14. In a Documentary Collections transaction, the exporters and the importer's banks facilitate the export sale by exchanging shipping documents for payment.
- A. True
  - B. False
15. Forfaiting is a mechanism in which an exporter surrenders his rights to receive payment for the goods delivered or services rendered to the importer in exchange for an instant cash payment from a forfaiter.
- A. True
  - B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. A  | 3. A  | 4. B  | 5. A  |
| 6. B  | 7. A  | 8. A  | 9. A  | 10. A |
| 11. A | 12. A | 13. A | 14. A | 15. A |

**Review Questions**

1. Discuss in brief long term source of International Finance.
2. Discuss in brief short term source of International Finance.
3. Distinguish between American Depository Receipts and Global Depository Receipts.
4. Explain in brief about meaning and process of factoring and forfeiting.
5. Discuss in brief about mechanism of letter of credit.

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**Unit 13: Foreign Direct Investment and Cross Border Acquisitions****CONTENTS**

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**Objectives**

- analyze the benefits of investing overseas
- assess the concept of cross border merger and acquisition.
- assess how to identify political risk and hedge it.
- analyze implication of merger and acquisition.

**Introduction**

FDI can be in the form of Greenfield investments - the establishment of a wholly new operation in a foreign country or acquisitions or mergers with existing firms in the foreign country. Cross border Mergers and Acquisition have become fundamental characteristics of the global business landscape. Increased deregulation, privatization, and corporate restructuring has spurred an unprecedented surge in cross border merger and acquisition activity. Cross-border acquisition is when one company acquires a company that is based on a different country. Cross-border M&A can help companies to expand their operations around the world without having to start from the ground up, although there are certainly challenges facing both the acquirer and the acquired company.

**13.1 Why Do Firms Invest Overseas or locate production overseas?**

The main reasons for a firm to invest overseas are-

**Trade Barriers**

Government action leads to market imperfections. Tariffs, quotas, and other restrictions on the free flow of goods, services and people. Trade Barriers can also arise naturally due to high transportation costs, particularly for low value-to-weight goods.

**Labor Market Imperfections**

Among all factor markets, the labor market is the least perfect. Recall that the factors of production are land, labor, capital, and entrepreneurial ability. If there exist restrictions on the flow of workers across borders, then labor services can be underpriced relative to productivity. The restrictions may be immigration barriers or simply social preferences. Persistent wage differentials across countries exist. This is one of the main reasons MNCs are making substantial FDIs in less developed nations.

**Intangible Assets**

Coca-Cola has a very valuable asset in its closely guarded "secret formula". To protect that proprietary information, Coca-Cola has chosen FDI over licensing. Since intangible assets are difficult to package and sell to foreigners, MNCs often enjoy a comparative advantage with FDI.

**Vertical Integration**

MNCs may undertake FDI in countries where inputs are available in order to secure the supply of inputs at a stable accounting price.

Vertical integration may be backward or forward:

- Backward: a furniture maker buying a logging company.
- Forward: U.S. car makers began to build their own network of dealerships in Japan.

**Product Life Cycle**

U.S. firms develop new products in the developed world for the domestic market, and then markets expand overseas. FDI takes place when product maturity hits and cost becomes an increasingly important consideration for the MNC. Increasingly product innovations are taking place outside the United States as well, and new products are being introduced simultaneously in many advanced countries.

**Shareholder Diversification**

Firms may be able to provide indirect diversification to their shareholders if there exists significant barriers to the cross-border flow of capital. Capital Market imperfections are of decreasing importance, however. Managers can therefore probably not add value by diversifying for their shareholders as the shareholders can do so themselves at lower cost.

**13.2 Political Risk and FDI**

Refers to the potential losses to the parent firm resulting from adverse political developments in the host country. Unquestionably this is the biggest risk when investing abroad. The different types of political risks are-

**Macro Risk:** All foreign operations put at risk due to adverse political developments.

**Micro Risk:** Selected foreign operations put at risk due to adverse political developments.

**Transfer Risk:** Uncertainty regarding cross-border flows of capital.

**Operational Risk:** Uncertainty regarding host countries policies on firm's operations.

**Control Risk:** Uncertainty regarding expropriation.

**13.3 Measuring Political Risk**

**The host country's political and government system:** A country with too many political parties and frequent changes of government is risky.

**Track records of political parties their relative strength:** If the socialist party is likely to win the next election, watch out.

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**Integration into the world system:**North Korea, Iraq, Libya are examples of isolationist countries unlikely to observe the rules of the game.

**Ethnic and religious stability:**Look at the recent civil war in Bosnia.

**Regional security:**Kuwait is a nice enough country, but it's in a rough neighborhood.

**Key economic indicators**

Political risk is not entirely independent of economic risk. Severe income inequality and deteriorating living standards can cause major political disruptions. In 2002, Argentina's protracted economic recession led to the freezing of bank deposits, street riots, and three changes of the country's presidency in as many months.

## 13.4 Hedging Political Risk

**Geographic diversification**

Simply put, don't put all of your eggs in one basket. The first step in managing political risk is understanding that these risks are often worth taking in order to maintain a diversified portfolio. Even if you keep all of your investments in the U.S., you are still exposed to decisions made in Washington D.C. Diversification should include hedging the risk that is inherent to international investments.

**Buying Political Risk Insurance**

Multinational companies could go to one of the many organizations that specialize in selling political risk insurance and purchase a policy that would compensate them if an adverse event occurred. Because premium rates depend on the country, the industry, the number of risks insured, and other factors, the cost of doing business in one country may vary considerably compared to another.

**Buying Political Risk Insurance**

However, buying political risk insurance does not guarantee that a company will receive compensation immediately after an adverse event.

**Minimize exposure**

Form joint ventures with local companies. Local government may be less inclined to expropriate assets from their own citizens.

Join a consortium of international companies to undertake FDI. Local government may be less inclined to expropriate assets from a variety of countries all at once.

Finance projects with local borrowing.

**Watch for the Indicators**

Some indicators to watch out for in the countries you may invest in are the rise of different or new political parties, upcoming elections, or any new trade agreements affecting a country. It may also be helpful to set up alerts or other automated reminders to keep track of potential political risks in key markets.

**Watch for the Indicators**

This way, you can be alerted early on when problems arise, and then take the necessary actions to reduce exposure to riskier areas. The key is to not overreact to the news but to determine what's truly happening and if it impacts your investments.



### **13.5 Cross border Mergers and Acquisition**

Cross border Mergers and Acquisition have become fundamental characteristics of the global business landscape. Increased deregulation, privatization, and corporate restructuring has spurred an unprecedented surge in cross border merger and acquisition activity.

Cross-border acquisition is when one company acquires a company that is based on a different country. Cross-border M&A can help companies to expand their operations around the world without having to start from the ground up, although there are certainly challenges facing both the acquirer and the acquired company.

#### **Concept of Cross-border Mergers and Acquisitions**

Assets and liabilities of the two companies from two different countries are combined into a new legal entity in terms of the merger, while in terms of acquisition, there is a transformation process of assets and liabilities of local company to foreign company (foreign investor), and automatically, the local company will be affiliated.

Since the cross border M&As involving two countries, according to the applicable legal terminology, the state where the origin of the companies that make an acquisition (the acquiring company) in other countries refer to as the Home Country, while countries where the target company is situated refers to as the Host Country.

#### **Factors for Cross Border Mergers and Acquisitions**

Cross border M&A's actualize only when there are incentives to do so. In other words, both the foreign company and the domestic partner must gain from the deal as otherwise; eventually the deal would turn sour.

Given the fact, that many domestic firms in many emerging markets overstate their capabilities in order to attract M&A, the foreign firms have to do their due diligence and take the help of management consultancies and investment banks before they venture into an M&A deal.

Apart from this, the foreign firms also consider the risk factors associated with cross border M&A that is a combination of political risk, economic risk, social risk, and general risk associated with black swan events. Moreover Cross border M&A also needs regulatory approvals as well as political support because in the absence of such facilitating factors, the deals cannot go through.

#### **Effects of Cross Border Merger and Acquisitions**

Cross border M&A's enables the global transfer of technology, capital, goods and services and integrates for universal networking. It leads to economies of scale and scope which helps in gaining efficiency. Apart from this it also benefits the economy such as increased productivity of the host country, increase in economic growth and development particularly if the policies used by the government are favorable. Let's look at those effects in detail.

**Capital Build Up:** Cross border M&A's in order to expand their businesses it not only undertakes investment in plants, buildings and equipment's but also in the intangible assets such as the technical know-how, skills rather than just the physical part of the capital.

**Employment Creation:** M&A's would lead to employment gains in the long term. When in the long run the businesses expand and becomes a successful it would create new employment opportunities.

**Technology handover:** When companies across countries come together it sustains positive effects of transfer of technology, sharing of best management skills and practices and investment in intangible assets of the host country. This in turn leads to innovations and has an influence on the operations of the company.

#### **Functional Classification of Merger and Acquisitions**

##### **i) Horizontal M&As (between competing firms in the same industry):**

They have grown rapidly recently because of the global restructuring of many industries in response to technological change and liberalization. By consolidating their resources, the merging firms aim to achieve synergies (the value of their combined assets exceeds the sum of their assets taken separately) and often greater market power.

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Example: Facebook and Instagram: One of the most definitive examples of horizontal integration was Facebook's acquisition of Instagram in 2012 for a reported \$1 billion. Both Facebook and Instagram operated in the same industry (social media) and shared similar production stages in their photo-sharing services.

**ii) Vertical M&As (between firms in client supplier or buyer-seller relationships):**

Typically they seek to reduce uncertainty and transaction costs as regards forward and backward linkages in the production chain, and to benefit from economies of scope. M&As between parts and components makers and their clients (such as final electronics or automobile manufacturers) are good examples.



Example: A textile company merging with a cotton yarn manufacturer is an example of a vertical merger. It helps the textile company have control over its raw material cotton yarn.

Steel is one of the important components in a car. An automobile company merging with a steel manufacturer helps it manufacture its raw material in-house. Similarly, an automobile company can also merge with a tire company or an automobile battery manufacturer.

**iii) Conglomerate M&As (between companies in unrelated activities):**

They seek to diversify risk and deepen economies of scope. A conglomerate merger is a merger between firms that are involved in totally unrelated business activities. These mergers typically occur between firms within different industries or firms located in different geographical locations.



Example: Company A specializing in manufacturing radios, merges with Company B, which specializes in manufacturing watches, to form Company C. Company C now has access to a large customer base to which it can market its products to (e.g., Company A's product to Company B's customers, and vice versa).

**Cross Border Merger and Acquisitions - Issues and Challenges**

- Political Concerns.
- Cultural Challenges.
- Legal Considerations.
- Tax And Accounting Considerations.
- Due Diligence.

**Foreign Direct Investment Motive**

FDI is a long-term active participation from foreign country to other countries usually in the form of management participation, joint ventures, or transfer technology and know-how.

Basically, the flow of FDI into a country can be done in two ways, through green-field investment, or by making mergers and acquisitions of local companies.

**Financial Motive**

The main motivation of doing Cross Border M&As is related to financial performance. In most cases, Financial motive is more visible than other motives. It is related to the purpose of doing mergers and acquisitions, in which the decision is based on interests of the shareholders and the board of directors. There are several activities underlying this motive:

- Economy of scale

- Increased Revenue or Market share
- Resource Transfer
- Geographical or other diversification.

**Strategic Motive**

Strategic motive is a more complex motive behind Cross Border M&As. They can be:

**Cross-sell:** For example, a bank buying a stock broker could then sell its banking products to the stock broker's customers, while the broker can sign up for the bank's customers for brokerage accounts. Or, a manufacturer can acquire and sell complementary products. Strategic motive is a more complex motive behind Cross Border M&As. They can be:

**Synergy:** For example, managerial economies such as the increased opportunity of managerial specialization. Another example is purchasing economies due to increased order size and associated bulk-buying discounts.

**International Growth In Relation With Cross Border Mergers and Acquisitions**

The most fundamental motives to conduct cross border M&As is growth. Companies who seeking for expand have two options and should choose between internal growth and M&As growth. Company choose M&As for faster growth and to enhance resources, such as facilities, well established managements, and other resources available for additional competition purpose in the market.

On a whole cross border merger and acquisitions can provide great benefits to companies and also increase its share price but as we saw there are a lot of factors which need to be taken into consideration to avoid any glitches. Most critical factors which separate the successful M&A transactions from the others, who fail, are thorough and planned preparation and commitment of time and other resources.

**Summary**

FDI and cross broader acquisition plays an important role in development of the nation. Cross-border M&A can help companies to expand their operations around the world without having to start from the ground up, although there are certainly challenges facing both the acquirer and the acquired company.

Firm invest overseas for the reasons like trade barriers, labor market imperfections, intangible assets,

Political risk refers to the potential losses to the parent firm resulting from adverse political developments in the host country. The major risk are macro risk and micro risk. When all operations are at risk is major risk and when selected foreign operations put at risk due to adverse political developments it is micro risk. Measuring and hedging political risk is important dimension. On a whole cross border merger and acquisitions can provide great benefits to companies and also increase its share price but as we saw there are a lot of factors which need to be taken into consideration to avoid any glitches.

**Keywords**

**Macro risk:** It is situation in which all foreign operations put at risk due to adverse political developments.

**Micro risk:** It is situation in which selected foreign operations put at risk due to adverse political developments.

**Transfer Risk:** It is risk which involves uncertainty regarding cross-border flows of capital.

**Operational Risk:** It is risk which involves uncertainty regarding host countries policies on firm's operations.

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Control Risk : It is risk which involves uncertainty regarding expropriation.

Conglomerate merger A conglomerate merger is a merger between firms that are involved in totally unrelated business activities

### **Self Assessment**

1. The examples of ----- where Facebook's acquisition of Instagram .Both Facebook and Instagram operated in the same industry (social media) and shared similar production stages in their photo-sharing services. .
  - A. Vertical integration
  - B. Forward integration
  - C. Seal Integration
  - D. Not Applicable
  
2. A furniture maker buying a logging company is an example of----- .
  - A. Vertical integration
  - B. Forward integration
  - C. Seal Integration
  - D. Not Applicable
  
3. U.S. car makers began to build their own network of dealerships in Japan is an example of-----
  - A. Vertical integration
  - B. Forward integration
  - C. Seal Integration
  - D. Not Applicable
  
4. Basically, the flow of FDI into a country can be done in two ways, through green-field investment, or by making mergers and acquisitions of local companies.
  - A. True
  - B. False
  - C. Depends on market
  - D. None of the above
  
5. In----- all foreign operations put at risk due to adverse political developments..
  - A. Macro risk
  - B. Micro risk
  - C. Both of the above
  - D. None of the above
  
6. In----- Selected foreign operations put at risk due to adverse political developments.
  - A. Macro risk
  - B. Micro risk

- C. Both of the above  
D. None of the above
7. -----risk involves uncertainty regarding cross-border flows of capital..
- A. Transfer risk  
B. Operational Risk  
C. Control Risk  
D. Not Applicable
8. -----risk involves uncertainty regarding host countries policies on firm's operations.
- A. Transfer risk  
B. Operational Risk  
C. Control Risk  
D. Not Applicable
9. -----risk involves Uncertainty regarding expropriation.
- a. Transfer risk  
b. Operational Risk  
c. Control Risk  
d. Not Applicable
10. A country with too many political parties and frequent changes of government is -----risky.
- a. More  
b. Less  
c. Neither more or less  
d. Not Applicable
11. Local government may be ----- inclined to expropriate assets from their own citizens..
- A. More  
B. Less  
C. Does not effect  
D. Not Applicable
12. Trade Barriers can also arise naturally due to high transportation costs, particularly for low value-to-weight goods.
- A. True  
B. False
13. Persistent wage differentials across countries exist. This is one on the main reasons MNCs are making substantial FDIs in less developed nations.
- A. True

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**Unit 13: Foreign Direct Investment and Cross Border Acquisitions**

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B. False

14. Political risk is not entirely independent of economic risk.

A. True

B. False

15. The first step in managing political risk is understanding that these risks are often worth taking in order to maintain a diversified portfolio.

A. True

B. False

### **Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. B  | 4. A  | 5. A  |
| 6. B  | 7. A  | 8. B  | 9. A  | 10. A |
| 11. B | 12. A | 13. A | 14. A | 15. A |

### **Review Questions**

- 1) Enumerate various trends in Global FDI.
- 2) Differentiate between horizontal, vertical and conglomerate merger.  
Describe the various motives for cross broader mergers and acquisition?
- 3) What do you mean by Political risk?
- 4) Explain how to measure and hedge political risk.



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## Unit 14: Country Risk Analysis

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### Objectives

- meaning and understand country risk
- assess country risk analysis and factors
- understand nature of country risk assessment.
- assess ways of measuring country risk assessment and raters.

### Introduction

When business transactions occur across international borders, they bring additional risks compared to those in domestic transactions. These additional risks are called country risks which include risks arising from national differences in sociopolitical institutions, economic structures, policies, currencies, and geography.

### 14.1 Meaning of Country risk

Country risk represents the potentially adverse impact of a country's environment on the MNC's cash flows. Examples of situations where Country Risk could play an important role: Portfolio investment done in another country may suffer loss if the Share prices tumble because a certain party came to power in general elections.

Country Risk Analysis is the evaluation of possible risks and rewards from business experiences in a country. Country risk analysis identifies imbalances that increase the risks in a cross-border investment.



#### Example-Country risk Analysis

A multinational enterprise (MNE) that sets up a plant in a foreign country faces different risks compared to bank lending to a foreign government.

The MNE must consider the risks from a broader spectrum of country characteristics. Some categories relevant to a plant investment contain a much higher degree of risk because the MNE remains exposed to risk for a longer period of time.

Significance-Country risk Analysis:

*International Financial management*

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- Look at companies investing in Ukraine and Russia in 2014 or the companies investing in Greece in 2011 or Argentina in 2001.
- Value of Russian, Ukrainian, Greek and Argentine assets went down significantly.
- Global investors, MNCs, bondholders realize the relevance of country risk analysis.

Use of-Country Risk Analysis:

- to monitor countries where the MNC is presently doing business;
- as a screening device to avoid conducting business in countries with excessive risk; and
- to improve the analysis used in making long-term investment or financing decisions.

**Political Risk Factors**

- Attitude of Consumers in the Host Country

Some consumers may be very loyal to homemade products.

- Attitude of Host Government

The host government may impose special requirements or taxes, restrict fund transfers, subsidize local firms, or fail to enforce copyright laws.

- Blockage of Fund Transfers

Funds that are blocked may not be optimally used.

- War

Internal and external battles, or even the threat of war, can have devastating effects.

- Bureaucracy

Bureaucracy can complicate businesses.

- Corruption

Corruption can increase the cost of conducting business or reduce revenue.

**Financial Risk Factors**

Current and Potential State of the Country's Economy

- A recession can severely reduce demand.
- Financial distress can also cause the government to restrict MNC operations.

**Indicators of Economic Growth**

- A country's economic growth is dependent on several financial factors - interest rates, exchange rates, inflation,

**Economic Risk**

- Economic Risk is the significant change in the economic structure or growth rate that produces a major change in the expected return of an investment.
- Risk arises from the negative changes in fundamental economic policy goals (fiscal, monetary, international, or wealth distribution or creation).

**Transfer Risk**



- Transfer Risk is the risk arising from a decision by a foreign government to restrict capital movements. Restrictions could make it difficult to repatriate profits, dividends, or capital.
- It usually is analyzed as a function of a country's ability to earn foreign currency, with the implication that difficulty earning foreign currency increases the probability that some form of capital controls can emerge.

#### **Exchange Risk**

- Exchange Risk is an unexpected adverse movement in the exchange rate. Exchange risk can be defined as a form of risk that arises from the change in price of one currency against another. Whenever investors or companies have assets or business operations across national borders, they face currency risk if their positions are not hedged.

### **14.2 Types of Country Risk Assessment**

A macro-assessment of country risk is an overall risk assessment of a country without consideration of the MNC's business.

A micro-assessment of country risk is the risk assessment of a country as related to the MNC's type of business.

The overall assessment of country risk thus consists of:

- Macro-political risk
- Macro-financial risk
- Micro-political risk
- Micro-financial risk

Note that the opinions of different risk assessors often differ due to subjectivities in identifying the relevant political and financial factors, determining the relative importance of each factor, and predicting the values of factors that cannot be measured objectively.

Thus, country risk helps in the assessment and avoidance of countries with excessive risk and frame policies for diversification and hedging which can also help mitigate this risk.

### **14.3 Measuring and Analyzing Country Risk**

Measuring and analyzing country risk isn't a straightforward task. Investors can adopt several different ways of assessment. Organization for Economic Cooperation and Development has outlined two ways of analysis

#### **Quantitative Analysis**

Risk measures like beta coefficients and risk denoting ratios (e.g., debt-to-GDP ratio) can be classified under quantitative methods. The Morgan Stanley Capital Investment Index, or the MSCI Index, is the most commonly used benchmark for many stocks, thus representing the entire global market under one roof. The beta coefficient for the MSCI Index of a country can be used as a measure of a country's risk.

#### **Qualitative analysis**

The qualitative analysis leans more towards the subjective aspects of measurement. This will not provide investors with a risk number but can give an obvious idea about the risk environment of a country. Any sudden political upheaval or changes in the market statistics can render a country's economy unstable, thus increasing its risk. Checking sovereign ratings and being updated with the latest changes helps investors to a great extent.

**Nature of Country Risk Assessment**

A **checklist approach** involves rating and weighting all the identified factors, and then consolidating the rates and weights to produce an overall assessment. A checklist approach will require the following steps-

- Assign values and weights to the political risk factors.
- Multiply the factor values with their respective weights, and sum up to give the political risk rating.
- Derive the financial risk rating similarly.
- Assign weights to the political and financial ratings according to their perceived importance.
- Multiply the ratings with their respective weights, and sum up to give the overall country risk rating.

**The Delphi technique** involves collecting various independent opinions and then averaging and measuring the dispersion of those opinions.

**Quantitative analysis** techniques like regression analysis can be applied to historical data to assess the sensitivity of a business to various risk factors.

**Inspection visits** involve traveling to a country and meeting with government officials, firm executives, and/or consumers to clarify uncertainties.

Often, firms use a variety of techniques for making country risk assessments. For example, they may use a checklist approach to develop an overall country risk rating, and some of the other techniques to assign ratings to the factors considered.

**Comparing Risk Ratings among Countries**

- One approach to comparing political and financial ratings among countries is the foreign investment risk matrix (FIRM).
- The matrix measures financial or economic risk on one axis and political risk on the other axis. Each country can be positioned on the matrix based on its financial and political risk.

**Incorporating Country Risk in Capital Budgeting**

- Adjustment of the Discount Rate: The higher the perceived risk, the higher the discount rate that should be applied to the project's cash flows.
- Adjustment of the Estimated Cash Flows: By estimating how the cash flows could be affected by each form of risk, the MNC can determine the probability distribution of the net present value of the project.

**Advantages of Country Risk Assessment**

- Country risk assessment keeps investors warned and aware of what to expect from an investment in a particular country.
- Not only investors but such analysis also helps corporations in formulating strategies suited to a particular country's environment. Such strategic planning helps them treat different countries differently.

**Disadvantages of Country risk Assessment**

- This is dependent on hundreds of factors, making its assessment difficult and not so accurate. The error of measurement or error of omission is bound to happen. Even the most sophisticated algorithms fail to capture all the factors accurately.
- Qualitative assessment is primarily based on the availability and inclusion of information. However, the report found is never perfect. So, it doesn't aptly capture everything.

**Raters of Country Risk**

- Credit ratings provide retail and institutional investors with information that assists them in determining whether issuers of bonds and other debt instruments and fixed-income securities will be able to meet their obligations.
- When they issue letter grades, credit rating agencies (CRAs) provide objective analyses and independent assessments of companies and countries that issue such securities.

**Need For Credit Rating**

- It is necessary in view of the growing number of cases of defaults in payment of interest and repayment of principal sum borrowed by way of fixed deposits, issue of debentures or preference shares or commercial papers.
- Maintenance of investor's confidence, since defaults shatter the confidence of investors in corporate instruments.
- Protect the interest of investors who cannot into merits of the debt instruments of a company.
- Motivate savers to invest in industry and trade.

**Benefits of Credit Rating – Investor**

Easy Understandability of Investment Proposal: The rating agencies give rating symbols to the instrument, which can be easily understood by investors. For e.g. AAA (Triple A), given by CRISIL for debentures ensures highest safety, whereas debentures rated D are in default or expect to default on maturity.

Choice of Instruments: Credit rating enables an investor to select a particular instrument from many alternatives available. This choice depends upon the safety or risk of the instrument.

Saves Investors Time and Effort: Credit ratings enable an investor to his save time and effort in analyzing the financial strength of an issuer company. He need not waste his time and effort to collect and analyze the financial information about the credit standing of the issuer company.

Improves Corporate Image: Credit rating helps to improve the corporate image of a company. High credit rating creates confidence and trust in the minds of the investors about the company. Therefore, the company enjoys a good corporate image in the market.

Lowers Cost of Borrowing: Companies that have high credit rating for their debt instruments will get funds at lower costs from the market. High rating will enable the company to offer low interest rates on fixed deposits, debentures and other debt securities. The investors will accept low interest rates because they prefer low risk instruments.

**Raters of Country Risk**

The global credit rating industry is highly concentrated, with three agencies:

- Moody's

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- Standard & Poor's
- Fitch

### **Credit Rating Agencies of India:**

- ONICRA Credit Rating Agency of India Ltd.
- Credit Rating Information Services of India Limited (CRISIL)
- Investment Information and Credit Rating Agency of India (ICRA)
- Credit Analysis & Research Limited (CARE)
- Duff & Phelps Credit Rating India Private Ltd. (DCR India)

### **Summary**

Country risks include risks arising from national differences in sociopolitical institutions, economic structures, policies, currencies, and geography. Country risk analysis identifies imbalances that increase the risks in cross-border investments. A country risk involves macro and micro assessment. It includes political factors, financial factors like economic, transfer and exchange risk.

For county risk several different ways of assessment are used like checklist method, Delphi method, quantitative analysis and inspection visits are used.

Credit rating also plays an important role in enhancing the role of investors. When they issue letter grades, credit rating agencies (CRAs) provide objective analyses and independent assessments of companies and countries that issue such securities.

### **Keywords**

**Economic risk:** It is a risk that arises from the negative changes in fundamental economic policy goals (fiscal, monetary, international, or wealth distribution or creation).

**Exchange risk:** It is defined as a form of risk that arises from the change in price of one currency against another. It is situation in which selected foreign operations put at risk due to adverse political developments.

**Transfer Risk:** It is risk which involves uncertainty regarding cross-border flows of capital.

**Country Risk Analysis:** It is the evaluation of possible risks and rewards from business experiences in a country. .

**The Delphi technique:** It involves collecting various independent opinions and then averaging and measuring the dispersion of those opinions. .

**Inspection visits:** It involves traveling to a country and meeting with government officials, firm executives, and/or consumers to clarify uncertainties

### **Self Assessment**

1. ----- is the risk arising from a decision by a foreign government to restrict capital movements. Restrictions could make it difficult to repatriate profits, dividends, or capital. .
  - A. Economic Risk
  - B. Transfer Risk
  - C. Emotional Risk
  - D. Not Applicable
2. ----- is the significant change in the economic structure or growth rate that produces a major change in the expected return of an investment.

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- A. Economic Risk
  - B. Transfer Risk
  - C. Emotional Risk
  - D. Not Applicable
3. ----- can be defined as a form of risk that arises from the change in price of one currency against another.
- A. Economic Risk
  - B. Transfer Risk
  - C. Emotional Risk
  - D. Exchange Risk
4. A ----- of country risk is an overall risk assessment of a country without consideration of the MNC's business.
- A. Macro assessment
  - B. Micro assessment
  - C. Depends on market
  - D. None of the above
5. A ----- of country risk is the risk assessment of a country as related to the MNC's type of business.
- A. Macro risk
  - B. Micro risk
  - C. Both of the above
  - D. None of the above
6. A ----- involves rating and weighting all the identified factors, and then consolidating the rates and weights to produce an overall assessment.
- A. Checklist approach
  - B. Delphi Technique
  - C. Inspection visits
  - D. None of the above
7. The ----- involves collecting various independent opinions and then averaging and measuring the dispersion of those opinions.
- A. Checklist approach
  - B. Delphi Technique
  - C. Inspection visits
  - D. None of the above
8. ----- involve traveling to a country and meeting with government officials, firm executives, and/or consumers to clarify uncertainties.
- A. Checklist approach
  - B. Delphi Technique
  - C. Inspection visits

D. None of the above

9. -----risk involves Uncertainty regarding expropriation.

- A. Transfer risk
- B. Operational Risk
- C. Control Risk
- D. Not Applicable

10. A country with too many political parties and frequent changes of government is -----risky.

- A. More
- B. Less
- C. Neither more or less
- D. Not Applicable

11. CRISIL stands for-----..

- A. Credit Rating Information Services of India Limited
- B. Credit Ration Information Services of India Limited
- C. Credit Rating Information Self of India Limited
- D. Not Applicable

12. Any sudden political upheaval or changes in the market statistics can render a country's economy unstable, thus increasing its risk. Checking sovereign ratings and being updated with the latest changes helps investors to a great extent.

- A. True
- B. False

13. Qualitative assessment is primarily based on the availability and inclusion of information. However, the report found is never perfect. So, it doesn't aptly capture everything.

- A. True
- B. False

14. Credit rating enables an investor to select a particular instrument from many alternatives available. This choice depends upon the safety or risk of the instrument.

- A. True
- B. False

15. Credit ratings enable an investor to his save time and effort in analyzing the financial strength of an issuer company.

- A. True
- B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. B  | 2. A  | 3. D  | 4. A  | 5. B  |
| 6. A  | 7. B  | 8. C  | 9. A  | 10. A |
| 11. A | 12. A | 13. A | 14. A | 15. A |

**Review Questions**

1. What do you mean by country risk analysis?
2. Enumerate the factors to be analyzed for country risk.
3. Elaborate various techniques for country risk assessment.
4. What are the benefits of credit rating

**Further Readings**

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**Web Links**

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## Unit 15: International Banking

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Summary

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### Objective

- Understand International banking & its perspective.
- Interpret reasons for international banking.
- Analyze challenges in international banking.
- Interpret implications of global trends and developments in international banking .

### Introduction

What is International Banking?

The industry was transformed in the 1970s. Until then most banks concentrated on their home markets, considering themselves as domestic institutions that handled foreign business.

With the rapid expansion of international networks, the banking sector occupies a pivotal position in the global economy as it has access to the capital, the technological capabilities, and the international network to facilitate these activities.

Banks monitor the business sector through the evaluation, pricing, and credit-granting functions.

In this context, the operations of an international trade of services, that have as a consequence either the creation or management of financial means, or the transport of capital from surplus units of country in another, or the mediation in the frame of national financier system are called "International Banking activity".

### 15.1 Meaning of International Banking

International banking is just like any other banking service, but it takes place across different nations or internationally.



To put it another way, it is an arrangement of financial services by a residential bank of one country to the residents of another country. Most multinational companies and individuals use this banking facility for transacting.



Example- International banking

Suppose Microsoft, an American company is functioning in London. It is in need of funds to meet its working capital requirements. In such a scenario, Microsoft can avail of the banking services in form of loans, overdrafts or any other financial service through banks in London. Here, the residential bank of London shall be giving its services to an American company. Therefore, the transaction between them is said to be a part of an international banking facility.

#### **Features and Benefits:**

- **Flexibility:** International banking facility provides flexibility to multinational companies to deal in multiple currencies. The major currencies that multinational companies or individuals can deal with include the euro, dollar, pounds, sterling, and rupee. The companies having headquarters in other countries can manage their bank accounts and avail of financial services in other countries through international banking without any hassle.
- **Accessibility:** International banking provides accessibility and ease of doing business to companies from different countries. An individual or MNC can use their money anywhere around the world.
- **International Bank Transfers/ Transaction:** International banking allows the business to make international bill payments. The currency conversion facility allows the companies to pay and receive money easily. Also, benefits like overdraft facilities, loans, deposits, etc. are available every time for overseas transactions.
- **Accounts Maintenance:** A multinational company can maintain the records of global accounts in a fair manner with the help of international banking. All the transactions of the company are recorded in the books of banks across the globe. By compiling the data and figures, the accounts of the company can be maintained.

#### **IBs – Services Offered:**

International Banks do everything domestic banks do and:

- Arrange trade financing.
- Arrange foreign exchange.
- Offer hedging services for foreign currency receivables and payables through forward and option contracts.
- Offer investment banking services (where allowed).
- Borrow or lend in Eurocurrency market.
- Underwrite Eurobonds and foreign bonds.
- International banks provide services to those engaged in international trade and investment: risk- sharing, liquidity, information.
- Like domestic banks, international banks accept deposits and lend.
- International banks lower transactions costs and lower information costs.
- International financial regulation can lead to innovation in banking.

#### **International Banks – Key Risks**

- International lending risk
- Country risk
- Credit Risk
- Currency Risk

- Foreign Exchange Risk

## 15.2 Reasons for International Banking

**Low Marginal Costs:** Managerial and marketing knowledge developed at home can be used abroad with low marginal costs.

**Knowledge Advantage:** The foreign bank subsidiary can draw on the parent bank's knowledge of personal contacts and credit investigations for use in that foreign market.

**Home Nation Information Services:** Local firms in a foreign market may be able to obtain more complete information on trade and financial markets in the multinational bank's home nation than is obtainable from foreign domestic banks.

**Wholesale Defensive Strategy:** Banks follow their multinational customers abroad to avoid losing their business at home and abroad.

**Prestige:** Very large multinational banks have high perceived prestige, which can be attractive to new clients.

**Regulatory Advantage:** Multinational banks are often not subject to the same regulations as domestic banks.

**Risk Reduction:** Greater stability of earnings due to diversification.

**Retail Defensive Strategy:** Multinational banks also compete for retail services such as travelers checks, tourist and foreign business market.

**Risk Reduction:** Greater stability of earnings due to diversification.

**Retail Defensive Strategy:** Multinational banks also compete for retail services such as travelers checks, tourist and foreign business market.

## 15.3 Types of International Banking Offices

### Correspondent Bank

The term correspondent bank refers to a financial institution that provides services to another one—usually in another country. It acts as an intermediary or agent, facilitating wire transfers, conducting business transactions, accepting deposits, and gathering documents on behalf of another bank.

Correspondent banking allows a bank's MNC client to conduct business worldwide through his local bank or its correspondents. The accounts held between correspondent banks and the banks to which they are providing services are referred to as Nostro and Vostro accounts.

Nostro and vostro are Latin terms used to describe the bank account that is shared by the correspondent or intermediary bank and the beneficiary bank. Nostro means ours, while vostro means yours. Domestic banks generally use correspondent banks to gain access to foreign financial markets and to serve international clients without having to open branches abroad.

## 15.4 How a Correspondent Bank Works

Correspondent banks are third-party banks. They act as middlemen between different financial institutions. As such, they provide Treasury services between sending and receiving banks, especially those in different countries—such as:

- Funds transfer
- Settlement
- Check clearing
- Wire transfers
- Currency exchange Nature of Country Risk Assessment

**Role of Correspondent Bank**

Correspondent banks are a pivotal part of the financial industry as they provide a way for domestic banks to operate when it isn't feasible for them to open up branches in a different location – especially in a foreign country.



For instance, a small domestic bank with clients in different countries can partner with a correspondent bank in order to meet the needs of its client internationally. Doing so also gives them access to the foreign financial market. The correspondent bank will, therefore, charge a fee for this service, which is usually passed off from the domestic bank to the customer.

**Representative Office:**

A representative office is a small service facility staffed by parent bank personnel that is designed to assist MNC clients of the parent bank in dealings with the bank's correspondents.

An office opened in a foreign market as a first step for establishing a relationship with potential buyers or sellers. This type of office allows a company to show its commitment to the new market while permitting more intense on-the-ground research. It is useful when the bank has many MNC clients in a country. Representative offices also assist with information about local business customs, and credit evaluation of the MNC's local customers.

**Foreign Branch Bank:**

A foreign branch bank operates like a local bank but is legally part of the parent subject to both the banking regulations of home country and foreign country.



For example, suppose that Bank of America opens a foreign bank branch in Canada. The branch would be legally obligated to follow both Canadian and American banking regulations in many cases. In actual practice, foreign bank branches are sometimes exempted from specific rules in one country or the other. A foreign branch bank can provide a much fuller range of services than a representative office.

The foreign bank branch has loan limits based on the total bank capital; they can provide more loans than subsidiary banks. That is because the foreign bank branch, while possibly small in one market, is technically part of a larger bank. Hence, it enjoys the capital base of the larger entity.

**Advantages of Foreign Bank Branches**

Foreign bank branches may face special difficulties during an economic or political crisis. Since they operate in that foreign country during a crisis, they will be negatively impacted by events there.

A government in crisis is more likely to use its limited resources to support domestic banks. Foreign banks might be left to bail out their own branches. This situation is different from a subsidiary bank, which is technically a domestic company in the foreign country. Subsidiary banks are also sometimes joint ventures with domestic banks, further increasing the chances that the local government will support them. The Delphi technique involves collecting various independent opinions and then averaging and measuring the dispersion of those opinions.

**Subsidiary Bank:**

A subsidiary bank is a type of foreign entity that is located and incorporated in a foreign country but is either wholly-owned or owned in a major part by a parent corporation in a different nation.

This particular banking model helps the parent company avoid unfavorable regulations enforced by the home country. Subsidiary banks don't adhere to regulations that apply in the home country or nations where the parent company is incorporated. Instead, they operate under the laws and regulations of the host country.

### **Affiliate**

Affiliate is used primarily to describe a business relationship wherein one company owns less than a majority stake in the other company's stock. Affiliate is also commonly used in the retail sector. In this case, one company becomes affiliated with another in order to sell its products or services, earning a commission for doing so. This term is now used widely in partnerships among online companies in which the affiliate supports another company by channeling internet traffic and e-sales. An affiliate bank is one that is partly owned but not controlled by the parent.

### **Affiliates vs. Subsidiaries**

Both subsidiary and affiliate banks operate under the banking laws of the country in which they are incorporated. They are allowed to underwrite securities.

Unlike an affiliate, a subsidiary's majority shareholder is the parent company. As the majority shareholder, the parent company owns more than 50% of the subsidiary and has a controlling stake. The parent thus has a great deal of control over the subsidiary and is allowed to make important decisions such as the hiring and firing of executives, and the appointment of directors on the board.

### **Offshore Banking**

An offshore banking center is a country whose banking system is organized to permit external accounts beyond the normal scope of local economic activity.

Offshore banking describes a relationship that a company or individual has with a financial institution outside the country of their residence. This requires opening a bank account, making deposits, withdrawals, and transfers from that account—the exact same way you would with a bank account at home. The host country usually grants complete freedom from host-country governmental banking regulations.

## **15.5 Top Banking Industry Challenges**

The banking industry is undergoing a radical shift, one driven by new competition from Fintech, changing business models, mounting regulation and compliance pressures, and disruptive technologies.

As data breaches become prevalent and privacy concerns intensify, regulatory and compliance requirements become more restrictive as a result. These and other banking industry challenges can be resolved by the very technology that's caused this disruption, but the transition from legacy systems to innovative solutions hasn't always been an easy one.

### **Increasing Competition**

The threat posed by Fintech, which typically target some of the most profitable areas in financial services, is significant. Goldman Sachs predicted that startups would account for upwards of \$4.7 trillion in annual revenue being diverted from traditional financial services companies. These new industry entrants are forcing many financial institutions to seek partnerships and/or acquisition opportunities as a stop-gap measure. In order to maintain a competitive edge, traditional banks and credit unions must learn from Fintech, which owe their success to providing a simplified and intuitive customer experience.

### **A Cultural Shift**

From artificial intelligence (AI)-enabled wearable's that monitor the wearer's health to smart thermostats, technology has become ingrained in our culture — and this extends to the banking

industry. In the digital world, there's no room for manual processes and systems. Banks and credit unions need to think of technology-based resolutions to banking industry challenges. Therefore, it's important that financial institutions promote a culture of innovation, in which technology is leveraged to optimize existing processes and procedures for maximum efficiency. This cultural shift toward a technology-first attitude is reflective of the larger industry-wide acceptance of digital transformation.

### **Regulatory Compliance**

Regulatory compliance has become one of the most significant banking industry challenges as a direct result of the dramatic increase in regulatory fees relative to earnings and credit losses since the financial crisis. From Basel's risk-weighted capital requirements to the Dodd-Frank Act, and from the Financial Account Standards Board's Current Expected Credit Loss to the Allowance for Loan and Lease Losses, there are a growing number of regulations that banks and credit unions must comply with.

Faced with severe consequences for non-compliance, banks have incurred additional cost and risk in order to stay up to date on the latest regulatory changes and to implement the controls necessary to satisfy those requirements. Overcoming regulatory compliance challenges requires banks and credit unions to foster a culture of compliance within the organization, as well as implement formal compliance structures and systems.

### **Changing Business Models**

Changing banking industry challenges forcing institutions to change the way they do business. The increasing cost of capital combined with sustained low-interest rates, decreasing return on equity, and decreased proprietary trading are all putting pressure on traditional sources of banking profitability. In spite of this, shareholder expectations remain unchanged.

This culmination of factors has led many institutions to create new competitive service offerings, rationalize business lines, and seek sustainable improvements in operational efficiencies to maintain profitability.

### **Rising Expectations**

Today's consumer is smarter, savvier, and more informed than ever before and expects a high degree of personalization and convenience out of their banking experience. Changing customer demographics play a major role in these heightened expectations.

Millennia's have led the charge to digitization, with five out of six reporting that they prefer to interact with brands via social media; when surveyed, millennial's were also found to make up the largest percentage of mobile banking users, at 47%. Based on this trend, banks can expect future generations, starting with Gen- Z, to be even more invested in Omni channel banking and attuned to technology. How can they satisfy older generations and younger generations of banking customers at the same time? The answer is a hybrid banking model that integrates digital experiences into traditional bank branches.

Investor expectations must be accounted for, as well. Annual profits are a major concern after all, stakeholders need to know that they'll receive a return on their investment or equity and, in order for that to happen, banks need to actually turn a profit.

### **Customer Retention**

Financial services customers expect personalized and meaningful experiences through simple and intuitive interfaces on any device, anywhere, and at any time. Customer loyalty is a product of rich client relationships that begin with knowing the customer and their expectations, as well as implementing an ongoing client-centric approach.

In an Accenture Financial Services global study of nearly 33,000 banking customers spanning 18 markets, 49% of respondents indicated that customer service drives loyalty. By knowing the customer and engaging with them accordingly, financial institutions can optimize interactions that result in increased customer satisfaction and wallet share, and a subsequent decrease in customer churn.

### **Outdated Mobile Experiences**

These days, every bank or credit union has its own branded mobile application however, just because an organization has a mobile banking strategy doesn't mean that it's being leveraged as effectively as possible. A bank's mobile experience needs to be fast, easy to use, fully-featured

(think live chat, voice-enabled digital assistance, and the like), secure, and regularly updated in order to keep customers satisfied.

### Security Breaches

With a series of high-profile breaches over the past few years, security is one of the leading banking industry challenges, as well as a major concern for bank and credit union customers.

AVS “checks the billing address submitted by the card user with the cardholder’s billing address on record at the issuing bank” in order to identify suspicious transactions and prevent fraudulent activity.

End-to-End Encryption “is a method of secure communication that prevents third-parties from accessing data while it’s transferred from one end system or device to another.”

Biometric authentication “is a security process that relies on the unique biological characteristics of an individual to verify that he is who he says he is. Biometric authentication systems compare a biometric data capture to stored, confirmed authentic data in a database.”

Location-based authentication also known as geolocation identification “is a special procedure to prove an individual’s identity and authenticity on appearance simply by detecting its presence at a distinct location.”

Out-of-band authentication (OOBA) refers to “a process where authentication requires two different signals from two different networks or channels. By using two different channels, authentication systems can guard against fraudulent users that may only have access to one of these channels.”

Risk-based authentication (RBA) also known as adaptive authentication or step-up authentication “is a method of applying varying levels of stringency to authentication processes based on the likelihood that access to a given system could result in its being compromised.”

### Antiquated Applications

According to the CIO Survey, over 50% of financial services CIOs believe that a greater portion of business will come through digital channels, and digital initiatives will generate more revenue and value. However, organizations using antiquated business management applications or siloed systems will be unable to keep up with this increasingly digital-first world. Without a solid, forward-thinking technological foundation, organizations will miss out on critical business evolution. In other words, digital transformation is not just a good idea – it’s become imperative for survival.

While technologies such as blockchain may still be too immature to realize significant returns from their implementation in the near future, technologies like cloud computing, AI, and bots all offer significant advantages for institutions looking to reduce costs while improving customer satisfaction and growing wallet share.

### Continuous Innovation

Sustainable success in business requires insight, agility, rich client relationships, and continuous innovation. Benchmarking effective practices throughout the industry can provide valuable insight, helping banks and credit unions stay competitive. However, benchmarking alone only enables institutions to keep up with the pack – it rarely leads to innovation. Businesses must benchmark to survive, but innovate to thrive; innovation is a key differentiator.

Innovation stems from insights, and insights are discovered through customer interactions and continuous organizational analysis.

### Challenges for International Banks in Foreign Market

- Growing customer use of securities markets to raise funds in a more volatile and risky world.
- Developing better methods for assessing risk in international lending.
- Adjusting to new market opportunities created by deregulation and new international agreements.

### Solutions to Troubled International Loans

- They may be restructured.

- They can be sold in the secondary market.
- They can be written off.
- Either a portion or in its entirety.

### **International Loan Risk Evaluation Systems**

The Checklist Approach

The Delphi Method

Advanced Statistical Methods

Published Country-Risk Indicators

- Euro money Magazine
- Institutional Investor Index
- International Country Risk Guide

### **New Opportunities**

Opportunities created by the North American Free Trade Agreement (NAFTA) and the Central American Free Trade Agreement (CAFTA). Opportunities in the expanding European community. Opportunities in Asia as barriers erode.

### **Risks in International Banking**

When an organization decides to engage in international financing activities, it takes on additional risk along with the opportunities. The main risks that are associated with businesses engaging in international finance include foreign exchange risk and political risk.

These challenges may sometimes make it difficult for banks to maintain constant and reliable revenue.

### **Foreign Exchange Risk**

Foreign exchange risk occurs when the value of an investment fluctuates due to changes in a currency's exchange rate.



For example, assume a U.S. car company receives a majority of its business in Japan. If the Japanese yen depreciates against the U.S. dollar, any yen-denominated profits the company receives from its Japanese operations will yield fewer U.S. dollars compared to before the yen's depreciation. Foreign exchange risk typically affects businesses that export and/or import their products, services, and supplies.

### **Political Risk**

Geopolitical risk, also known as political risk, transpires when a country's government unexpectedly changes its policies, which now negatively affect the foreign company. These policy changes can include such things as trade barriers, which serve to limit or prevent international trade.

Tariffs and quotas are used to protect domestic producers from foreign competition. This also can have a huge effect on the profits of an organization because it either cuts revenues from the result of a tax on exports or restricts the amount of revenues that can be earned.

### **Credit risk**

Credit risk is most simply defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters.

### **Operational Risk**

Operational risk is the risk of loss due to errors, interruptions, or damages caused by people, systems, or processes. The operational type of risk is low for simple business operations such as retail banking and asset management, and higher for operations such as sales and trading. Losses that occur due to human error include internal fraud or mistakes made during transactions. An example is when a teller accidentally gives an extra \$50 bill to a customer.

On a larger scale, fraud can occur through breaching a bank's cyber security. In such a situation, banks lose capital and trust from customers. Damage to the bank's reputation can make it more difficult to attract deposits or business in the future.

### **Market Risk**

Market risk mostly occurs from a bank's activities in capital markets. It is due to the unpredictability of equity markets, commodity prices, interest rates, and credit spreads. Banks are more exposed if they are heavily involved in investing in capital markets or sales and trading. So, to decrease market risk, diversification of investments is important. Other ways banks reduce their investment include hedging their investments with other, inversely related investments.

### **Liquidity Risk**

Liquidity risk refers to the ability of a bank to access cash to meet funding obligations. Obligations include allowing customers to take out their deposits. The inability to provide cash in a timely manner to customers can result in a snowball effect. Reasons that banks face liquidity problems include over-reliance on short-term sources of funds, having a balance sheet concentrated in illiquid assets, and loss of confidence in the bank on the part of customers. Mismanagement of asset-liability duration can also cause funding difficulties.

### **Reflections on the future of International Banking**

The recent crisis highlighted deficiencies in the way many international banks conducted their business and managed financial risks. It also exposed gaps in the regulatory environment.

The rapid transmission of shocks across the global financial system through internationally active banks, together with the concurrent macroeconomic problems, has prompted calls for improvements to these banks' business models that will strengthen their risk and liquidity management.

These broad trends have a bearing on a next secular change, which is in the regulatory environment. Authorities envisage a new regulatory environment in which banks hold stronger capital and liquidity buffers and build balance sheets that are resilient to funding

Shocks.

As jurisdictions hosting foreign banks realized that they were exposed to risks generated in third countries, calls were heard for a greater decentralisation of the international banking model.

However, while a more decentralised model in which a greater portion of banking operations are funded, managed and supervised in the same location – could restrict the spillover of adverse shocks across national borders, such a model would also increase the dependence of economic agents on local economic and financial conditions and could hinder the efficient flow of funds across borders.

The trade-offs associated with a move towards greater decentralisation in international banking illustrate how difficult it is to design a financial system that is immune to all conceivable shocks. Rather than trying to design a foolproof system, policymakers may find it more effective to focus their efforts on strengthening mechanisms that prevent the build-up of excessive cross-border and local risks, as well as improving capital and liquidity management.

## **15.6 International Banking**

International Banking can be defined as a subset of commercial banking transactions and activity having a cross border and/or cross country element.

International banking comprises a range of transactions that can be distinguished from domestic operations by:

- The currency of denomination.
- The residence of the banks customers.
- The location of the office.
- **Characteristics and Dimensions**



Banks in the 19th century promoted two different types of international lending:

- Trade Financing,
- Investment Banking.

Trade financing was used to finance commodity exports and imports or to deal in foreign exchange. It is a short term commercial lending. Investment banking is concerned with investment of long term funds in fixed interest securities and equity issues.

Trade financing was a small part in the 19th century, more important was the development of investment banking. The international banking became one of the great victim of the Great Depression and the second world war. Bank failures, default shattered the confidence in international lending.

The most remarkable development was the internationalization of banking. The banks that took the lead were institutions from Canada, France, Germany, UK etc. The number of participants which at the beginning were mainly American banks has increased to German, UK, Japan etc.

Many major banks have more international loans outstanding than domestic ones. Large part of deficit of least developed countries has been financed by Commercial banks. The amount of individual loans has increased thus increasing the risk from individual borrowers.

International banking since the 1950s has taken place mainly offshore, where lenders and borrowers transact in currencies foreign to them both. Regulatory arbitrage, financial liberalization and financial innovation drove a multi-decade expansion of international banking, which peaked at over 60% of world GDP on the eve of the Great Financial Crisis. Competition among banks for market share contributed to surges in international lending that amplified credit booms preceding major financial crisis. Losses during the Great Financial Crisis, and regulatory reforms in its wake, constrained banks' expansion and accelerated the rise of non-bank financial institutions as international creditors.

### **Effects of international banking**

From a long-term perspective, international banking has contributed to world economic progress. The internationalization of banking has closely tracked the growth in international trade for long periods in the past, suggesting that real and financial globalization are closely intertwined.

International banking has been an important driver of global integration and economic development, supporting the efficiency of multinational firms and helping to exploit the growth potential of both developed and emerging market economies. In addition, the establishment of local operations by foreign banks has often enhanced the effectiveness of emerging market financial systems.

- Impact on the risk of individual banks
- Impact on systemic risk
- Impact on the macro economy

## **15.7 Trends In International Banking**

The banking industry is on the cusp of adopting digitization and new-age technologies. In recent decade digital technologies such as artificial intelligence and machine learning have enthusiastically been adopted by the industry to address the challenges brought about by COVID-19.

The market capitalization of the global banking sector was 7.5 trillion euros in the second quarter of 2021.

### **Global technology trends**

The following global technology trends which are expected to drive an increased investment in technology:

- Increased focus on next-generation remote banking solutions:

- Next-generation online and remote banking solutions are expected to enable customer self-service and reduce costs.
- Drive towards core banking platform replacement:
- Rather than slowing renewal activity in core banking, the financial crisis served to accelerate it through new reforms.
- Increased role of business intelligence and analytics in transaction monitoring:
- New regulations will drive changes in analytics, business intelligence, master data management (MDM), and reporting.
- Increased focus on enterprise payments hubs in payments processing:
- Redesigning payment processing into payment hubs can enable banks to implement revenue- and cost-focused strategies.

**Regional Trend 1:** In Europe, Implementation of CRM to Enhance Channel Capabilities:

CRM helps in strengthening customer relationships and in being prepared to better meet changing customer needs.

**Regional Trend 2:** In Asia and Other Emerging Markets, Enhancement of Multi-Channel Technology Capabilities:

Changing consumer preferences for multichannel banking are driving IT investments into online and mobile channels.

**Regional Trend 3:** In the U.S., Rising Importance of Remote Deposit Capture

Remote Deposit Capture solutions need to handle the image and data capture requirements for multiple channels.

## Banking Trends after Pandemic

### 1. Everyone wants to be a super-app

Super-apps are dominating more aspects of the digital world and human interaction. Banks face a high-stakes choice to compete or collaborate.

### 2. Green gets real

As ESG concerns grow, banks are being urged to become guardians of our planet. There will be costs – but the returns are sure to make it worthwhile.

### 3. Innovation makes a comeback

To keep up with fintech and other competitors, banks are rediscovering their creative mojo and asking a simple, powerful question: “Why not?”

### 4. Fees... a magical mystery tour

“Free” products from digital-only challengers and BNPL firms are forcing banks to be more transparent – and more creative – with fee structures.

### 5. The digital brain gets a caring heart

Banks are looking for ways to have meaningful conversations with customers in digital spaces. Technology like AI can help make the human connection.

### 6. Digital currencies head for college

With crypto currencies here to stay, experiments like CBDCs are gathering momentum. The search is on for use cases that prove the economic benefits. Smart operations put zero in their sights. Artificial intelligence and machine learning in banking now surpass humans in some tasks. Applying this tech will bring zero waste operations within reach.

### 8. Payments: anywhere, anytime ... and now anyhow

The next payments revolution will stem from open networks, which empower banks to reimagine their payments offerings for newly-demanding customers.

**9. Banks get on the road again**

The search for growth will include international markets after pandemic.

**10. The war for talent intensifies**

The pandemic disrupted the supply chain for banks' most critical asset talent. Competition is rising.

**Some Open Issues**

The new digital world leaves many issues open for research. A fundamental one is:

- What is a bank today? Can the core bank functions of handling both deposits and loans be unbundled?
- What is the optimal policy of central banks with respect to digital currencies?
- Should central banks supply their own digital currency or allow private digital currency providers to access reserves?
- How will block chain technology and smart contracts change financial contracting and impact competition?
- How will the new digital marketing and price discrimination techniques interact with the behavioral biases of consumers and investors?
- What role will new entrants play in providing credit to people and firms that cannot post collateral?
- To what extent will dynamic economies of scale and scope lead to a natural oligopoly structure in banking?
- How do we assign property rights on data and data portability rules to maximize welfare?
- How do we design systemic risk indicators for cyber-exposure?

**Key Takeaways**

'Expecting The Unexpected' is one of the key takeaways for mankind across the globe from the COVID-19 pandemic.

If Banks and Financial institutions have received one clear signal from this unprecedented disruption, it is that resilience and readiness are essential levers for business continuity. These need to be revisited or reevaluated from time to time by banks and financial institutions.

They need to rethink their growth strategy and transform themselves as customer expectations has changed dramatically. Every customer action and touch point are required to be redesigned with digital capabilities and remote accessibility. Banks need to model their solutions inclined to customer expectations, moving away from Product or Business centric approach.

The new generations (Gen Z) possess the zeal towards technology and innovations and are willing to go an extra mile for real time solutions. They are susceptible to churn and banks can easily lose them due to inefficiency and delay in services. Seamless experience and real value will help banks retain such customers.

Banks should empower customers through more insights and access; be a value partner and not just a retailer. There is a huge surge in large-scale technology transformation in the banking sector, not just in Retail and Small Business banking but similar traction is evident in Commercial banking of all scale and geography. As anticipated, every such Digital transformation is combined with intelligent automation, data analytics and cloud to make the transformation seamless.

**Summary**

International banking is an arrangement of financial services by a residential bank of one country to the residents of another country. There are several reasons for international banking like low marginal costs, knowledge advantage etc. There are several types of International banking office each having its own reasons and advantages.

The banking industry is also facing several types of challenges which include security and technology. The same applies to risk in International banking like foreign exchange risk, political risk, credit risk, operational risk market risk and liquidity risk. The trends in International banking is also changing and banking needs to be updated as per the trends.

### **Keywords**

**Foreign Exchange Risk:** It is a risk that arises from the due to changes in a currency's exchange rate.

**Political Risk:** It is risk due a country's government unexpectedly changes its policies, which now negatively affect the foreign company.

**Credit Risk:** It is risk which involves counterparty will fail to meet its obligations in accordance with agreed terms..

**Operational Risk:** It is the risk of loss due to errors, interruptions, or damages caused by people, systems, or processes.

**Affiliate:** It is used primarily to describe a business relationship wherein one company owns less than a majority stake in the other company's stock

### **Self Assessment**

1. Nostro means -----, while vostro means -----.

  - A. Ours, Yours
  - B. Yours, Ours
  - C. Both of the above
  - D. Not Applicable

  
2. A ----- is a small service facility staffed by parent bank personnel that are designed to assist MNC clients of the parent bank in dealings with the bank's correspondents.

  - A. Foreign Branch Bank
  - B. Representative office
  - C. Subsidiary Bank
  - D. Not Applicable

  
3. A ----- is a type of foreign entity that is located and incorporated in a foreign country but is either wholly-owned or owned in a major part by a parent corporation in a different nation.

  - A. Foreign Branch Bank
  - B. Representative office
  - C. Subsidiary Bank
  - D. Not Applicable

  
4. ----- is a security process that relies on the unique biological characteristics of an individual to verify that he is who he says he is. Biometric authentication systems compare a biometric data capture to stored, confirmed authentic data in a database.

  - A. Biometric authentication
  - B. Location-based authentication
  - C. Depends on market
  - D. None of the above

5. -----also known as geolocation identification is a special procedure to prove an individual's identity and authenticity on appearance simply by detecting its presence at a distinct location.
- A. Location-based authentication
  - B. Biometric authentication
  - C. Both of the above
  - D. None of the above
6. ----- also known as adaptive authentication or step-up authentication is a method of applying varying levels of stringency to authentication processes based on the likelihood that access to a given system could result in its being compromised.
- A. Risk-based authentication
  - B. Biometric authentication
  - C. Both of the above
  - D. None of the above
7. ----- occurs when the value of an investment fluctuates due to changes in a currency's exchange rate.
- A. Political risk
  - B. Credit risk
  - C. Foreign exchange risk
  - D. None of the above
- 8 ----- risk is defined as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms.
- A. Political risk
  - B. Credit risk
  - C. Foreign exchange risk
  - D. None of the above
9. ----- is the risk of loss due to errors, interruptions, or damages caused by people, systems, or processes.
- A. Political risk
  - B. Operational risk
  - C. Control risk
  - D. Not Applicable
10. -----refers to the ability of a bank to access cash to meet funding obligations. Obligations include allowing customers to take out their deposits.
- A. Liquidity risk
  - B. Political risk
  - C. Control risk
  - D. Not Applicable

Unit 15: International Banking

11. The goal of credit risk management is to ----- a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters.

- A. Maximize
- B. Minimize
- C. Both of the above
- D. Not Applicable

12. An offshore banking center is a country whose banking system is organized to permit external accounts beyond the normal scope of local economic activity.

- A. True
- B. False

13. Affiliate is used primarily to describe a business relationship wherein one company owns less than a majority stake in the other company's stock.

- A. True
- B. False

14. A bank's mobile experience needs to be fast, easy to use, fully featured (think live chat, voice-enabled digital assistance, and the like), secure, and regularly updated in order to keep customers satisfied.

- A. True
- B. False

15. End-to-End Encryption is a method of secure communication that prevents third parties from accessing data while it's transferred from one end system or device to another.

- A. True
- B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. C  | 4. A  | 5. A  |
| 6. A  | 7. C  | 8. B  | 9. B  | 10. A |
| 11. A | 12. A | 13. A | 14. A | 15. A |

**Review Questions**

- 1) What are the reasons for international banking?
- 2) Enumerate the types of international banking offices.
- 3) Elaborate various risks in international banking.
- 4) Enumerate the types of challenges in international banking.

**Further Readings**

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## Unit 16: International Money Market

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### Objective

- Interpret implications of International money market
- Explore different instruments in International money market.
- Understand meaning of forward rate agreements (FRA) and Euro Credits.
- Interpret working and implications of forward rate agreements (FRA) and Euro Credits.

### Introduction

Money market is a set of institutions, conventions, and practices, the aim of which is to facilitate the lending and borrowing of money on a short-term basis. The money market is, therefore, different from the capital market, which is concerned with medium- and long-term credit.

The definition of money for money market purposes is not confined to bank notes but includes a range of assets that can be turned into cash at short notice, such as short-term government securities, bills of exchange, and bankers' acceptances.

The money market is, therefore, different from the capital market, which is concerned with medium- and long-term credit.

Every country with a monetary system of its own has to have some kind of market in which dealers in short-term credit can buy and sell.

### 16.1 International Money Markets

In the financial world, almost every asset is for trade may it being commodities, stocks, bonds, and even foreign money are constantly bought and sold. Currencies are instruments for paying, but they are also investment products because of the constant fluctuations in their prices. The money market handles the supply and demand of money, which behaves just like other goods and assets. When the supply surpasses demand more liquidity than goods to buy with it), the value of money falls. When the demand grows, the value goes up. However, most countries have their own currency, so they need to exchange local currency for that of trade partners in order to complete commercial and financial operations.

The International Monetary Market (IMM) was introduced in December 1971 and formally implemented in May 1972, although its roots can be traced to the end of Bretton Woods through the 1971 Smithsonian Agreement and Nixon's suspension of U.S. dollar's convertibility to gold. When the demand grows, the value goes up. However, most countries have their own currency, so they need to exchange local currency for that of trade partners in order to complete commercial and financial operations. The International Monetary Market (IMM) was introduced in December 1971 and formally implemented in May 1972, although its roots can be traced to the end of Bretton Woods through the 1971 Smithsonian Agreement and Nixon's suspension of U.S. dollar's convertibility to gold. International banking is just like any other banking service, but it takes place across different nations or internationally.

To put it another way, it is an arrangement of financial services by a residential bank of one country to the residents of another country. Most multinational companies and individuals use this banking facility for transacting.

### **International Money Markets-Reason**

The growth in International business has caused corporation and government to need short term foreign currency. They need short term foreign currency to make payments. They need fund to support local operation they need to borrow in currency in which interest rate is low. They consider borrowing in a currency that will depreciate against their home currency as they would be repay the Loan at favorable rate over time. Meanwhile there are some corporations that have motive to invest in foreign currencies.

**First** the interest rate they would receive from home currencies may be lower than the foreign currencies.

**Secondly** they will like to invest in a currency that will appreciate against their home currency and will convert in home currency at favorable rate in future.

This sell and purchase currencies has created International Money market.

### **What is the Purpose of a Money Market?**

#### **1. Maintains Liquidity in the Market**

One of the most crucial functions of the money market is to maintain liquidity in the economy. Some of the money market instruments are an important part of the monetary policy framework. Central bank uses these short-term securities to get liquidity in the market within the required range.

#### **2. Provides Funds at a Short Notice**

Money Market offers an excellent opportunity to individuals, small and big corporations, banks of borrowing money at very short notice. These institutions can borrow money by selling money market instruments and finance their short-term needs.

#### **3. Utilization of Surplus Funds**

Money Market makes it easier for investors to dispose of their surplus funds, retaining their liquid nature, and earn significant profits on the same. It facilitates investors' savings into investment channels. These investors include banks, non-financial corporations as well as state and local government.

#### **4. Aids in Financial Mobility**

Money Market helps in financial mobility by allowing easy transfer of funds from one sector to another. This ensures transparency in the system. High financial mobility is important for the overall growth of the economy, by promoting industrial and commercial development.

#### **5. Helps in monetary policy**

A developed money market helps Central bank in efficiently implementing monetary policies. Transactions in the money market affect short term interest rate, and short-term interest rates gives an overview of the current monetary and banking state of the country. This further helps Central bank in formulating the future monetary policy, deciding long term interest rates, and a suitable banking policy.

## Participants & Transaction

Each central bank usually holds some form of reserve that is acceptable in settling international transactions. International monetary reserves are mainly gold, or “money market assets” in some country whose currency is widely used, such as the United States dollar.

The monetary laws of all countries provide for the establishment of some kind of parity between their currencies and those of other countries. Because world trade continually gives rise to various needs for payment in various currencies, an international money market must exist so that traders with an excess of one currency can use it to buy another currency for which they have a need. Within the scope of convertibility arrangements, this trading in currencies is carried out by skilled intermediaries, usually banks or specialized foreign exchange brokers and dealers. Trading in currencies is extensive both for immediate use (“spot”) and for future (“forward”) delivery.

Unlike share markets, the international money market sees very large funds transfer. The players of the market are not individuals; they are very big financial institutions. The international money market investments are less risky and consequently, the returns obtained from the investments are less too. The best and most popular investment method in the international money market is via money market mutual funds or treasury bills.

To measure the exchange rate between currencies, the international money market often works with pairs.



For example, EUR/USD tracks the exchange rate between euros and U.S. dollars, GBP/USD indicates trade between British pounds and U.S. dollars, and USD/JPY refers to the exchange of U.S. dollars for Japanese yens. Although some pairs compare currencies other than the U.S. dollar, most pairs measure the value of one currency against American money. Therefore, the U.S. dollar is the most actively traded currency.

Two important component of International Money market are European money market and Asian money market. The origin of European market traced back to Euro currency market development in 1960-70. As dollar was dominant currency as medium of trade demand for dollar in Europe increased. To conduct trade US Corporation in US deposited dollar in European bank.

Eurocurrency is a time deposit in an international bank located in a country different than the country that issued the currency.



Example: Eurodollars are U.S. dollar-denominated time deposits in banks located outside the United States. Euroyen are yen-denominated time deposits in banks located outside of Japan.

OPEC also contributed growth of Euro currency market which generally requires payment of oil in dollars. OPEC generally deposits a portion of their oil revenue. These deposits are lent to oil importing countries. These dollar denominated deposits are known as petro dollars. Asian money market-Like Europe Asian money market was originated as a market involving dollar denominated deposits. Hence it is known as Asian dollar market. Today market is centered in Hong Kong and Singapore where large bank accept deposits and make loan in various foreign currencies. Euro credits are short-to-medium-term loans of Eurocurrency extended by Euro banks to corporations, sovereign governments, nonprime banks, or international organizations. The loans are denominated in currencies other than the home currency of the Euro bank. Because these loans are too large to be handled by a single bank, Euro banks will band together to form a bank lending syndicate to share the risk. Euro credits feature an adjustable rate. On Euro credits originating in London the base rate is LIBOR.

## Financial Crises and Liquidity

In financial crisis situations, central bankers must provide liquidity to stabilize markets because risk may trade at premiums to a bank's target rates, called money rates, which central bankers can't control. Central bankers then provide liquidity to banks that trade and control rates. These are called repo rates, and they are traded through the IMM. Repo markets allow participants to

undertake rapid refinancing in the interbank market independent of credit limits to stabilize the system.

## **16.2 Instruments in Money Market**

The term 'Money Market' is used to define a market where short-term financial assets with a maturity up to one year are traded.

In other words, the money market is mechanisms which facilitate the lending and borrowing of instruments which are generally for a duration of less than a year. High liquidity and short maturity are typical features which are traded in the money market.

### **Treasury bill**

T-bills) are the most marketable money market security. It is short-term debt obligations of a national government that are issued to mature in three to twelve months.

T-bills are purchased for a price that is less than their PAR (face) value; when they mature, the government pays the holder the full par value.

Effectively, your interest is the difference between the purchase price of the security and what you get at maturity. For example, if you bought a 90-day T-bill at \$9,800 and held it until maturity, you would earn \$200 on your investment. Treasury bills are issued through a competitive bidding process at auctions.

### **How to calculate the yield on Treasury bills?**

To calculate the yield, the comparison of par value to its face value is the first step. Additionally, investment returns are more useful when expressed on an annualized basis. You can calculate the yield of treasury bills through the following formula -

$$Y = (100 - P) / P * [(365 / D) * 100], \text{ where}$$

Y - Yield/ return percentage of T-bill

P - The discounted price of the T-bill purchased

D - Tenure of T-bill

Let's understand this with an illustration. If Central bank issues a 91- Day treasury bill at the discounted price of Rs.97 while the face value of the bill is Rs.100, the yield of the security can be determined as follows -

$$\begin{aligned} \text{Yield} &= [(100 - 97) / 97] * (365 / 91 * 100) \\ &= 12.40\% \end{aligned}$$

### **Advantages and limitations of treasury bills**

Treasury bills investments come with many advantages as it provides safety and security to its investors.

#### **Risk-Free**

A treasury bill is a popular short term government security. The Central government backs them. They act as a liability to the Central bank government as they need to be paid within a stipulated time.

#### **Highly Liquid**

Treasury bill has a highest maturity period of 364 days. They help in raising money for short term requirements for the economy. Individuals who are looking for short term investments can park their funds here. Also, T-bills can be sold in the secondary market. This allows investors to convert their holding into cash during any emergency.

#### **Bidding**

Treasury bills are usually auctioned by Central bank every week. This allows the retail investors to place their noncompetitive bids. This increases the exposure of investors to the government bond market, which creates higher cash flows to the capital market.

### Limitations of Treasury Bills

Compared to other stock market investment tools, treasury bills yield lower returns as they are government-backed debt securities. Treasury bills issued at a discount and redeemed at face value. Therefore, the returns earned by investors in T-bills remains fixed throughout the bond tenure irrespective of the economic condition of the country. When the stock market moves upwards, the yield generated by equity, equity fund, debt fund or debt instruments is also higher. However, the returns generated by T-bills remain fixed irrespective of the financial market movements.

### Certificate of deposit

A Certificate of Deposit is a type of money market instrument issued against the funds deposited by an investor with a bank in a dematerialized form for a specific period of time. CD- Time deposit, commonly offered to consumers by banks, thrift institutions, and credit unions.

They bear a specific maturity date (from three months to five years), a specified interest rate, and can be issued in any denomination, much like bonds. Like all time deposits, the funds may not be withdrawn on demand like those in a checking account. CDs offer a slightly higher yield than T-Bills because of the slightly higher default risk for a bank but, overall, the likelihood that a large bank will go broke is pretty slim.

Of course, the amount of interest you earn depends on a number of other factors such as the current interest rate environment, how much money you invest, the length of time and the particular bank you choose. While nearly every bank offers CDs, the rates are rarely competitive, so it's important to shop around.

### Advantages of Investing in Certificate of Deposit

Since these are government-backed securities, the investor's principal amount is kept safe. Hence, it can be said that CDs are a less risky investment option than stocks or bonds.

Certificate of Deposit is known to offer a higher rate of interest and better returns in comparison to the traditional savings accounts.

### Commercial Paper

For many corporations, borrowing short-term money from banks is often a laborious and annoying task. The desire to avoid banks as much as possible has led to the widespread popularity of commercial paper. Unsecured promissory notes with a fixed maturity of one to 270 days; usually sold at a discount from face value.

Commercial paper is an unsecured, short-term loan issued by a corporation, typically for financing accounts receivable and inventories.

### History of Commercial Paper

Commercial paper was first introduced over 100 years ago when New York merchants began to sell their short-term obligations to dealers that acted as intermediaries. These dealers would purchase the notes at a discount from their par value and then pass them on to banks or other investors. The borrower would then repay the investor an amount equal to the par value of the note.

Marcus Goldman of Goldman Sachs was the first dealer in the money market to purchase commercial paper, and his company became one of the biggest commercial paper dealers in America following the Civil War. The Federal Reserve also began trading commercial paper along with Treasury bills from that time until World War II to raise or lower the level of monetary reserves circulating among banks. After the war, commercial paper began to be issued by a growing number of companies, and eventually, it became the premier debt instrument in the money market.

### Issuer and buyer of Commercial Paper

CPs are normally issued by:

- The bank
- Public utilities
- Insurance and finance companies

The buyers of CPs includes:

- Banking financial institutions
- Non-banking financial institutions.

### Advantage Commercial Paper

It is usually issued at a discount, reflecting current market interest rates. For the most part, commercial paper is a very safe investment because the financial situation of a company can easily be predicted over a few months. Furthermore, typically only companies with high credit ratings and credit worthiness issue commercial paper.

Commercial Paper Yield

$$\text{Yield} = (\text{Face value} - \text{Price}) / (\text{price} \times \text{no of days to maturity}) \times 365 \times 100$$



Commercial Paper Example

Particular	Amount
Face Value	5,00,000
Sale Price	4,90,000
Maturity Period	100

Brokerage and other charges 3%

$$\text{Brokerage} = 3\% \text{ of } 500,000 = 15,000$$

$$\text{Net Sale Price} = 490,000 - 15,000 = 475,000$$



Commercial Paper Example

Particular	Amount
Face Value	5,00,000
Sale Price	4,90,000
Maturity Period	100

Brokerage and other Charges 3%

Brokerage Value 15000

Net Sale Price 4,75,000

Yield 18.95%

### Repos

The repurchase agreement and the reverse repo agreement are two key tools used by many large financial institutions, banks, and some businesses. These short-term agreements provide temporary lending opportunities that help to fund ongoing operations. The Central Bank also uses the repo and RRP as a method to control the money supply.

**Repo**-It is short for repurchase agreement. Repurchase agreements, or repos, are a form of short-term borrowing used in the money markets, which involve the purchase of securities with the agreement to sell them back at a specific date, usually for a higher price.

**Reverse Repo** - The reverse repo is the complete opposite of a repo. In this case, a dealer buys government securities from an investor and then sells them back at a later date for a higher price.

**Term Repo** – It is exactly the same as a repo except the term of the loan is greater than 30 days.

#### How does repo rate affect the economy?

Using these two rates, the Central bank sets the tone for all other interest rates in the banking system, and through that route, in the broader economy. For instance, when the Central bank wants to encourage economic activity in the economy, it reduces the repo rates. Doing this enables commercial banks to bring down the interest rates they charge (on their loans) as well as the interest rate they pay on deposits. This, in turn, incentivizes people to spend money, because keeping their savings in the bank now pays back a little less, and businesses are incentivized to take new loans for new investments because new loans now cost a little less as well.

It is for this reason that the repo and reverse repo rates are often referred to as the “benchmark” interest rates in the economy.

#### Bills Rediscounting

A rediscount occurs when a short-term negotiable debt instrument is discounted for a second time. The reason an issuer would do this is to spark demand for loans when investor interest dries up. When liquidity in the market is low, banks can thus try to raise capital by rediscounting.

A rediscount is also a method for commercial banks to obtain financing from a central bank.



#### Example of Rediscounting

Imagine that a customer that borrows \$10,000 from a bank signs a promissory note stating that it will repay the bank \$12,500 after a year. This note is discounted by the bank, which subsequently lends out less than the \$12,500 face value of the note. The difference of value is the money earned by the bank for the loan.

If a bank wanted to obtain financing from the Central bank, it could rediscount this eligible note at the Central bank discount window for, say, \$11,500. In so doing, the central bank would take ownership of the loan note and provide the member bank with funds against the amount the note promises to pay at maturity. A central bank would rediscount a note for a commercial bank to assist them with current liquidity constraints, which can be attributed to a variety of factors, including seasonality. A central bank would also rediscount a note for banks that are low on customer deposits, which also creates liquidity issues.

#### Call Money

It is a segment of the market where scheduled commercial banks lend or borrow on short notice (say a period of 14 days). In order to manage day-to-day cash flows. The interest rates in the market are market-driven and hence highly sensitive to demand and supply. Also, the interest rates have been known to fluctuate by a large % at certain times.

#### Advantages and Disadvantages of Call Money

Call money is an important component of the money markets. It has several special features, as an extremely short period funds management vehicle, as an easily reversible transaction, and as a means to manage the balance sheet. Dealing in call money allows banks the opportunity to earn interest on surplus funds. The transaction cost is low, in that it is done bank-to-bank without the use of a broker. It helps to smooth the fluctuations and contributes to the maintenance of proper liquidity and reserves, as required by banking regulations.

### 16.3 Euro Currency Market-Introduction

The Eurocurrency market is the money market for currency outside of the country where it is legal tender. For example, a deposit of US dollars held in a bank in London, would be considered Eurocurrency, as the US dollar is deposited outside of its home market.

The Euro- prefix does not refer exclusively to the "euro" currency or the "Eurozone", as the term predates the creation of the euro. Instead, it can be applied to any combination of deposits in a foreign bank outside of its home market e.g. a deposit denominated in Japanese yen held in a Swiss bank is a Euroyen deposit. This market is the largest market in the international monetary system. It has been playing a central role in short and medium term international borrowing and lending by large corporations and banks and for financing international trade.

Eurocurrency is used for short-to-medium term financing by banks, multinational corporations, mutual funds, and hedge funds. Eurocurrency is generally seen as an attractive source of global funding due to its ease of convertibility between currencies as well as typically lower regulatory measures compared to sources of funding in domestic markets.

### **Understanding the Eurocurrency Market**

The origin of the Euro-currency market can be traced back to the 1920s when the US dollars were deposited in the European banks which converted them into their local currencies for lending purposes. But the real growth of the Euro-currency market began after the Second World War. The eurocurrency market originated in the aftermath of World War II when the Marshall Plan to rebuild Europe sent a flood of dollars overseas.

The market developed first in London, as banks needed a market for dollar deposits outside the United States. Dollars held outside the United States are called Eurodollars, even if they are held in markets outside Europe, such as Singapore or the Cayman Islands.

The Eurocurrency market has expanded to include other currencies, such as the Japanese yen and the British pound, whenever they trade outside of their home markets. However, the Eurodollar market remains the largest. There is not necessarily any connection between Eurocurrency markets and Europe today, although these markets did begin in Europe.

Interest rates paid on deposits in the Eurocurrency market are typically higher than in the domestic market. That is because the depositor is not protected by the same national banking laws and does not have governmental deposit insurance. Rates on Eurocurrency loans are typically lower than those in the domestic market for essentially the same reasons. Eurocurrency bank accounts are also not subject to the same reserve requirements as domestic accounts.

### **Growth of Euro Currency Market**

The following factors led to its growth:

**Flow of US Aid:** The United States emerged as the most powerful nation in the post-war period which spent huge sums of money on the rehabilitation of Europe both in terms of economic and military aid. This led to the transfer of a large number of dollars in Euro-banks.

**Cold War:** The cold war which started in the 1950s led the Soviet Union and the East European government to transfer their dollar deposits from America to Euro-banks for fear that they might be blocked by the American Government.

**Decline in the Importance of Sterling:** In the post-war period Britain emerged as a debtor country. Consequently, the British sterling which had dominated the international financial market in the pre-war era gave place to the dollar in the post-war period.

The importance of sterling further fell when the British Government placed severe restrictions on the grant of sterling to central banks outside the sterling area under the British Exchange Control Act in the early post-war period.

**Regulation-Q:** Regulation-Q of the US Federal Reserve System had been a major factor which gave rise to the Euro-currency market in the late 1960s. Under Regulation-Q, a ceiling was imposed on the interest rate payable on time deposits with the US banks and it prohibited the payment of any interest at all on deposits up to 30 days.

This encouraged the US banks to open branches in Europe and attract dollar deposits to be used for financing international trade. In particular, this happened in 1968 and 1969 and again from 1979 onwards when the Regulation-Q ceiling kept low interest rates on time deposits.

Consequently, both the US citizens and foreigners having dollars in excess of their transactions requirements transferred them in Euro-banks because they paid higher interest rate than the US banks.



**BOP Deficits in US:** There have been large and persistent BOP deficits in the US thereby leading to the outflow of the US dollars to the Euro-banks in countries having surplus with it.

**Petro-dollars:** The increase in the oil prices since 1973 has resulted in the tremendous increase in the incomes of the oil producing countries of the world which are known as petro-dollars. These are deposited in Euro-banks. These have further expanded the Euro-currency market.

### Features of Euro-Currency Market

The Euro-currency market has the following features:

#### 1. International Market:

The Euro-currency market is an international market which accepts deposits and gives credit in currencies from throughout the world.

#### 2. Independent Market:

It is a free and independent market which does not function under the control of any monetary authority.

#### 3. Wholesale Market:

It is a wholesale market in which different currencies are bought and sold usually above \$ 1 million.

#### 4. Competitive Market:

It is a highly competitive market in which the supply and demand for currencies depends on interest rate changes of Euro-banks.

#### 5. Short-Term Market:

It is a short-term money market in which deposits in different currencies are usually accepted for a period ranging from a few days to a year and interest is paid on them.

#### 6. Inter-Bank Market:

It is an inter-bank market in which the Euro-banks borrow and lend dollars and other Euro-currencies from each other.

### Role of Euro Currency Market in International Financial System

The Euro-currency market has been playing an important role in international financial system. Investing and borrowing US dollars is the core function of the Euro-currency market. It transfers short and medium terms funds throughout the world, thereby increasing international capital mobility. It not only enables individual banks to improve their portfolio allocation, but also provides important services to the non-bank private sector.

The Euro-currency market attracts funds because it offers higher interest rates, greater flexibility of maturities, and a wider range of investment qualities than other short-term capital markets. It attracts borrowers because it lends funds at relatively low interest rates.

It is competitive in the interest rates it charges and receives, both because of the economies of scale afforded by concentrating on wholesale transactions, and because the Euro-banks are not subject to the regulations which tend to raise costs in domestic banking.

#### Positive Effects:

The following have been the economic consequences of the Euro-currency market:

1. The expansion of the Euro-currency market has greatly increased international capital mobility and has helped in easing the global liquidity problem.
2. It has helped in integrating international capital markets.
3. It has played an effective role in recycling funds from countries having surplus balance of payments to those having deficit balance of payments.
4. International flows of Euro-currencies have improved economic efficiency by reducing interest differential among nations.

5. The Euro-currency market has also resolved the problems of countries whose policy objectives aim at controlling international capital movements by transferring their currencies from and to Euro-banks.

6. It has helped in financing BOP deficits and surpluses of countries through lending and borrowing their currencies in exchange for other currencies from the Euro-currency market.

#### **Adverse Effects:**

However, these flows of Euro-currencies have three adverse effects:

First, when the monetary authority of a country is trying to curb inflation through a restrictive monetary policy, an inflow of short-term capital defeats such a policy. Again when there is an outflow of capital and the country is following an easy monetary policy to combat unemployment, such a policy again becomes ineffective. This is because the Euro-currency market does not operate under the regulations of any authority.

Second, Euro-currencies provide an enormous fund of liquid resources which are used for speculative capital movements. These expose the economies of the concerned countries to severe strains of sudden and large withdrawals of credits. Such financial upheavals and disturbances also affect the international monetary system as a whole, especially when the countries involved are not protected by exchange controls or trade barriers.

Third, according to Milton Friedman, "The Euro-currency market has almost surely raised the world's nominal money supply (expressed in dollar equivalents) and has thus made the world price level (expressed in dollar equivalents) higher than otherwise it would be.

## **16.4 Forward Rate Agreements**

Forward rate agreements (FRA) are over-the-counter contracts between parties that determine the rate of interest to be paid on an agreed-upon date in the future. A borrower might want to fix their borrowing costs today by entering into an FRA.

In other words, an FRA is an agreement to exchange an interest rate commitment on a notional amount.

### **Forward Rate Agreement Meaning**

Forward Rate Agreement, popularly known as FRA, refers to customized financial contracts that are traded Over the Counter (OTC) and allow the counterparties, which are primarily large banks, corporate to predefine interest rates for contracts which are going to start at a future date.

There are two parties involved in a Forward Rate Agreement, namely the Buyer and Seller. The Buyer of such contract fixes in the borrowing rate at the inception of the contract, and the seller fixes in the lending rate. At the inception of an FRA, both parties have no profit/loss. However, as time passes, the Buyer of the FRA benefits if Interest Rates increases than the rate fixed at the inception, and the Seller Benefits if the interest rates fall than the rate fixed at the inception. In short, the Forward Rate Agreement is Zero-sum games where the gain of one is a loss for the other.

The FRA determines the rates to be used along with the termination date and notional value.

FRAs are cash-settled. The payment is based on the net difference between the interest rate of the contract and the floating rate in the market – the reference rate.

The notional amount is not exchanged. It is a cash amount based on the rate differentials and the notional value of the contract.

For example, if the Federal Reserve Bank is in the process of hiking U.S. interest rates, called a monetary tightening cycle, corporations would likely want to fix their borrowing costs before rates rise too dramatically.

Also, FRAs are very flexible, and the settlement dates can be tailored to the needs of those involved in the transaction.



### Forward Rate Agreements (FRA) Example

Axon International entered into a Forward Rate Agreement to receive a rate of 3.75% with continuous compounding on the principal of USD 1 Mio between the end of the first year and end of the Second year.

The current Zero rates for one year are 3.25%, and for two years, it is 3.50%.

This is basically a 1X2 FRA Contract.

Let's calculate the value of the Forward Rate Agreement in two scenarios:

At the beginning of the contract-

Thus we can see at the beginning of the Forward Rate Agreement, and there is no profit loss to any of the two parties.

Now let's assume the rate falls to 3.5%, let's compute the value of FRA again:

Thus we can see as interest rates move the value of FRA changes resulting in gain for one counterparty and equivalent loss to the other counterparty.



### Forward Rate Agreements (FRA) Example

Rand Bank entered into a Forward Rate Agreement on 20th Oct 2018 with Flexi Industries, whereby the Bank will pay a fixed interest of 10% and, in return, will receive a floating rate of interest-based on the Commercial Paper rate existing at the time of payment.

Payment is settled on a quarterly basis with the first payment due on 20th Jan 2019. Below are the details:

Thus Rand Bank will receive USD 2.32 Mio from Flexi Industries.

## The Use of FRA

A FRA can be used to hedge future interest rate exposure. The buyer hedges against the risk of rising interest rate whereas the seller hedges against the risk of falling interest rates. In other words, the buyer locks in the interest rate to protect against the increase of interest rates while the seller protects against the possible decrease of interest rates.

A speculator can also use FRAs to make bets on future directional changes in interest rates. Market participants can also take advantage of price differences between an FRA and other interest rate instruments.

## How to Calculate the FRA Payment?

The formula for the FRA payment takes into account five variables. They are:

FRA = the FRA rate

R = the reference rate

NP = the notional principal

P = the period, which is the number of days in the contract period

Y = the number of days in the year based on the correct day-count convention for the contract

Calculate the difference between the forward rate and the floating rate or reference rate.

Multiply the rate differential by the notional amount of the contract and by the number of days in the contract.

In the second part of the formula, divide the number of days in the contract by 360 and multiply the result by  $1 +$  the reference rate. Then divide the value into 1.

Multiply the result from the right side of the formula by the left side of the formula.

Assume the following data, and plugging it into the formula above:

FRA = 3.5%

R = 4%

NP = \$5 million

P = 181 days

Y = 360 days

$$(0.04 - 0.035) \times \$5 \text{ Million} \times 181/360 \times (1 + 0.04 \times 181/360) \\ = \$12,569.44 \times 0.980285 = \$12,321.64$$

If the payment amount is positive, the FRA seller pays this amount to the buyer. Otherwise, the buyer pays the seller. Remember, the day-count convention is typically 360 days in a year. Note also that the notional amount of \$5 million is not exchanged. Instead, the two companies involved in this transaction are using that figure to calculate the interest rate differential.

### **Advantages of Forwarding Rate Agreement (FRA)**

It enables the parties to such Agreement to reduce their risk of future borrowing and lending against any adverse movement by entering into such contracts.

For instance, a market participant who is scheduled to receive payment in Foreign currency at the end of one year can avoid the currency fluctuation risk by entering into a Forward Rate Agreement. Similarly, a bank which has borrowed funds at a fixed rate and expects the rates to decline in the future can benefit by such declined by entering into a Forward rate Agreement as a floating ratepayer. It is frequently used for trading based on interest rate expectations of market participants.

Forward Rate Agreements are derivative contracts that form part of the off-balance sheet and, as such, doesn't impact the balance sheet ratios.

### **Limitations of Forward Rate Agreements**

FRA is customized and traded over-the-counter and, as such carries, a higher amount of counterparty risk compared to a standardized futures contract, which is settled through a Qualified Centralized Counterparty (QCCP)

It is difficult to find a third counterparty to close the contract before maturity if the original contract is to be closed, and the initial counterparty is not ready to reverse the position.

### **Important Points**

The long position is effectively long the rates and benefits when rates increase. Similarly, the short position in a Forward Rate Agreement is effectively short the rates and benefits when rates decrease.

FRA is a notional contract, and as such, there is no exchange of principal at the expiry date.

FRA is similar to futures contracts, except they are known centrally cleared over-the-counter instruments, which can be customized by the parties between themselves for any maturity.

FRA is a linear derivative Instruments and derives its value directly from the underlying instrument.

#### **Conclusion**

Forward Rate Agreement has customized Interest rate contracts which are bilateral in nature and don't involve any centralized counterparty and frequently used by banks and corporate.

### **Euro Credits Meaning**

Euro credit refers to a loan whose denominated currency is not the lending bank's national currency. The concept is closely linked to that of Eurocurrency, which is any currency held or traded outside its country of issue. For example, a Eurodollar is a dollar deposit held or traded

## Unit 16: International Money Market

outside the U.S., and conversely, a euro credit loan made by a U.S. bank would be one that is not denominated in USD.

The "euro-" prefix in the term arose because originally such currencies were held, and loans made, in Europe, but that is no longer solely the case and a eurocurrency can now be held or a euro credit loan made anywhere in the world that local banking regulations permit.

A major part of the Euro debts is made in US dollars. The second is Pound Sterling followed by Deutsch mark, Japanese yen, Swiss franc and others.

### **How Euro credit Works**

The Eurocurrency market is a major source of finance for international trade because of ease of convertibility and the absence of domestic restrictions on trading. As the global financial system has deregulated and integrated over the past few decades, with many countries first dismantling capital controls and then opening up participation to foreign banks in their banking sectors, the euro credit market has been able to expand significantly.

Euro credit helps the flow of capital between countries and the financing of investments at home and abroad. A major function of banks is matching surplus units (who deposit at the bank) with deficit units (who borrow from the bank). Being able to do this internationally, both across borders and across currencies improves both liquidity and efficiency in the markets for financing.

Banks may also engage in syndicated loans in the euro credit market, where a loan is made by a group (syndicate) of banks. Syndicated loans reduce the risk of borrower default for each individual bank loaning funds and are often found where the size of the loan is too big for one bank to do by itself. Often, the banks in a syndicate will be headquartered in different countries but lending in one currency—an example of how the euro credit market can work to improve the flow of funds internationally.

Most of the syndicated debts are of the order of \$50 million. As far as the upper limits are concerned, amounts involved are of as high magnitude as \$5 billion and more. On an average, maturity periods are of about five years (in some cases it is about 20 years). The reimbursement of the loan may take place in one go (bullet) or in several installments.

The interest rate on Euro debt is calculated with respect to a rate of reference, increased by a margin. The rates are available and generally renewable every six months, fixed with reference to LIBOR.

The LIBOR is the rate of money market applicable to short-term credits among the banks of London. The reference rate can equally be PIBOR at Paris and FIBOR at Frankfurt, etc. The margin depends on the supply and demand of the capital as also on the degree of the risk of these credits and the rating of borrowers. There is an active secondary market of Euro debts.

### **Summary**

International money market deals in moving surplus funds to area where it is required for short period of time. The interest rate in money market is sensitive and depends on demand and supply. It also helps in monetary policy. There are various instruments like Treasury bill, certificate of deposit, commercial papers.

The Eurocurrency market is the money market for currency outside of the country where it is legal tender. It is the largest market in the international monetary system which is playing a central role in international borrowing and lending by large corporations and banks and for financing international trade.

Forward Rate Agreement known are customized financial contracts that are traded over the counter and allow the counterparties, which are primarily large banks, corporate to predefine interest rates for contracts which are going to start at a future date.

### **Keywords**

Commercial Paper: These are unsecured, short-term loan issued by companies for financing accounts receivable and inventories.

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**Forward Rate Agreement:** It refers to customized financial contracts which allow the counterparties, which are primarily large banks, corporate to predefine interest rates for contracts which are going to start at a future date.

**Reverse repo:** The reverse repo is the complete opposite of a repo. In this a dealer buys government securities from an investor and then sells them back at a later date for a higher price.

**Euro credit:** It refers to a loan whose denominated currency is not the lending bank's national currency.

**Certificate of Deposit:** It is money market instrument issued against the funds deposited by an investor with a bank.

**Treasury bill:** It is short-term debt obligations of a national government that are issued to mature in three to twelve months.

### Self Assessment

1. Money market deals in ----- requirement of funds.
  - A. Short Term
  - B. Long Term
  - C. Both of the above
  - D. Not Applicable
  
2. T-bills are the most marketable money market security. It is -----debt obligations of a national government.
  - A. Short-term
  - B. Long-term
  - C. Both of the above
  - D. Not Applicable
  
3. ----- is the safest instrument among.
  - A. Commercial Paper
  - B. Certificate of deposit
  - C. T-bills
  - D. None of the above
  
4. T-bills are purchased for a price that is issued at ----- .
  - A. Premium
  - B. Discount
  - C. Depends on market
  - D. None of the above
  
5. -----involve the purchase of securities with the agreement to sell them back at a specific date, usually for a higher price.
  - A. Bill discounting
  - B. Reverse Repo
  - C. Repo
  - D. None of the above

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6. ----- is an unsecured, short-term loan issued by a corporation, typically for financing accounts receivable and inventories.
- A. T-bills
  - B. Certificate of deposit
  - C. Commercial Paper
  - D. None of the above
7. When the Central bank wants to encourage economic activity in the economy, it ----- the repo rates.
- A. Reduces
  - B. Increases
  - C. Do nothing
  - D. None of the above
8. Dollars held outside the United States are called-----..
- A. Eurodollars
  - B. Euro bonds
  - C. Bill discounting
  - D. None of the above
9. ----- are over-the-counter contracts between parties that determine the rate of interest to be paid on an agreed-upon date in the future.
- A. Euro dollar
  - B. Bill discounting
  - C. Forward rate agreements
  - D. Not Applicable
10. FRA is customized and traded over-the-counter and, as such carries, a higher amount of counterparty risk.
- A. Customized
  - B. Standardized
  - C. Neither both of above
  - D. Not Applicable
11. FRA enables the parties to -----their risk of future borrowing and lending against any adverse movement by entering into such contracts.
- A. Reduce
  - B. Increase
  - C. Neither of the above
  - D. Not Applicable
12. The money market is different from the capital market, which is concerned with medium- and long-term credit.
- A. True

B. False

13. Money Market makes it easier for investors to dispose of their surplus funds, retaining their liquid nature, and earn significant profits on the same.

A. True

B. False

14. The international money market sees very large funds transfer. The international money market investments are less risky and consequently, the returns obtained from the investments are less too.

A. True

B. False

15. EUR/USD tracks the exchange rate between euros and U.S. dollars, GBP/USD indicates trade between British pounds and U.S. dollars, and USD/JPY refers to the exchange of U.S. dollars for Japanese yens.

A. True

B. False

### **Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. A  | 3. C  | 4. B  | 5. C  |
| 6. C  | 7. A  | 8. A  | 9. C  | 10. A |
| 11. A | 12. A | 13. A | 14. A | 15. A |

### **Review Questions**

- 1) What do you mean by Money market?
- 2) Enumerate the various instruments in money market.
- 3) Elaborate the concept and use of Forward rate agreement.
- 4) How Euro credit works in the market?



### **Further Readings**

Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

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### **Web Links**

- <https://scripbox.com/mf/money-market-instruments/>
- <https://corporatefinanceinstitute.com/resources/knowledge/finance/eurocurrency/>
- [https://en.wikipedia.org/wiki/Forward\\_rate\\_agreement](https://en.wikipedia.org/wiki/Forward_rate_agreement)
- <https://www.investopedia.com/terms/e/eurocredit.asp>





## Unit 17: Market Efficiency and Behavioral Finance

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17.4 Summary of Tests of the EMH

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### Objective

- Understand meaning and forms of market efficiency.
- Implications of different forms of market efficiency..
- Interpret evidences of anomalies in different forms of market efficiency.

### Introduction

Some of the most interesting and important academic researches during the past 20 years have analyzed whether our capital markets are efficient or not. This extensive research is important because its results have significant real-world implications for investors and portfolio managers.

In addition, the question of whether capital markets are efficient is one of the most controversial areas in investment research. Recently, a new dimension has been added to the controversy because of the rapidly expanding research in behavioral finance that likewise has major implications regarding the concept of efficient capital markets.

Meanwhile, while academics point to a large body of evidence in support of EMH, an equal amount of dissension also exists.

For example, investors, such as Warren Buffett have consistently beaten the market over long periods of time, which by definition is impossible according to the EMH.

Detractors of the EMH also point to events, such as the 1987 stock market crash when the Dow Jones Industrial Average (DJIA) fell by over 20% in a single day, as evidence that stock prices can seriously deviate from their fair values. An efficient capital market is one in which security prices adjust rapidly to the arrival of new information and, therefore, the current prices of securities reflect all information about the security.

### **17.1 Efficient Market**

An "efficient" market is defined as a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities.

Where important current information is almost freely available to all participants ... on the average, competition will cause the full effects of new information on intrinsic values to be reflected "instantaneously" in actual prices.

Meanwhile, while academics point to a large body of evidence in support of EMH, an equal amount of dissension also exists.



For example, investors, such as Warren Buffett have consistently beaten the market over long periods of time, which by definition is impossible according to the EMH.

Detractors of the EMH also point to events, such as the 1987 stock market crash when the Dow Jones Industrial Average (DJIA) fell by over 20% in a single day, as evidence that stock prices can seriously deviate from their fair values.

### **History of the Random-Walk Theory**

Successive stock prices are independent and they do not follow any regular pattern.

French mathematician, Louis Bachelier in 1900 wrote a paper suggesting that security price fluctuations were random. In 1953, Maurice Kendall in his paper reported that stock price series is a wandering one. Each successive change is independent of the previous one. In 1970, Fama stated that efficient markets fully reflect the available information.

Random walk is a stock market theory that states that the past movement or direction of the price of a stock or overall market cannot be used to predict its future movement.

Originally examined by Maurice Kendall in 1953, the theory states that stock price fluctuations are independent of each other and have the same probability distribution, but that over a period of time, prices maintain an upward trend.

In short, random walk says that stocks take a random and unpredictable path. The chance of a stock's future price going up is the same as it going down. A follower of random walk believes it is impossible to outperform the market without assuming additional risk. In his book, Maurice preaches that both technical and fundamental analysis are largely a waste of time and are still unproven in outperforming the markets.

#### **Key Arguments for Random Walk Theory**

Information is freely and instantaneously to all the market participants.

The market will fully impound all available information.

Price changes only in response to new information.

Since new information cannot be predicted in advance, so price changes cannot be forecasted.

Hence prices behave like a random walk.

## **17.2 Efficient Market Theory**

Efficient market theory states that the share price fluctuations are random and do not follow any regular pattern. The expectations of the investors regarding the future cash flows are translated or reflected on the share prices.

The accuracy and the quickness in which the market translates the expectation into prices are termed as market efficiency.

### **Two Types of Market Efficiencies**

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**Operational efficiency:** Operational efficiency is measured by factors like time taken to execute the order and the number of bad deliveries. Efficient market hypothesis does not deal with this efficiency.

**Informational efficiency:** It is a measure of the swiftness or the market's reaction to new information.

New information in the form of economic reports, company analysis, political statements and announcement of new industrial policy is received by the market frequently. Security prices adjust themselves very rapidly and accurately.



### Caselet-Market Efficiency: Implications

Economist Dick Thaler said quite nice things about "The Myth of the Rational Market."

In it, he makes the case that the efficient market hypothesis consists of two main ideas, "No Free Lunch" and "The Price is Right," that have met very different fates over the past decade or so. After running through the history, he concludes:

What lessons should we draw from this?

On the free lunch component there are two. The first is that many investments have risks that are more correlated than they appear. The second is that high returns based on high leverage may be a mirage.

On the price is right, if we include the earlier bubble in Japanese real estate, we have now had three enormous price distortions in recent memory. They led to misallocations of resources measured in the trillions and, in the latest bubble, a global credit meltdown. If asset prices could be relied upon to always be "right", then these bubbles would not occur. But they have, so what are we to do?

While imperfect, financial markets are still the best way to allocate capital. Even so, knowing that prices can be wrong suggests that governments could usefully adopt automatic stabilizing activity, such as linking the down-payment for mortgages to a measure of real estate frothiness or ensuring that bank reserve requirements are set dynamically according to market conditions. After all, the market price is not always right.

Do you agree with Thaler's Ideas? Why/why not?

Do you think that financial markets are still the best way to allocate capital. Why/ why not?

## 17.3 Forms of Efficiencies

Eugene Fama developed a framework of market efficiency that laid out three forms of efficiency: weak, semi-strong, and strong. Each form is defined with respect to the available information that is reflected in prices.

- Weak form
- Semi-strong form
- Strong form

### Forms of Efficiencies

The level of information being considered in the market is the basis for this segregation.

**Weak form**

**Semi-strong form**

**Strong form**

#### **Weak Form of EMH**

Current prices reflect all information found in the past prices and volumes. This means that there is no relationship between past and future price movements. Buying and selling activities of the information traders lead the market price to align with the intrinsic value. Because it assumes that current market prices already reflect all past returns and any other security market information, this hypothesis implies that past rates of return and other historical market data should have no relationship with future rates of return (that is, rates of return should be independent).

This threw cold water on the practice of technical analysis – the study of stock price charts to divine future price movements. Technical Analysts search for recurrent and predictable patterns in stock prices, so that an investor can ride that pattern and make a profit out of it.

Therefore, this hypothesis contends that you should gain little from using any trading rule that decides whether to buy or sell a security based on past rates of return or any other past market data.

Most research supports the notion that the markets are weak form efficient.

#### **Semi-Strong Form**

The security price adjusts rapidly to all publicly available information. The prices not only reflect the past price data, but also the available information regarding the earnings of the corporate, dividend, bonus issue, right issue, mergers, acquisitions and so on.

The semi-strong form, if correct, repudiates fundamental analysis. Fundamental analysis uses earnings and dividend prospects of firms, expectations of future interest rates and risk evaluation of firm to determine proper stock prices. Ultimately it represents an attempt to determine the present discounted value of all payments a stockholder will receive from each share of stock.

Discovery of good firms does no good to an investor if the rest of the market also knows those firms are good. Then there will be no abnormal returns. The trick is to find undervalued stocks before the market does. Poor performance firms can be great bargains if they are not as bad as the market thinks they are.

#### **Strong Form**

All information is fully reflected on security prices. It represents an extreme hypothesis which most observers do not expect it to be literally true.

Even the knowledge of material, non-public information cannot be used to earn superior results. Most studies have found that the markets are not efficient in this sense.

## 17.4 Summary of Tests of the EMH

### Weak form Hypothesis

Current prices reflect all information found in the past prices and volumes. This means that there is no relationship between past and future price movements.

What does this mean?

Technical Analysis is useless.

Past stock price data is publicly available and virtually cost less to obtain.

All the information generated by technical analysis has already been incorporated into the price. So a signal has lost its value.



### Real World Example of Weak Form Efficiency

Suppose David, a swing trader, sees Alphabet Inc. (GOOGL) continuously decline on Mondays and increase in value on Fridays. He may assume he can profit if he buys the stock at the beginning of the week and sells at the end of the week. If, however, Alphabet's price declines on Monday but does not increase on Friday, the market is considered weak form efficient.

Similarly, let's assume Apple Inc. (APPL) has beaten analysts' earnings expectation in the third quarter consecutively for the last five years.

Jenny, a buy-and-hold investor, notices this pattern and purchases the stock a week before it reports this year's third quarter earnings in anticipation of Apple's share price rising after the release. Unfortunately for Jenny, the company's earnings fall short of analysts' expectations. The theory states that the market is weakly efficient because it doesn't allow Jenny to earn an excess return by selecting the stock based on historical earnings data.

### Testing the Weak Form of Market Efficiency

This hypothesis confirms that changes in stock price in the future are independent of the changes that happened in the past (random walk of prices). Therefore, the investor cannot earn an abnormal income on his trading based on past price movements.

### Run test

What is a run?

An uninterrupted sequence of same price changes.

(++,\_ \_00) would be three runs.

- An increase in price is represented by +
- The decrease in price is represented by -
- When there is no change in price, it is represented by zero.

A consecutive sequence of some sign is considered as run changes of sign indicates new run.

$Z = \frac{R - X}{S.d.}$  Calculated value > table value = no significant difference are found, then the security price changes are considered to be random in nature.

### Serial correlation

Is the price change in one period is correlated with the price change in some other period?

Serial correlation or auto-correlation studies find the correlation co-efficient in a series of numbers by employing different stocks, different time periods. Many studies conducted on the security price changes have failed to show any significant correlations.

### Filter rule

A filter rule is a trading strategy based on pre-determined price changes, typically quantified as a percentage.

The trader determines the price change they want to use based on analyzing charts and determining which percentage works best for what they are trying to accomplish. For example, a technical trader may notice that once the price rises 5% from a particular level, it tends to move another 10% in that same direction. Therefore, the trader could take advantage of this by using a filter rule and watching for stocks (or any asset for which the rule is beneficial) that move 5% off a prior closing price, low, or high.

The trader must also determine what the price change is based on, such as closing prices, a move above a high or low, or some other important technical price level.

According to this strategy if a price of a security rises by at least  $x$  per cent, investor should buy and hold the stock until its price declines by at least  $x$  per cent from a subsequent high. The behavior of the stock price changes is random, filter rules should not outperform a simple buy and hold strategy.

## **17.5 Anomalies**

Literary meaning of an anomaly is a strange or unusual occurrence.

While in standard finance theory, financial market anomaly means a situation in which a performance of stock or a group of stocks deviate from the assumptions of efficient market hypotheses.

Such movements or events which cannot be explained by using efficient market hypothesis are called financial market anomalies.

### **Evidences of anomalies in WFH**

Calendar and time anomalies contradict the weak form efficiency because weak form efficiency postulates that markets are efficient in past prices and cannot predict future on these bases.

But existence of seasonality and monthly effects contradict market efficiency and in this case investors can earn abnormal return. The Calendar anomalies that they considered in their studies are weekend effect, turn-of-the-month effect, turn-of-the-year effect January effect and end-of-December effect.

**Weekend effect:** The stock prices are likely to fall on Monday. Means the closing price of Monday is less than the closing price of previous Friday.

**Turn-of-the-month effect:** The prices of stocks are likely to increase in the last trading day of the following month, and the first three days of next month.

**Turn-of-the-Year Effect:** This anomaly describes the increase in the prices of stocks and trading volume of stock exchange in the last week of December and the first half month of January.

**January Effect:** The phenomenon of small-company stocks to generate more return than other asset classes and market in the first two to three weeks of January is called January effect.

**Moving Averages:** An important technique of technical analysis in which buying and selling signals of stocks are generated by long period averages and short period averages. In this strategy buying stocks when short period averages raises over long period averages and selling the stocks when short period averages falls below the long period averages.

**Trading Range Break:** This technique of technical analysis is based upon resistance and support level.

A buy signal is created when the prices reaches at resistance level, which is local maximum. As investor wants to sell at peak, this selling pressure causes the resistance level to breakout than previous level. This breaks out causes a buy signal.

A selling signal is created when prices reaches the support level which is minimum price level. Thus technical analysis recommends buying when the prices raises above last peak and selling when prices falls below last trough. But this strategy is difficult to implement.

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Many researchers have found that when the market holds weak form efficiency, then prices already reflected the past information and technical analysis is of no use.

So the investor cannot beat the market by earning abnormal returns on the basis of technical analysis and past information. But here are some anomalies that deviate from the findings of these studies.

### **Semi-strong form hypothesis**

The semi-strong form efficiency theory follows the belief that because all information that is public is used in the calculation of a stock's current price, investors cannot utilize either technical or fundamental analysis to gain higher returns in the market.

Those who subscribe to this version of the theory believe that only information that is not readily available to the public can help investors boost their returns to a performance level above that of the general market.

### **Testing the Semi-strong**

Event Studies: Steps in Event Studies

Step 1: Identify the event

- Pinpoint the announcement date
- Markets react to the announcement of an event rather than the event itself

Step 2: Collect returns data around the announcement date

Step 3: Calculate the abnormal return

$$\text{Abnormal return} = R_i - E(R_i)$$

- Calculate the Average Abnormal return for each company for each trading period
- Calculate the Cumulative Average Abnormal return (CAAR)
- $CAAR = \sum (\text{Average Abnormal returns for all companies})$

If the value of CAAR is close to zero it can be concluded that markets are efficient in the semi strong form.

There are anomalies that the efficient market theory cannot explain and that may even flatly contradict the theory.

For example, the price/earnings (P/E) ratio shows that firms trading at lower P/E multiples are often responsible for generating higher returns.

The neglected firm effect suggests that companies that are not covered extensively by market analysts.

These are sometimes priced incorrectly in relation to their true value and offer investors the opportunity to pick stocks with hidden potential.

Value anomaly occurs due to false prediction of investors. They overly estimate the future earnings and returns of growth companies and underestimate the future returns and earnings of value companies.

Stocks with high dividend yield outperform the market and generate more return. If the yield is high, then the stock generates more return.

A firm may 'split' its shares by increasing the number of shares of common stock and reducing the par or stated value per share in the proportion. No new money is raised and cash flow are unchanged therefore prices should not react purely to stock split.

To test market efficiency specific investment strategies are examined to see whether they earn excess return by using CAPM, APT or some other model.



Most of the price reaction is completed immediately after earnings are announced. There is little delay in the reaction, so there is little opportunity to earn abnormal returns from the market systematically erring in its response to the announcement.

### **Strong Form**

The strong form version of the efficient market hypothesis states that all information—both the information available to the public and any information not publicly known—is completely accounted for in current stock prices, and there is no type of information that can give an investor an advantage on the market.

Advocates for this degree of the theory suggest that investors cannot make returns on investments that exceed normal market returns, regardless of information retrieved or research conducted.

### **Evidences of Anomalies in Strong Form**

All information is fully reflected on security prices.

To test the strong form efficient market hypothesis, researchers analyzed the returns earned by certain groups like corporate insiders, specialists on stock exchange and mutual fund managers.

Fama acknowledged that strong market efficiency could not be an entirely realistic model for the markets, since certain nonpublic information clearly pre-sented a profit op-por-tu-nity for those who pos-sessed it.

### **Reality of Markets**

### **Markets are dynamic entity, equilibrium in the long run is a foreign concept**

Relationship between Risk & Return is unstable Is guided by investor preferences and regulatory environment. Like the environment of Low Interest Rates in 2001-2007 may have fuelled the mortgage bubble.

### **The relationship between Risk & Reward is not as quantitative as EMH assumes**

Even a large no of so called intelligent analysts could not gauge the risk in-CDO Securities in the US, risk in Sectoral Funds - In India, risk in Zero Cost Options - In India

### **Equity Risk premium is time and path dependent**

### **Arbitrage opportunities exist from time to time**

They disappear but only after long period of time - Pair Trading, Bond Spreads, Value Arbitrage

### **Bubbles, Cycles, Trends, Crashes, Manias all are part of market**

Even with passage of time, they won't be driven away as EMH assumed

Investment activities will be able to generate super returns but not forever, innovation is the key

One needs to adapt to the change in market inefficiencies, behavior, trading environment etc.

### **But said that for most of the investors, it's difficult to generate super-normal returns**

As it's not easy to identify and also act upon profitable opportunities before they are common.

### **Current Status of EMH**

- Not the Singular God anymore
- Behavioral Finance especially post 2007-Crisis is gaining momentum
- Still hotly debated
- Move towards assimilation With acceptance of low probability of outperformance

### **Implications For Investments**

Substantial evidence in favours of randomness suggests that technical analysis is of dubious value.

Routine and conventional fundamental analysis is not of much help in identifying profitable courses of action still held out hope for fundamental analysts.

## Implications For Investments

**The key levers for earning superior rates of returns are:**

- Early action on any new development.
- Sensitivity to market imperfections and anomalies.
- Use of original, unconventional, and innovative modes of analysis.
- Access to inside information and its sensible interpretation.
- An independent judgment that is not affected by market psychology.

**Conclusion**

There is evidence that markets are weak form and semi- strong form efficient, but probably not strong form efficient,

Finally, it should be noted that there is some evidence that contradicts the hypothesis.

The efficient market hypothesis has not been “proven,” however, it is a highly regarded tenant in modern finance. If markets are efficient, investors can expect that prices are “fair,” and that the rate of return earned from a diversified portfolio of securities over time will be approximately average for that class of securities.

**Summary**

Markets are efficient or not is the subject of research. There are positives and negative which shows markets are not efficient.

Efficient markets reflect information instantly in prices. There are three forms of market efficiency which are weak form, semi strong forma and strong form.

However there are anomalies in every form of market which reflects that market are not efficient.

**Keywords**

Efficient Paper: Efficient market is a market where there are large numbers of rational, profit-maximizers actively competing, with each trying to predict future market values of individual securities.

Anomaly: It is a strange or unusual occurrence.

Random Walk theory: It states that successive stock prices are independent and they do not follow any regular pattern.

Weak form of EMH: It states current prices reflect all information found in the past prices and volumes

**Self Assessment**

1. EMH deals with which----- type of Efficiency.

- A. Operational efficiency
- B. Informational efficiency
- C. Both of the above
- D. Not Applicable

2. In strong form of efficient market-

- A. All available information is reflected in price

- B. All published available information is reflected in price
  - C. Both of the above
  - D. Not Applicable
3. In weak efficient market stock price reflects.
- A. All available information is reflected in price
  - B. All published available information is reflected in price
  - C. All past price is reflected in price
  - D. None of the above
4. In semi strong form of efficient market
- A. All available information is reflected in price
  - B. All published available information is reflected in price
  - C. All past price is reflected in price
  - D. None of the above
5. Weak effect, Monday effect, Hour of the day effect, January effect, Small firm effect, Bubbles are the empirical test or inefficiencies of ----- of EMH.
- A. Weak form
  - B. Semi strong form
  - C. Strong form
  - D. None of the above
6. Corporate insiders, specialists on stock exchange and mutual fund managers takes abnormal profit which is inefficiencies of ----- form of EMH..
- A. Weak form
  - B. Semi strong form
  - C. Strong form
  - D. None of the above
7. If the markets are efficient the security price provides
- A. Inadequate return for taking risk
  - B. Normal return for the level of risk
  - C. Abnormal return
  - D. None of the above
8. This of the following statement defines the efficient market
- A. Information is fully reflected in stock price
  - B. The stock exchange is fully automated
  - C. Free entry and exit in market
  - D. None of the above

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9. As per implications of the efficient market hypothesis are that technical analysis is can be -----  
----- for excess return and could be of
- A. Great help
  - B. No help
  - C. Less Help
  - D. Not Applicable
10. Run test is a test used for which form
- A. Weak form
  - B. Semi strong form
  - C. Strong form
  - D. None of the above
11. Filter test is a test used for which form
- A. Weak form
  - B. Semi strong form
  - C. Strong form
  - D. None of the above
12. Operational efficiency is measured by factors like time taken to execute the order and the number of bad deliveries
- A. True
  - B. False
13. Informational efficiency is a measure of the swiftness or the market's reaction to new information.
- A. True
  - B. False
- 14 Moving Averages is an important technique of technical analysis in which buying and selling signals of stocks are generated by long period averages and short period averages.
- A. True
  - B. False
15. Current prices reflect all information found in the past prices and volumes. This means that there is no relationship between past and future price movements.
- A. True
  - B. False

**Answers for Self Assessment**

1. A      2. A      3. C      4. B      5. B  
6. C      7. B      8. A      9. B      10. A

11. A            12. A            13. A            14. A            15. A

### **Review Questions**

- 1) What do you mean by efficient market?
- 2) Enumerate the various forms of efficient market hypothesis.
- 3) Explain the concept of anomaly.
- 4) Elaborate different anomalies in all forms of efficiency.



### **Further Readings**

Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.



### **Web Links**

- <https://www.investopedia.com/terms/m/marketefficiency.asp>
- <https://www.investopedia.com/ask/answers/032615/what-are-differences-between-weak-strong-and-semistrong-versions-efficient-market-hypothesis.asp>
- <https://www.investopedia.com/articles/financial-theory/11/trading-with-market->
- <https://pages.stern.nyu.edu/~adamodar/pdfiles/valn2ed/ch6.pdf>

## Unit 18: Investment Risk and Project Analysis

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### Objective

- Recognize different risk measures for evaluating risk.
- Interpret variance and semi variance for evaluating risk.
- Interpret various methods of analyzing risk.
- Applying concept for solving problems in risk measures.

### Introduction

Dictionary meaning of risk is probability of loss or Injury, the Degree or Probability of such loss. Risk means variability of return associated with investment. A risky situation is one which has some probability of loss. The higher the probability of loss, the greater the risk. The riskiness of an investment can be judged by describing the probability distribution of its possible returns. Risk is defined in financial terms as the chance that an outcome or investment's actual gains will differ from an expected outcome or return.

Risk is also influenced by external and internal considerations. External risks are uncontrollable and broadly affect the investments.

### 18.1 Quantification of Risk

Understanding Nature and type of risk is not sufficient unless quantification is done. Quantifiably, risk is usually assessed by considering historical behaviors and outcomes.

In finance, standard deviation is a common metric associated with risk. Standard deviation provides a measure of the volatility of asset prices in comparison to their historical averages in a given time frame. Overall, it is possible and prudent to manage investing risks by understanding the basics of risk and how it is measured. Learning the risks that can apply to different scenarios and some of the ways to manage them holistically will help all types of investors and business managers to avoid unnecessary and costly losses.

**Investment risk**

Investment risk can be defined as the probability or likelihood of occurrence of losses relative to the expected return on any particular investment. Stating simply, it is a measure of the level of uncertainty of achieving the returns as per the expectations of the investor.

Risk is an important component in assessment of the prospects of an investment. Most investors while making an investment consider less risk as favorable. The lesser the investment risk, more lucrative is the investment. However, the thumb rule is the higher the risk, the better the return.

**Types of Investment Risk**

**Market Risk**- The risk of investments declining in value because of economic developments or other events that affect the entire market. The main types of market risk are equity risk, interest rate risk, and currency risk.

**Equity Risk** - applies to an investment in shares. The market price of shares varies all the time depending on demand and supply. Equity risk is the risk of loss because of a drop in the market price of shares.

**Interest Rate Risk** - applies to debt investments such as bonds. It is the risk of losing money because of a change in the interest rate.



For example, if the interest rate goes up, the market value of bonds will drop.

**Currency Risk** - applies when you own foreign investments. It is the risk of losing money because of a movement in the exchange rate.



For example, if the U.S. dollar becomes less valuable relative to the Canadian dollar, your U.S. stocks will be worth less in Canadian dollars.

**Liquidity risk** - The risk of being unable to sell your investment at a fair price and get your money out when you want to. To sell the investment, you may need to accept a lower price. In some cases, such as exempt market investments, it may not be possible to sell the investment at all.

**Concentration risk** - The risk of loss because your money is concentrated in one investment or type of investment. When you diversify your investments, you spread the risk over different types of investments, industries and geographic locations.

**Credit risk** - The risk that the government entity or company that issued the bond will run into financial difficulties and won't be able to pay the interest or repay the principal at maturity. Credit risk applies to debt investments such as bonds. You can evaluate credit risk by looking at the credit rating of the bond.



For example, long-term Canadian government bonds have a credit rating of AAA, which indicates the lowest possible credit risk.

**Reinvestment Risk** - The risk of loss from reinvesting principal or income at a lower interest rate. Suppose you buy a bond paying 5%. Reinvestment risk will affect you if interest rates drop and you have to reinvest the regular interest payments at 4%. Reinvestment risk will also apply if the bond matures and you have to reinvest the principal at less than 5%.

**Inflation Risk** - The risk of a loss in your purchasing power because the value of your investments does not keep up with inflation. Inflation erodes the purchasing power of money over time - the same amount of money will buy fewer goods and services. Inflation risk is particularly relevant if you own cash or debt investments like bonds.

**Horizon Risk-** The risk that your investment horizon may be shortened because of an unforeseen event, for example, the loss of your job. This may force you to sell investments that you were expecting to hold for the long term. If you must sell at a time when the markets are down, you may lose money.

**Longevity Risk-** The risk of outliving your savings. This risk is particularly relevant for people who are retired, or are nearing retirement.

**Foreign Investment Risk-** The risk of loss when investing in foreign countries. When you buy foreign investments, for example, the shares of companies in emerging markets, you face risks that do not exist in Canada, for example, the risk of nationalization.

## 18.2 Quantification of Risk

Risk measures are statistical measures that are historical predictors of investment risk and volatility. Risk measures can be used individually or together to perform a risk assessment. When comparing two potential investments, it is wise to compare like for like to determine which investment holds the most risk.

The five principal risk measures include the alpha, beta, R-squared, standard deviation, and Sharpe ratio.

### Alpha

Alpha measures risk relative to the market or a selected benchmark index.



For example, if the S&P 500 has been deemed the benchmark for a particular fund, the activity of the fund would be compared to that experienced by the selected index. If the fund outperforms the benchmark, it is said to have a positive alpha. If the fund falls below the performance of the benchmark, it is considered to have a negative alpha.

### Beta

Beta measures the volatility or systemic risk of a fund in comparison to the market or the selected benchmark index.

A beta of one indicates the fund is expected to move in conjunction with the benchmark. Betas below one are considered less volatile than the benchmark, while those over one are considered more volatile than the benchmark.

### R-Squared

R-Squared measures the percentage of an investment's movement attributable to movements in its benchmark index. An R-squared value represents the correlation between the examined investment and its associated benchmark.



For example, an R-squared value of 95 would be considered to have a high correlation, while an R-squared value of 50 may be considered low. The U.S. Treasury Bill functions as a benchmark for fixed-income securities, while the S&P 500 Index functions as a benchmark for equities.

### Standard Deviation

Standard deviation is a method of measuring data dispersion in regards to the mean value of the dataset and provides a measurement regarding an investment's volatility. As it relates to investments, the standard deviation measures how much return on investment is deviating from the expected normal or average returns.

### Sharpe Ratio

The Sharpe ratio measures performance as adjusted by the associated risks. This is done by removing the rate of return on a risk-free investment, such as a U.S. Treasury Bond, from the experienced rate of return. This is then divided by the associated investment's standard deviation and serves as an indicator of whether an investment's return is due to wise investing or due to the assumption of excess risk.



### 18.3 Variance & Semi Variance

Variance is a measurement of the degree of risk in an investment. The variance is a measure of variability. Variance tells you the degree of spread in your data set. The more spread the data, the larger the variance is in relation to the mean.

The standard deviation is derived from variance and tells you, on average, how far each value lies from the mean. It's the square root of variance. Variance is neither good nor bad for investors in and of itself. However, high variance in a stock is associated with higher risk, along with a higher return. Low variance is associated with lower risk and a lower return. High-variance stocks tend to be good for aggressive investors, while low-variance stocks tend to be good for conservative investors who have less risk tolerance. However, according to modern portfolio theory (MPT), it is possible to reduce variance without compromising expected return by combining multiple asset types through asset allocation.

The term variance refers to a statistical measurement of the spread between numbers in a data set. More specifically, variance measures how far each number in the set is from the mean and thus from every other number in the set then squaring the differences to make them positive, and finally dividing the sum of the squares by the number of values in the data set.

Under this approach, an investor builds a diversified portfolio that includes not just stocks but asset types such as bonds, commodities, real estate investment trusts, or REITs, insurance products and derivatives. A diversified portfolio might also include cash or cash equivalents, foreign currency and venture capital, for example, variance is often depicted by this symbol:  $\sigma^2$ . It is used by both analysts and traders to determine volatility and market security.

The square root of the variance is the standard deviation ( $\sigma$ ), which helps determine the consistency of an investment's returns over a period of time. Variance is calculated by using the following formula:

$$\text{variance } \sigma^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}$$

Where  $x_i$  =  $x$ ith data point

$\bar{x}$  = Mean of all data points

$N$  = Number of data points

A large variance indicates that numbers in the set are far from the mean and far from each other. A small variance, on the other hand, indicates the opposite. A variance value of zero, though, indicates that all values within a set of numbers are identical. Every variance that isn't zero is a positive number. A variance cannot be negative. That's because it's mathematically impossible since you can't have a negative value resulting from a square.



#### Example of Variance

. Let's say returns for stock in Company ABC are 10% in Year 1, 20% in Year 2, and -15% in Year 3. The average of these three returns is 5%. The differences between each return and the average are 5%, 15%, and -20% for each consecutive year. Squaring these deviations yields 0.25%, 2.25%, and 4.00%, respectively. If we add these squared deviations, we get a total of 6.5%. When you divide the sum of 6.5% by one less the number of returns in the data set, as this is a sample ( $2 = 3-1$ ), it yields a variance of 3.25%. Taking the square root of the variance yields the standard deviation of 18% for the returns.

#### Use of Variance

Investors use variance to see how much risk an investment carries and whether it will be profitable. Variance is also used to compare the relative performance of each asset in a portfolio to achieve the best asset allocation.

#### Advantages and Disadvantages of Variance

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**Unit 18: Investment Risk and Project Analysis**


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The advantage of variance is that it treats all deviations from the mean as the same regardless of their direction. The squared deviations cannot sum to zero and give the appearance of no variability at all in the data. One drawback to variance, though, is that it gives added weight to outliers. These are the numbers far from the mean. Squaring these numbers can skew the data. Another pitfall of using variance is that it is not easily interpreted.

### Question

The return of X and Y under different market condition are given. Calculate expected return and standard deviation. Also give decision whether you want to invest in X and Y or in both?

Calculation of expected return

For X

	R	P	Sum r*p
Boon	25	.3	7.5
Normal	35	.5	17.5
Recession	45	.2	9
			34

Calculation of expected return

For Y

	R	P	Sum r*p
Boon	45	.3	13.5
Normal	35	.5	17.5
Recession	25	.2	5
			3

Calculation of Standard Deviation X is square root of  $\sum(R - \bar{R})^2 P$

So Standard deviation is square root of 49 = 7

Similarly Standard deviation of Y = 7

So both the stocks have same risk but return is y is 36 more than so y is preferable.

### Semi Variance

Semi variance is a measurement of data that can be used to estimate the potential downside risk of an investment portfolio. Semi-deviation will reveal the worst-case performance to be expected from a risky investment. Semi variance is calculated by measuring the dispersion of all observations that fall below the mean or target value of a set of data. Semi variance is an average of the squared deviations of values that are less than the mean.

#### History of Semi Variance

Downside risk was first modeled by Roy (1952), who assumed that an investor's goal was to minimize his/her risk. This mean-semi variance, or downside risk, model is also known as "safety-first" technique, and only looks at the lower standard deviations of expected returns which are the potential losses.

This is about the same time Harry Markowitz was developing mean-variance theory. Even Markowitz, himself, stated that "semi-variance is the more plausible measure of risk" than his mean-variance theory. Then, through a theoretical analysis of capital market values, Hogan and Warren demonstrated that 'the fundamental structure of the "capital-asset pricing model is retained when standard semi deviation is substituted for standard deviation to measure portfolio risk."

This shows that the CAPM can be modified by incorporating downside beta, which measures downside risk, in place of regular beta to correctly reflect what people perceive as risk. Since the early 1980s, when Dr. Frank Sortino developed formal definition of downside risk as a better measure of investment risk than standard deviation, downside risk has become the industry standard for risk management.

The Formula for Semi variance Is

$$\text{Semi variance} = \frac{1}{n} \times \sum_{i=1}^n (\text{Average} - r_t)^2$$

Where:

$n$  = The total number of observations below the mean

$r_t$  = The observed value

Average = the mean or target value of the data set

### **What Does Semi variance tell you?**

Semi variance is similar to variance, but it only considers observations that are below the mean. Semi variance is a useful tool in portfolio or asset analysis because it provides a measure for downside risk.

While standard deviation and variance provide measures of volatility, semi variance only looks at the negative fluctuations of an asset. Semi variance can be used to calculate the average loss that a portfolio could incur because it neutralizes all values above the mean, or above an investor's target return. For risk-averse investors, determining optimal portfolio allocations by minimizing semi variance could reduce the likelihood of a large decline in the portfolio's value.

## **18.4 Risk**

- Possibility of both ups and downs
- Danger plus opportunity
- Technical measurement is Standard deviation (volatility) of probability distribution of future outcomes. Measures the dispersion around expected value weighted by the probability of occurrence.

Probability Distribution: One way of quantifying risk is to describe outcomes and probability of occurrence in terms of a probability distribution. Most people have heard of the normal or bell-shaped distribution. The normal distribution can be described by its mean and standard deviation.

### **Risk Quantification**

Risk is measured as standard deviation of returns

- Then translated into dollar amounts for a particular situation
- A tolerance for risk is defined either in terms of a probability or number of standard deviations. For example, there is a 66% probability of a one standard deviation movement either way

### **Value-at-risk**

The Question Being Asked in VaR- "What loss level is such that we are X% confident it will not be exceeded in N business days?"

VaR is a useful device for measuring the market risk of a portfolio. It is useful in management reporting. Three attributes are required when reporting a VaR:

- A dollar amount
- A level of confidence

- A time horizon or planning horizon



Value-at-risk example

The Value at Risk measures the potential loss in value of a risky asset or portfolio over a defined period for a given confidence interval. Thus, if the VaR on an asset is \$ 100 million at a one-week, 95% confidence level, there is a only a 5% chance that the value of the asset will drop more than \$ 100 million over any given week

### Advantages of VaR

- It captures an important aspect of risk in a single number
- It is easy to understand
- It asks the simple question: "How bad can things get?"

### VaR - Methods

There are three main approaches to the calculation of a VaR number for a portfolio

- The analytical method also called the variance-covariance method
- The historical simulation method
- The Monte Carlo simulation method,

#### Each method has strengths and weaknesses.

**Historical Method:** The Historical Method is the simplest method among the three to calculate Value at Risk. Historical market data is used to measure the percentage change of each risk factor for each day and then is applied to current market prices which generates a hypothetical data set. This method is based on the assumption that history would repeat itself. The Advantages and limitations of the historical method are

The historical method is a simple and fast method to calculate VaR. For a portfolio, it eliminates the need to estimate the variance-covariance matrix and simplifies the computations especially in cases of portfolios with a large number of assets. This method is also intuitive. VaR corresponds to a large loss sustained over an historical period that is known. Hence users can go back in time and explain the circumstances behind the VaR measure. On the other hand, the historical method has a few of drawbacks. The assumption is that the past represents the immediate future is highly unlikely in the real world. Also, if the horizon window omits important events (like stock market booms and crashes), the distribution will not be well represented. Its calculation is only as strong as the number of correct data points measured that fully represent changing market dynamics even capturing crisis events that may have occurred such as the Covid-19 crisis in 2020 or the financial crisis in 2008.

In fact, even if the data does capture all possible historical dynamics, it may not be sufficient because market will never entirely replicate past movements. Finally, the method assumes that the distribution is stationary. In practice, there may be significant and predictable time variation in risk.

**Parametric method:** The most common way of calculating VaR is the parametric method, also known as variance covariance method. This method assumes that the return of the portfolio is normally distributed and can be completely described by expected return and standard deviations.

**Monte Carlo Method:** In this method, value at risk is measured by creating a number of different scenarios for the future using a nonlinear pricing model. This method is suited when a large variety of risk measurement problems is present.

Monte Carlo simulation is a computerized mathematical technique that allows people to account for risk in quantitative analysis and decision making. The technique is used by professionals in such widely disparate fields.

### VaR Conclusion

- VaR is a powerful tool for consolidating in a single number, risk across a portfolio of assets.

- It provides a mechanism for containing risk within acceptable limits.
- It is a powerful communication tool and for consolidating a measure of risk across portfolios.
- It does not predict the size of the maximum loss.
- VaR is used by regulators to set minimum capital requirements
- Credit VaR can be used to measure the risk of a loan portfolio.

### **Tail value at Risk**

Tail value at risk (TVaR), also known as tail conditional expectation (TCE) or conditional tail expectation (CTE), is a risk measure associated with the more general value at risk. It quantifies the expected value of the loss given that an event outside a given probability level has occurred. The Tail Value-at-Risk, TVaR, of a portfolio is defined as the expected outcome (loss), conditional on the loss exceeding the Value-at-Risk (VaR), of the distribution.

For example, if the estimated loss from a 1 in 100 year hurricane is \$70M, the TVaR is a measure of the average remaining vulnerabilities. Thus, the TVaR is always greater than (or equal to) the VaR for a given probability.

- analyze risk for selecting project.
- interpret various methods of analyzing risk.

## **18.4 Calculating Investment Risk and Analyzing Project**

Companies are faced with the challenge of limited capital and have to decide how to invest this limited capital between different investment projects. When making decisions on which capital projects to finance or invest in, companies are majorly influenced by the relative attractiveness of a project based on risk and return.

### **1. Sensitivity analysis or “what if” analysis**

This provides a range of possible outcomes as specific assumptions are changed. It applies to all projects with quantified benefits and costs and tests which variables are essential to the expected outcomes of a project. This method involves recomputing the project outcomes for different values of the main variables and combinations.

For instance, sensitivity analysis may be used to check the effect of a change in an assumption, say revenues, on the overall profit.

The procedure of conducting sensitivity analysis is as follows:

- Determine the key variables and possible changes of a project;
- Recalculate the variables, for example, NPV; and
- Calculate the “Switching Value.”

Switching value is the value of a variable arising from a change in the investment decision, and it is usually a percentage change from the initial value of the variable. Sensitivity analysis provides different cash flow estimates under three assumptions:

- The worst or most pessimistic
- The expected or most likely
- The best or most optimistic



Example: Compute the NPV of the two projects for each of the possible cash flows using sensitivity analysis.

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Particulars	Project X	Project Y
Initial Investment	Rs. 40000	Rs. 40000
Cash flow estimates		
Worst	6000	0
Most Likely	8000	8000
Best	10000	16000
Required rate of return	10%	10%
Years	15	15

	Project X		Project Y	
	PV	NPV	PV	NPV
Worst	45636	5636	0	-40000
Most Likely	60848	20848	60848	20848
Best	76060	36060	121696	81696

## 2. Break-even Analysis

Break-even analysis is a financial indicator that shows the relationship between fixed costs, variable costs, and revenue. It is majorly associated with the break-even point, which is when no profit or loss is made from the investment. Break-even analysis can be represented either graphically or calculated mathematically.

Regarding capital budgeting, break-even analysis is concerned with determining the break-even level of input at which the net present value of a project is equal to zero. An example of a break-even level technique is the internal rate of return. This is the rate of return at which the NPV of a project is equal to zero. In accounting, break-even analysis computes the amount of production at a given price intended to cover all the costs experienced. 'Break-even quantity of sales' refers to the number of units of a company's product that is produced and sold, at which point the company's net income becomes zero.

### Calculating the Break-Even Point

Determining the break-even point involves a simple mathematical equation. You reach break-even at the point where total costs equal total revenues

$$TC = TR$$

Total costs have fixed and variable components:

Fixed costs (FC) remain the same, regardless of your output. Rent, insurance, and base salaries are examples of fixed costs.

Variable costs (VC) change with the number of units produced or sold. Examples are materials, sales commissions, and direct labor costs. Therefore, total variable costs (TVC) equal the variable costs multiplied by the number of units, or  $TVC = n \times VC$ , where  $n$  is the number of units.

Total costs equal total fixed costs plus total variable costs:  $TC = FC + (n \times VC)$ .



Example

Let's imagine that you're considering launching a new product. Market research has shown that customers will pay \$115 for it, and your sales team is confident that they can sell at least 500 units per month. The equipment you'll need to produce the product costs \$900,000 and this will be spread over three years, giving you a fixed cost of \$25,000 per month. You need to decide if the product is financially viable.

- Fixed costs/month \$25,000
- Variable costs/unit:
  - Direct labor \$20
  - Direct materials \$15
  - Shipping \$5
  - Sales commission \$10
  - Total VC/unit \$50
- Price/unit \$115

To calculate the break-even point, use this equation:

$$n = FC / (P - VC)$$

$$n = 25,000 / (115 - 50)$$

$$n = 384.6$$

The break-even point is 385 units per month. This is below the minimum sales volume that the sales team thinks they can achieve, so the product has a good chance of making money. Break-Even Analysis can also be useful in thinking about pricing. For example, how much would the break-even point increase if you reduced the price to \$105? This should increase the sales volume, but would that compensate enough for the lower price? Using the break-even point, you can manipulate a variety of costs and revenue variables to understand the effects of various scenarios.

### 3. Scenario Analysis

Sensitivity analysis, seen previously, does not allow us to see the interrelationships between the different project inputs. It only allows us to test the impact of a change in a single variable, one at a time, on the overall expected future outcomes of a project. Scenario analysis, on the other hand, is a technique that allows us to consider the impact of changes in more than one input variable on the expected project outcome. This involves choosing particular scenarios or combinations of factors that a project may be exposed to, such as a loss of funding, loss of a supplier, a natural disaster.

These combinations are then modeled and explored to assess the resulting impact on the profitability of a project.

Scenario analysis is vital in deciding to find the best course of action to maximize the returns from a portfolio, that is, determining the best-case scenario and trying to avoid the worst-case scenario.

What are the Benefits of Performing Scenario Analysis?

Future planning – gives investors a peek into the expected returns and risks involved when planning for future investments. The goal of any business venture is to increase revenue over time, and it is best to use predictive analysis when deciding to include an investment in a portfolio.

**Proactive** – Companies can avoid or decrease potential losses that result from uncontrollable factors by being aggressively preventive during worst-case scenarios by analyzing events and situations that may lead to unfavorable outcomes. As the saying goes, it is better to be proactive than reactive when a problem arises.

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### *Unit 18: Investment Risk and Project Analysis*

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**Avoiding risk and failure** – To avoid poor investment decisions, scenario analysis enables businesses or independent investors to assess investment prospects. Scenario analysis takes the best and worst probabilities into account so that investors can make an informed decision.

**Projecting investment returns or losses** – The analysis makes use of tools to calculate the values or figures of potential gains or losses from an investment. This gives concrete, measurable data that investors can base the approaches they take on, for (hopefully) a better outcome.

What are the Drawbacks of Scenario Analysis?

**Requires a high level of skill** – Scenario analysis tends to be a demanding and time-consuming process that requires high-level skills and expertise.

**Unforeseen outcomes** – Due to the difficulty in forecasting what may occur in the future, the actual outcome may be fully unexpected and not foreseen in the financial modeling.

**Cannot model every scenario** – It may be very difficult to envision all possible scenarios and assign probabilities to them. Investors must understand that there are risk factors associated with the outcomes, and they must consider a certain amount of risk tolerance in order to be able to attain the desired goal.

#### **4. Monte Carlo Simulation**

Monte Carlo simulation is a computer-generated sensitivity or scenario analysis that is based on probability models for the factors which drive outcomes. When doing simulations, each event or possible outcome is assigned a probability after which multiple scenarios are run using probability factors assigned to the possible values of a variable.

In finance, we use Monte Carlo simulations to define potential risk. As an example, a mutual fund manager may use the method to manage assets and liabilities to try and establish any downward risk – the risk that liabilities will outgrow the assets leading to a loss.

Monte Carlo simulations are named after the popular gambling destination in Monaco, since chance and random outcomes are central to the modeling technique, much as they are to games like dice, and slot machines. The technique was first developed by Stanislaw Ulam, a mathematician who worked on the Manhattan Project. After the war, while recovering from brain surgery, Ulam entertained himself by playing countless games of solitaire.

He became interested in plotting the outcome of each of these games in order to observe their distribution and determine the probability of winning. After he shared his idea with John Von Neumann, the two collaborated to develop the Monte Carlo simulation. The method can also be used in project appraisal, where the project manager tries to establish the financial viability of a project. In most cases, there is usually an initial cash outlay followed by subsequent costs during the project's productive life. The project also generates profit at specified times during the life of the project. If the present value of profit outweighs that of costs, the project is considered financially feasible.

Both profits and costs are likely to be affected by numerous underlying variables which may include interest rate movements, exchange rate fluctuations. Monte Carlo simulation comes with the advantage of incorporating a wider variety of scenarios in a single run.

It is, however, more expensive relative to other methods of risk analysis and may require the acquisition of an expert's services.

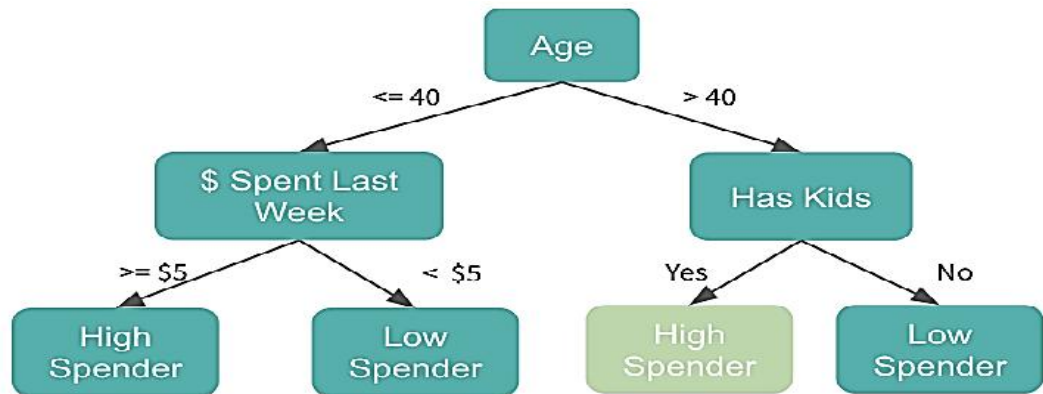
#### **5. Decision Trees Modeling**

Decision tree modeling is a technique for decision-making in project analysis where much complex information needs to be considered. It is used in various fields, such as financial modeling. It provides a useful structure in which alternative decisions and their consequences can be laid down and evaluated.

They also help form an accurate and balanced picture of the risks and rewards resulting from a particular decision, such as choosing an appropriate portfolio.

**Example of a very basic decision tree model:**





We'll go through each yes or no question, or decision node, in the tree and will move down the tree accordingly, until we reach our final predictions. Our first question, which is referred to as our root node, is whether George is above 40 and, since he is, we will then proceed onto the "Has Kids" node. One other note to add – here, we're trying to predict whether George will be a high spender, so this is an example of a classification tree, but we could easily convert this into a regression tree by predicting George's actual dollar spend. The process would remain the same, but the final nodes would be numerical predictions rather than categorical ones.

A good example is the binomial option pricing decision tree analysis.

Decision trees involve an individual making a decision based on the anticipated outcomes of each competing ventures. In this case, outcomes might be a return from a portfolio associated with a certain probability because each decision's impact is known with certainty.

So, the choice of the favorable decision and its outcome is calculated by multiplying the outcome's value and the corresponding probability.

#### Advantages:

- Straightforward interpretation.
- Good at handling complex, non-linear relationships.

#### Disadvantages:

- Predictions tend to be weak, as singular decision tree models are prone to overfitting.
- Unstable, as a slight change in the input dataset can greatly impact the final results.

## 18.5 Practical Problems in Risk Measurement

### Question on Alpha

The actual return of the fund is 30, the risk-free rate is 8%, beta is 1.1, and the benchmark index return is 20%. Calculate Alpha and interpret the result.

#### Solution

The return as per alpha is

$$r = R_f + \beta (R_m - R_f) + \text{Alpha}$$

$$\text{Therefore, Alpha} = R - R_f - \beta (R_m - R_f)$$

So Alpha is calculated as:

$$\text{Alpha} = (0.30 - 0.08) - 1.1 (0.20 - 0.08)$$

$$= 0.088 \text{ or } 8.8\%$$

The result shows that the investment in this example outperformed the benchmark index by 8.8%.

### Question on Beta

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Assume Treasury bills currently yield 2%, the broad stock market is expected to return 10% and Stock B has a beta of 1.3. Calculate the required rate of return of Stock B.

**Solution**

Required rate of return for Stock A =  $2 + 1.3(10 - 2) = 12.4\%$

**Question on Beta**

If a publicly-traded company has a beta of 1.7 and the riskless rate for one-year Treasury bills is 4.5% and the expected return for the market is 12.5%. What is the company's capitalization rate? Suppose the company has current earnings of \$5.20 per share that have been growing at a rate of 6.5%. What should be the company's share price using a capitalization of earnings approach?

**Solution**

Using the CAPM straight-line formula, the capitalization rate (the required return an investor would demand to invest in the company) is

$$4.8\% + 1.7*(12.5\% - 4.5\%) =$$

$$4.8\% + 13.6\% = 18.4\%.$$

Applying the Gordon model, the price should be

$$[\$5.20*(1+.065)] / (.184 - .065) =$$

$$\$5.54 / .119 = \$46.54$$

**Question on R-Squared**

What Is a Good R-Squared Value? Is a Higher R-Squared Better?

**Solution**

In finance, an R-Squared above 0.7 would generally be seen as showing a high level of correlation, whereas a measure below 0.4 would show a low correlation. This is not a hard rule, however, and will depend on the specific analysis.

Here again, it depends on the context. Suppose you are searching for an index fund that will track a specific index as closely as possible. In that scenario, you would want the fund's R-Squared to be as high as possible since its goal is to match—rather than exceed—the index. If on the other hand, you are looking for actively managed funds, a high R-Squared might be seen as a bad sign, indicating that the funds' managers are not adding sufficient value relative to their benchmarks.

**Question on standard deviation**

Suppose a mutual fund achieves the following annual rates of return over the course of five years: 4%, 6%, 8.5%, 2%, and 4%. The mean value, or average, is 4.9%. The standard deviation is 2.46%. What does this mean?

**Solution**

That means that each individual yearly value is an average of 2.46% away from the mean.

**Question on Sharpe**

You are required to:

- (i) Rank these portfolios using Sharpe's method and Treynor's method; and
- (ii) Compare the ranking and explain the reasons behind the differences.

Portfolio	Average annual return	Standard Deviation	Correlation with market
A	22.0	21.2	0.70
B	18.6	26.0	0.80
C	14.8	18.0	0.62
D	15.1	8.0	0.95
E	26.5	19.3	0.65
F	(-) 9.0	4.0	0.42
Market Risk	12.0	12.0	
Free Rate	9.0		

## Solution

Portfolio	Sharpe's Method $[(R_p - R_f) / \sigma_p]$	Ranking	$\beta = \rho \times (\sigma_p / \sigma_m)$	Treynor Method $[(R_p - R_f) / \beta]$	Ranking
A	$[(22-9)/21.2]=0.6132$	3	$0.70 \times 21.2/12=1.237$	$[(22-9)/1.237]=10.509$	2
B	$[(18.6-9)/26]=0.3692$	4	$0.80 \times 26/12=1.733$	$[(18.6-9)/1.733]=5.540$	5
C	$[(14.8-9)/18]=0.3222$	5	$0.62 \times 18/12=0.936$	$[(14.8-9)/0.936]=6.237$	4
D	$[(15.1-9)/8]=0.7625$	2	$0.95 \times 8/12=0.633$	$[(15.1-9)/0.633]=9.632$	3
E	$[(26.5-9)/19.3]=0.9067$	1	$0.65 \times 19.3/12=1.045$	$[(26.5-9)/1.045]=16.746$	1
F	$[(9-9)/4]=(-)0.42$	6	$0.42 \times 4/12=0.140$	$[(9-9)/0.42]=(-)128.571$	6

Comparison and Reasons for difference:

- Sharpe index considers only the standard deviation and leaves market standard deviation and the correlation, whereas Treynor considers market standard deviation and correlation.
- Greater correlation result in greater value of Beta. This would reduce the points in Treynor.
- Owing to correlation effect, the portfolios B & D which ranked 4 and 2 in Sharpe are pushed to positions backwards in Treynor; and similarly, the portfolios A & C are to positions upwards in Treynor.

## Question on Value at Risk

Consider a position consisting of a \$100,000 investment in asset A and a \$100,000 investment in asset B.

Assume that the daily volatilities of both assets are 1% and that the coefficient of correlation between their returns is 0.3. What is the 5-day 99% value at risk for the portfolio?

## Solution

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The standard deviation of the daily change in the investment in each asset is \$1,000. The variance of the portfolio's daily change is

$$1,000^2 + 1,000^2 + 2 \times 0.3 \times 1,000 \times 1,000 = 2,600,000$$

The standard deviation of the portfolio's daily change is the square root of this or \$1,612.45. The standard deviation of the 5-day change is

The standard deviation of the portfolio's daily change is the square root of this or \$1,612.45.

The standard deviation of the 5-day change is 5 Square root multiply by 1612.45=3605.55

This means that 1% of a normal distribution lies more than 2.33 standard deviations below the mean. The 5-day 99 percent value at risk is therefore  $2.33 \times 3,605.55 = \$8,400.93$

### Question on Value at Risk

Consider a position consisting of a \$300,000 investment in gold and a \$500,000 investment in silver. Suppose that the daily volatilities of these two assets are 1.8% and 1.2%, respectively, and that the coefficient of correlation between their returns is 0.6.

What is the 10-day 97.5% value at risk for the portfolio? By how much does diversification reduce the VaR?

### Solution

The variance of the portfolio (in thousands of dollars) is

$$0.018^2 \times 300^2 + 0.012^2 \times 500^2 + 2 \times 300 \times 500 \times 0.6 \times 0.018 \times 0.012 = 104.04$$

The standard deviation is 10.2.

Since, the 1-day 97.5% VaR is  $10.2 \times 1.96 = 19.99$  and the 10-day 97.5% VaR is 10 square root multiply by 19.99=63.22

VaR is therefore \$63,220.

The 10-day 97.5% value at risk for the gold investment is 5400 Multiply by square root 10 multiply by 1.96=33740

The 10-day 97.5% value at risk for the silver investment is =6000\*Square root 10\*1.96=37188

The diversification benefit is  $33740 + 37188 - 63220 = \$7348$

### Question on Break Even Point

Suppose XYZ Ltd is expecting to sell 10,000 units at a price of \$10 each. The variable cost associated with the product is \$5 per unit, and the fixed cost is coming \$15,000 per year. Do the break-even analysis for the given case.

### Solution

To calculate the Break-Even Point (Quantity) for which we have to divide the total fixed cost by the contribution per unit.

Here, Selling Price per unit = \$10

Variable Cost per unit = \$5

So, Contribution per unit = \$10 - \$5 = \$5

Hence Break-Even Point (Quantity) = \$15000 / \$5 units

Break-Even Point (Quantity) = 3000 Units

#### **Question on Break Even Point**

Franco Co-operation makes iron benches and wants to determine the break-even point. The total fixed cost for his business is \$60,000 and the variable cost is \$40 per bench. He sells the bench for \$100 per unit.

#### **Solution**

A Contribution per Unit is calculated by using the formula given below

Contribution per Unit = Selling Price - Variable Costs

Contribution per unit = \$100 - \$40

Contribution per unit = **\$60**

Now let's calculate the number of benches Franco needs to achieve Break-Even. Break-Even Point is calculated by using the formula given below

Break-Even = Fixed Costs / Contribution per Unit

Break-Even = \$60,000 / \$60

Break-Even = 1000 benches

When Franco produces 1500 benches the total cost is \$120,000 and the total revenue is \$150,000. The break-even point is where total costs equal total revenue and in this case, it is at \$100 \* 1000 = \$100000

#### **Question on Sensitivity analysis**

J&B Inc. The original or expected Sales Volume is \$582,401 arising out of 7882 units and at the rate of \$73.89.

To conduct the sensitivity analysis - J&B Inc conducted two models with different input variables for the Pessimistic Model of less than 20% sales and the Optimistic Model of more than 20%.

#### **Solution**

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	Pessimistic	Expected	Optimistic
	20% Decrease in Sales	Original Sales	15 % Increase in Sales
<b>Sales:</b>			
Units	\$6,305.60	\$7,882.00	\$9,064.30
Selling Price per Unit	\$73.89	\$73.89	\$73.89
Total Sales	\$465,920.78	\$582,400.98	\$669,761.13
<b>Variable Costs:</b>			
Cost of Goods Sold	\$104,152.80	\$130,191.00	\$149,719.65

### Summary

Risk is variability of return in investment. Quantification of risk is important in investment. The important risk measures include the alpha, beta, R-squared, standard deviation, and Sharpe ratio. . Variance tells you the degree of spread in your data set. The more spread the data, the larger the variance is in relation to the mean.

Value at risk answers what loss at a given confidence level will not be exceeded in N business days. The company chooses the various project based on risk and return. The various methods used are sensitive analysis, breakeven analysis, and scenario analysis and decision tree modeling.

### Keywords

Risk: It means variability of return associated with investment.

Investment risk: It is the probability or likelihood of occurrence of losses relative to the expected return on any particular investment.

Break-even point: It is point at which total revenue is equal to total cost.

Decision tree modeling: It provides a useful structure in which alternative decisions and their consequences can be laid down and evaluated.

### Self Assessment

- The----- of being unable to sell your investment at a fair price and get your money out when you want to.
  - Liquidity risk
  - Concentration risk
  - Both of the above
  - Not Applicable
- The -----of loss because your money is concentrated in one investment or type of investment.
  - Liquidity risk
  - Concentration risk

- C. Both of the above  
D. Not Applicable
3. The -----of loss from reinvesting principal or income at a lower interest rate.
- A. Liquidity risk  
B. Concentration risk  
C. Reinvestment risk  
D. Not Applicable
4. Variance tells you the degree of spread in your data set. The more spread the data, the -----  
----- the variance is in relation to the mean.
- A. Larger  
B. Smaller  
C. Both of the above  
D. None of the above
5. -----variance stocks tend to be good for aggressive investors, while -----  
variance stocks tend to be good for conservative investors who have less risk tolerance.
- A. High, Low  
B. Low, High  
C. High, High  
D. None of the above
6. ----- is a measurement of data that can be used to estimate the potential  
downside risk of an investment portfolio.
- A. Beta  
B. Variance  
C. Semi variance  
D. None of the above
7. You reach break-even at the point where
- A.  $TC = TR$   
B.  $TC$  is greater than  $TR$   
C.  $TR$  is greater than  $TC$   
D. None of the above
8. Total costs equal total fixed costs plus total -----
- A. Variable costs  
B. Fixed cost  
C. Both of the above  
D. None of the above
9. If the interest rate goes up, the market value of bonds will -----

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**Unit 18: Investment Risk and Project Analysis**

- A. Drop  
 B. Rise  
 C. Will not react  
 D. Not Applicable
10. -----is the risk of losing money because of a movement in the exchange rate.
- A. Currency risk  
 B. Reinvestment risk  
 C. Liquidity risk  
 D. None of the above
11. -----is the risk which arises when the government entity or company that issued the bond will run into financial difficulties and won't be able to pay the interest or repay the principal at maturity Filter test is a test used for which form
- A. Currency risk  
 B. Reinvestment risk  
 C. Liquidity risk  
 D. Credit risk
12. Risk in financial terms is the chance that an outcome or investment's actual gains will differ from an expected outcome or return.
- A. True  
 B. False
13. Standard deviation provides a measure of the volatility of asset prices in comparison to their historical averages in a given time frame.
- A. True  
 B. False
- 14 Beta of less than one means security is more volatile then market.
- A. True  
 B. False
15. Beta of more than one means security is less volatile then market.
- A. True  
 B. False

**Answers for Self Assessment**

1. A      2. B      3. C      4. A      5. A  
 6. C      7. A      8. A      9. A      10. A



11. D            12. A            13. A            14. B            15. B

### **Review Questions**

- 1) What do you mean Risk?
- 2) Enumerate the various types of Investment risk.
- 3) Differentiate between variance and semi variance.
- 4) Elaborate different methods of calculating risk measurement in the project.



### **Further Readings**

Apte, P.G., International Financial Management, Tata McGraw Hill Publishing Company Limited, New Delhi.

Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.



### **Web Links**

<https://www.thestreet.com/markets/what-is-risk-14909043>

<https://www.investopedia.com/terms/r/riskmeasures.asp#:~:text=The%20five%20measures%20include%20the,investment%20holds%20the%20most%20risk>

<https://www.scribbr.com/statistics/variance/#:~:text=The%20variance%20is%20a%20measure,in%20relation%20to%20the%20mean>

<https://www.investopedia.com/ask/answers/041415/what-are-some-common-measures-risk-used-risk-management.asp>

## Unit 19: Option Greeks and Risk Management

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### Objective

- Understand option greeks and risk management.
- Examine use of greeks for hedging risk.
- Interpret option delta for risk management.

### Introduction

Options are financial derivatives which are used as risk management tools for hedging the portfolios. That is, the goal is to offset potential unfavorable moves in other investments. Options contracts are also used for speculating on whether an asset's price might rise or fall.

An option's price can be influenced by a number of factors that can either help or hurt traders depending on the type of positions they have taken. Successful traders understand the factors that influence options pricing, which include the so-called "Greeks"—a set of risk measures so named after the Greek letters that denote them, which indicate how sensitive an option is to - time-value decay, changes in implied volatility, and movements in the price of its underlying security.

The options traders can play safe in the volatile markets with the help of knowledge of the Greeks associated with the options. Time-value decay, changes in implied volatility, and movements in the price of its underlying security. The options traders can play safe in the volatile markets with the help of knowledge of the Greeks associated with the options.

### 19.1 Greek Letter Variable/Determinant

#### **Option Delta**

Option delta represents the sensitivity of the option price with respect to change in the price of the underlying asset. Delta for an option is calculated as:

$$\Delta S \quad \text{Delta} = \frac{C_1 - C_0}{S_1 - S_0} = \frac{\Delta C}{\Delta S}$$

Where  $\Delta C$  = change in price of the call over a short time interval

$\Delta S$  = change in price of the underlying stock over a short interval



#### Example of Delta

For example, suppose that one out-of-the-money option has a delta of 0.25, and another in-the-money option has a delta of 0.80. A \$1 increase in the price of the underlying asset will lead to a \$0.25 increase in the first option and a \$0.80 increase in the second option. Traders looking for the greatest traction may want to consider high deltas, although these options tend to be more expensive in terms of their cost basis since they're likely to expire in-the-money. An at-the-money option, meaning the option's strike price and the underlying asset's price are equal, has a delta value of approximately 50 (0.5 without the decimal shift). That means the premium will rise or fall by half a point with a one-point move up or down in the underlying security.

In another example, if an at-the-money wheat call option has a delta of 0.5 and wheat rises by 10 cents, the premium on the option will increase by approximately 5 cents ( $0.5 \times 10 = 5$ ) or \$250 (each cent in a premium is worth \$50).

Delta changes as the options become more profitable or in-the-money. In-the-money means that a profit exists due to the option's strike price being more favorable to the underlying's price. As the option gets further in the money, delta approaches 1.00 on a call and -1.00 on a put with the extremes eliciting a one-for-one relationship between changes in the option price and changes in the price of the underlying.

#### Delta Interpretation

In effect, at delta values of -1.00 and 1.00, the option behaves like the underlying security in terms of price changes. This behavior occurs with little or no time value as most of the value of the option is intrinsic.

- Call has a positive delta and Put has a negative delta.
- Option delta will lie between -1 and +1.

Puts generate negative delta because they have a negative relationship with the underlying security—that is, put premiums fall when the underlying security rises, and vice versa. Conversely, call options have a positive relationship with the price of the underlying asset. If the underlying asset's price rises, so does the call premium, provided there are no changes in other variables such as implied volatility or time remaining until expiration. If the price of the underlying asset falls, the call premium will also decline, provided all other things remain constant.

The delta increases in absolute terms as the option goes further in-the-money and decreases as the option goes out-of-the-money.

Deep in-the-money call options have a delta that approaches +1.00 as they are most likely to be exercised. Similarly, deep in-the-money put options would have a delta tending towards -1.00. Deep out-of-the-money calls and puts have deltas that approach zero as the probability that they will be exercised is nearly zero.

The delta of the underlying asset is always 1.00.

#### Delta and Directional Risk

Delta is also used when determining directional risk. Positive deltas are long (buy) market assumptions, negative deltas are short (sell) market assumptions, and neutral deltas are neutral market assumptions. When you buy a call option, you want a positive delta since the price will increase along with the underlying asset price. When you buy a put option, you want a negative delta where the price will decrease if the underlying asset price increases.

Three things to keep in mind with delta:

- Delta tends to increase closer to expiration for near or at-the-money options.
- Delta is further evaluated by gamma, which is a measure of delta's rate of change.
- Delta can also change in reaction to implied volatility changes.

### Delta Hedging

The option's delta changes with changes in stock price. Requires traders to frequently readjust their positions in order to remain delta neutral. This process is called rebalancing. Delta hedging therefore is a dynamic hedging strategy.

### Cost involved in Delta Hedging

Although effective as a hedging strategy, delta hedging carries a cost.

Every time a portfolio is rebalanced, the difference between the price paid for a stock and the price received for it creates this cost.

This is so because this hedging strategy calls for buying when stock prices rise and selling when they fall.

### Dynamic Hedging

A long position in a stock and short position in call option of the same underlying leads to a delta-neutral portfolio. Holding delta share and selling one call lead to a risk neutral outcome, other things remaining same. This is an example of delta hedging.

such a package of option and share is called a delta neutral portfolio. For hedging the portfolio then number of calls to be hedged can be derived as:

Number of options needed to delta hedge = number of shares hedged / delta of call option

### Delta Neutrality

Lower the delta lesser is the change in the value of the portfolio. Delta of the portfolio is weighted sum of deltas of individual assets comprising it. Delta neutrality means that the small change in price of the underlying would have no impact on the value of the portfolio.

Delta neutrality means making the delta of the portfolio zero. Traders with large positions in derivatives strive to achieve it.



What does it mean to assert that the delta of a call option is 0.8? How can a short position in 1,000 options be made delta neutral when the delta of each option is 0.8?

A delta of 0.8 means that, when the price of the stock increases by a small amount, the price of the option increases by 80% of this amount. Similarly, when the price of the stock decreases by a small amount, the price of the option decreases by 80% of this amount. A short position in 1,000 options has a delta of -800 and can be made delta neutral with the purchase of 800 shares.

## 19.2 Risk Management & Option Gamma

Gamma is an important measure of the convexity of a derivatives value, in relation to the underlying. A delta hedge strategy seeks to reduce gamma in order to maintain a hedge over a wider price range. A consequence of reducing gamma, however, is that alpha will also be reduced.

Gamma is the first derivative of delta and is used when trying to gauge the price movement of an option, relative to the amount it is in or out of the money. In that same regard, gamma is the second derivative of an option's price with respect to the underlying's price.

### Option Gama

Gamma is the rate of change in an option's delta per 1-point move in the underlying asset's price. Think of gamma as the delta of the delta. Gamma captures the rate of change of delta, it helps us get an answer for a question such as "What is the expected value of delta for a given change in underlying."

As an analogy to physics, the delta of an option is its "speed," while the gamma of an option is its "acceleration."

Since an option's delta measure is only valid for short period of time, gamma gives traders a more precise picture of how the option's delta will change over time as the underlying price changes. Delta is how much the option price changes in respect to a change in the underlying asset's price.



The calculation of gamma is complex and requires financial software or spreadsheets to find a precise value. However, the following demonstrates an approximate calculation of gamma.

Consider a call option on an underlying stock that currently has a delta of 0.4. If the stock value increases by \$1, the option will increase in value by \$0.40, and its delta will also change. After the \$1 increase, assume the option's delta is now 0.53. The 0.13 difference in deltas can be considered an approximate value of gamma.

### Understanding Gamma Movements

For example, if the futures price is 200, a 220 call has a delta of 30 and a gamma of 2.

If the futures price increases to 201, the delta is now 32. Conversely, if the futures price decreased to 199, the delta is 28. Just like delta, gamma is dynamic. It is the highest when the underlying price is near the option's strike price.

### Calculating Gamma

Gamma is the difference in delta divided by the change in underlying price.

$$\frac{\Delta_1 - \Delta_2}{P_1 - P_2}$$

You have an underlying futures contract at 200 and the strike is 200. The options delta is 50 and the options gamma is 3. If the futures price moves to 201, the options delta is changes to 53. If the futures price moves down to 199, the options delta is 47.

Across the two-point underlying futures contract move, the delta changed by 6.  $6 \div 2$  is 3.



### Understanding Gamma Movements

For Example consider this -

Nifty Spot = 8326

Strike = 8400

Option type = CE

Moneyness of Option = Slightly OTM

Premium = Rs.26/-

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Delta = 0.3  
 Gamma = 0.0025  
 Change in Spot = 70 points  
 New Spot price =  $8326 + 70 = 8396$   
 New Premium = ??  
 New Delta = ??  
 New Moneyness = ??

Let's figure this out -

- Change in Premium = Delta \* change in spot i.e.  $0.3 * 70 = 21$
- New premium =  $21 + 26 = 47$
- Rate of change of delta = 0.0025 units for every 1 point change in underlying
- Change in delta = Gamma \* Change in underlying i.e.  $0.0025 * 70 = 0.175$
- New Delta = Old Delta + Change in Delta i.e.  $0.3 + 0.175 = 0.475$
- New Moneyness = ATM

When Nifty moves from 8326 to 8396, the 8400 CE premium changed from Rs.26 to Rs.47, and along with this the Delta changed from 0.3 to 0.475. Notice with the change of 70 points, the option transitions from slightly OTM to ATM option. Which means the option's delta has to change from 0.3 to somewhere close to 0.5. This is exactly what's happening here.

### Gamma Behavior

As the underlying moves away from the strike price, the gamma decreases. As the underlying moves towards the strike price, the gamma increases. When the option is near or at the money, gamma is at its largest.

All options that are a long position have a positive gamma, while all short options have a negative gamma. Gamma decreases, approaching zero, as an option gets deeper in the money and delta approaches one. Gamma also approaches zero the deeper an option gets out-of-the-money. Gamma is at its highest when the price is at-the-money.

Gamma is an important metric because it corrects for convexity issues when engaging in hedging strategies. Some portfolio managers or traders may be involved with portfolios of such large values that even more precision is needed when engaged in hedging.

A third-order derivative named "color" can be used. Color measures the rate of change of gamma and is important for maintaining a gamma-hedged portfolio.

## 19.3 Option Theta & Risk Management

Theta is part of the group of measures known as the Greeks, which are used in options pricing. Remember—options give the buyer the right to buy or sell an underlying asset at the strike price before the option expires. The strike price, which is also called an exercise price, is set when the contract is first written, informing the investor of the price at which the underlying asset must reach before the option can be exercised.

- An option's profitability decreases as time goes on. But what happens when two options are similar but one expires over a longer period of time?
- The value of the longer-term option is higher since there is a greater chance or more time that the option could move beyond the strike price.

If all else remains equal, the time decay causes an option to lose extrinsic value as it approaches its expiration date.

Therefore, theta is one of the main Greeks that option buyers should worry about since time works against long option holders. Conversely, time decay is favorable to an investor who writes options.

Option writers benefit from time decay because the options written become less valuable as the time to expiration approaches. Consequently, it is cheaper for option writers to buy back the options to close out the short position.

### What is Option Theta?

The term theta refers to the rate of decline in the value of an option due to the passage of time. It can also be referred to as the time decay of an option. This means an option loses value as time moves closer to its maturity, as long as everything is held constant.

Theta represents the time value decline of an options contract. To help you remember: the "T" in theta stands for "Time." Theta is generally expressed as a negative number and can be thought of as the amount by which an option's value declines every day.



#### Example of Theta

For example, if the value of an option is 7.50 and the option has a theta of .02. After one day, the option's value will be 7.48, 2 days 7.46. etc.

Let's assume an investor purchases a call option with a strike price of \$1,150 for \$5. The underlying stock is trading at \$1,125. The option has five days until expiration and theta is \$1. In theory, the value of the option drops \$1 per day until it reaches the expiration date. This is unfavorable to the option holder.

Assume the underlying stock remains at \$1,125 and two days have passed. The option will be worth approximately \$3. The only way the option becomes worth more than \$5 again is if the price rises above \$1,155. This would give the option at least \$5 in intrinsic value (\$1,155 - \$1,150 strike price), offsetting the loss due to theta or time decay.

### How Theta Behave

- Theta is highest for at-the-money (ATM) options and lower the further out-the-money or in-the-money the option is.
- The absolute value of theta of an option that is at- or near-the-money rises as the option approaches expiration. Theta for an option that is deep in- or out- the-money falls as the option approaches expiration.

## 19.4 Option Vega & Risk Management

Vega falls under the series of sensitivity measures called the Greeks. Vega is not a Greek letter; however, it is denoted by the Greek letter nu ( $\nu$ ). Vega measures an option's sensitivity to the underlying asset's volatility. Vega measures the amount of increase or decrease in an option premium based on a 1% change in implied volatility.

### Vega & Implied volatility

- Implied volatility refers to the expected volatility of the underlying asset. Implied volatility can be shortened to IV or just volatility.
- A higher IV means there is more uncertainty around the price of the stock. As IV increases, you would expect to see larger swings in the price.

IV is expressed as a percentage change associated with one standard deviation, annualized. An implied volatility of 20% would mean that the standard deviation over the next year would be a 20% change in price. In a normal distribution, it would be a 68.2% probability of a 20% change in price. If the price of the underlying asset is \$100, then you would expect the stock to be between \$80 and \$120 in the next year.



#### Example of Vega

Assume hypothetical stock ABC is trading at \$50 per share in January and a February \$52.50 call option has a bid price of \$1.50 and an ask price of \$1.55. Assume that the Vega of the option is 0.25 and the implied volatility is 30%. The call options are offering a competitive spread: the spread is

## Unit 19: Option Greeks and Risk Management

smaller than the Vega. That does not mean the option is a good trade, or that it will make the option buyer money. This is just one consideration, as too high of a spread could make getting into and out of trades more difficult or costly.

If the implied volatility increases to 31%, then the option's bid price and ask price should increase to \$1.75 and \$1.80, respectively (1 x \$0.25 added to bid-ask spread). If the implied volatility decreased by 5%, then the bid price and ask price should theoretically drop to \$0.25 by \$0.30 (5 x \$0.25 = \$1.25, which is subtracted from \$1.50 and \$1.55). Increased volatility makes option prices move expensive, while decreasing volatility makes options drop in price.

### Vega Behavior

Call and put options are more valuable with higher volatility so Vega is positive for both calls and puts. Volatility is a very important input to a option valuation model, as options are very sensitive to changes in volatility.

Vega is maximum for options that are at the money. The longer an option contract has until it expires, the more volatility affects the price. Vega falls as the option gets closer to expiration and increases as the underlying moves closer to the strike. In other words, Vega is centered around at-the-money and falls as it moves out-of-the-money or in-the-money.

### How is Vega used?

#### Long and Short Option's Vega

Long options have a positive Vega and short options have a negative Vega. When buying an option, the purchaser wants the premium to increase and when selling an option, the seller wants the premium to decrease.

Should implied volatility increase, there will be an increase in the option's premium. Inversely, if there is a decrease in implied volatility, there will be a decrease in the option's premium. This is why Vega is positive for long (purchased) positions and negative for short (sold) positions.

Vega changes when there are larger price swings (higher implied volatility) which can be equated to higher uncertainty. Lower implied volatility can be connected to lower uncertainty, which equates to less dramatic swings of the underlying security.

A long Vega portfolio means there is positive exposure to increases in implied volatility and a short Vega portfolio is indicative of volatility vulnerability.

### Measuring Volatility

Vega can be used to measure volatility exposure in multi-leg option strategies or an option's portfolio.



For example:

- Long 1 XYZ 60 Call with 60 Days to Expiration at +.50 Vega (Long Volatility)
- Short 1 XYZ 60 Call with 30 Days to Expiration at -.30 Vega (Short Volatility)
- Net Vega: + .20 Vega
- This trade is long Vega and has positive volatility exposure.

### How to Interpret Vega?

There are three main things that affect Vega. It is affected by the time until expiration, the strike price relative to the underlying asset's spot price, and the implied volatility.

The longer time there is until the expiration of an option, the higher the extrinsic value of the premium. The reason the extrinsic value is the ability to hold the option and the opportunity for the option to gain value as the underlying asset moves in price.

The option strike price relative to the asset spot price is important too. If an option is very out of the money, the Vega tends to be smaller. It is because even if volatility changes, there is still not a very high chance that the option will end up in the money, meaning the price will not show a significant difference.



Let us look at a hypothetical call option with a premium of \$5 and an underlying asset with a price of \$100. If the IV is 20% and the Vega of the option is 0.10, what would happen to the option price if the IV rose to 22%? The 2% increase should mean that the change in price would be an increase of  $2 \times 0.10 = \$0.20$ . You would expect the price to increase from \$5.00 to \$5.20. If the IV instead fell by 2%, you would expect a decrease in the price of \$0.20, resulting in a price of \$4.80.

Higher volatility generally means a higher extrinsic value priced into the premium of an option. The reason for this is that the time value is heavily influenced by the implied volatility. A higher IV means a greater chance for the underlying asset to move in price and the option to increase in value before the expiration date.

## 19.5 Option Rho & Risk Management

Rho is the rate at which the price of a derivative changes relative to a change in the risk-free rate of interest. ... For example, if an option or options portfolio has a rho of 1.0, then for every 1 percentage-point increase in interest rates, the value of the option (or portfolio) increases 1 percent.

Rho may also refer to the aggregated risk exposure to interest rate changes that exist for a book of several options positions.

The exact formula for rho is complicated. But it is calculated as the first derivative of the option's value with respect to the risk-free rate. For example, assume that a call option is priced at \$4 and has a rho of 0.25. If the risk-free rate rises 1 percent, say from 3 percent to 4 percent, the value of the call option would rise from \$4 to \$4.25.



### Delta- Example #1

Let us take the example of a commodity X which was trading at \$500 in the commodity market one month back and the call option for the commodity was trading at a premium of \$45 with a strike price of \$480. Now, currently, the commodity is trading at \$600 while the value of the option has surged up to \$75. Calculate the delta of the call option based on the given information.

Solution

- Delta  $\Delta$  is calculated using the formula given below
- Delta  $\Delta = (Of - Oi) / (Sf - Si)$
- Delta  $\Delta = (\$75 - \$45) / (\$600 - \$500)$
- Delta  $\Delta = \$0.30$

Therefore, the delta of the call option is \$0.30 where a positive sign indicates an increase in value with the increase in underlying stock price value which is the characteristic of a call option.



### Delta - Example #

Let us take another example of a benchmark index which currently trading at \$8,000 while the put option for the index is trading at \$150. If the index was trading at \$7,800 a month back while the put option was trading at \$200, then calculate the delta of the put option.

Solution

- Delta  $\Delta$  is calculated using the formula given below
- Delta  $\Delta = (Of - Oi) / (Sf - Si)$
- Delta  $\Delta = (\$150 - \$200) / (\$8,000 - \$7,800)$
- Delta  $\Delta = -\$0.25$

Therefore, the delta of the put option is -\$0.25 where a negative sign indicates a decrease in value with the increase in underlying stock price value which is the characteristic of a put option.



### Delta- Example #

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A company uses delta hedging to hedge a portfolio of long positions in put and call options on a currency. Which of the following would give the most favorable result?

- A virtually constant spot rate
- Wild movements in the spot rate

Explain your answer.

Also for a financial institution with a portfolio of short positions in put and call options on a currency.

Solution

- A long position in either a put or a call option has a positive gamma. when gamma is positive the hedger gains from a large change in the stock price and loses from a small change in the stock price. Hence the hedger will fare better in case (b).
- A short position in either a put or a call option has a negative gamma. When gamma is negative the hedger gains from a small change in the stock price and loses from a large change in the stock price. Hence the hedger will fare better in case (a).



Theta- Example #

What does it mean to assert that the theta of an option position is  $-0.1$  when time is measured in years?

If a trader feels that neither a stock price nor its implied volatility will change, what type of option position is appropriate?

Solution

A theta of  $-0.1$  means that if units of time pass with no change in either the stock price or its volatility, the value of the option declines by  $0.1$ . A trader who feels that neither the stock price nor its implied volatility will change should write an option to create as high a positive theta position as possible.



Gamma- Example #

The Gamma of an ATM Put option is  $0.004$ , if the underlying moves 10 points, what do you think the new delta is?

Solution

Since we are talking about an ATM Put option, the Delta must be around  $-0.5$ . Remember Put options have a  $-ve$  Delta. Gamma, as you notice, is a positive number, i.e.  $+0.004$ . The underlying moves by 10 points without specifying the direction, so let us figure out what happens in both cases.

Case 1 - Underlying moves up by 10 points

- Delta =  $-0.5$
- Gamma =  $0.004$
- Change in underlying = 10 points
- Change in Delta = Gamma \* Change in underlying =  $0.004 * 10 = 0.04$
- New Delta = We know the Put option loses delta when underlying increases, hence  $-0.5 + 0.04 = -0.46$

Case 2 - Underlying goes down by 10 points

- Delta =  $-0.5$
- Gamma =  $0.004$
- Change in underlying =  $-10$  points
- Change in Delta = Gamma \* Change in underlying =  $0.004 * -10 = -0.04$

- New Delta = We know the Put option gains delta when underlying goes down, hence  $-0.5 + (-0.04) = -0.54$



## Gamma- Example #

A portfolio of derivatives on a stock has a delta of 2400 and a gamma of  $-10$ . An option on the stock with a delta of 0.5 and a gamma of 0.04 can be traded. What position in the option is necessary to make the portfolio gamma neutral.

Solution

The options must have a gamma of  $+10$  to neutralize the gamma of the portfolio. Each option has a gamma of 0.04. Hence a long position of  $10/0.04 = 250$  options is required.

## Vega- Example #

A European call and put option have the same strike price and time to maturity. The call has an implied volatility of 30% and the put has an implied volatility of 25%. What trades would you do?

Solution

The put has a price that is too low relative to the call's price. The correct trading strategy is to buy the put and sell the call.

**Question on Calculating Position Delta for a single-leg strategy**

Mr. X own 10 contracts of XYZ calls, each with a delta of .75. Calculate position delta.

Solution

To calculate position delta, multiply  $.75 \times 100$  (assuming each contract represents 100 shares)  $\times 10$  contracts. This gives Mr. X a result of 750.

- Long 10XYZ Calls
- Delta .75
- Position Delta  $.75 \times 100 \times 10 = 750$

That means your call options are acting as a substitute for 750 shares of the underlying stock. So Mr. X can figure if the stock goes up \$1, the position will increase roughly \$750. If the underlying stock goes down \$1, the position will decrease roughly \$750.

**Question on Calculating Position Delta for multiple contracts**

The details of an XYZ long call spread with a long 55-strike and a short 60-strike, both with the same expiration date. Imagine that with the stock trading at \$56.55, we bought 15 contracts of 55-strike calls with a delta of .61 and we sold 15 contracts of 60-strike calls with a delta of .29.

Solution

## Calculating Leg 1

The delta of the 55-strike call is .61. So to determine the total delta, we multiply  $.61 \times 100$  share multiplier  $\times 15$  contracts. That equals 915.

## Calculating Leg 2

The delta of the 60-strike call is .29. However, since you're selling the calls, for this part of your position the delta will actually be negative:  $-0.29$ . So the short 60 calls' total delta is  $-0.29 \times 100$  share multiplier  $\times 15$  contracts. That equals  $-435$ .

## Calculating Total Position Delta

Now you simply add the deltas from each leg together to determine your position delta:  $915 + (-435) = 480$ . So the theoretical change in position value based on a \$1 move in the underlying stock is \$480. Therefore, the total value of this position will behave like 480 shares of stock XYZ.

**Question on Volatility**

Nifty Spot = 8547

Nifty Volatility = 16.5%

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TCS Spot = 2585

TCS Volatility = 27%

Given this information, can you predict the likely range within which Nifty and TCS will trade 1 year from now?

**Solution**

Let us put the numbers to good use -

Asset

Nifty Lower Estimate  $8547 - (16.5\% * 8547) = 7136$

Upper Estimate  $8547 + (16.5\% * 8547) = 9957$

TCS Lower Estimate  $2585 - (27\% * 2585) = 1887$

Upper Estimate  $2585 + (27\% * 2585) = 3282$

**Question on Volatility**

A company trading its stock at Rs.100. The money call and put options are trading at Rs.3 each. The delta value of the call option would be 0.5 and that of the put option -0.5.

What position he should be taken in volatile market?

**Solution**

- Traders need to buy one call and put a contract (with 100 options each) at a strike price of Rs.100. The overall delta value would be neutral and the total cost for the trader would be Rs.600.
- The trader gets a profit when the stock becomes volatile. Profit can be made from calls if the stock price rises and from puts if the stock price goes down. Moreover, the trader can even make a fair amount of profit even if the stock exhibits a neutral trend.
- This strategy is comparatively better than the effects of time decay. However, this method is best suitable only when the investor can expect an increase in the volatility of the stock.

**Question on Delta Neutral Trading Strategy**

On October 7th, a trader thinks that the gold market is due to continue in its bullish ways. December gold futures are currently trading at 1357. He will look to exit the position on or before November 3rd before the FOMC announcement.

He decides that it is in his best interest to use a delta neutral options strategy in case his market outlook is incorrect. He finds that the December 1360 Gold calls are theoretically underpriced. He decides to purchase 10 calls for \$3300 each. The delta for the options is 50. November 3rd is now here and the trader is still in the position. His 1360 calls are now worth \$1640 and futures are currently trading at 1338. He offsets his options at 1640 and buys back his futures at 1338. The market did not continue its bullish ways. What is the position of trader?

**Solution**

In order to be properly hedged, he will need to sell 5 underlying gold contracts to reach delta neutral.

Long 10 December 1360 gold calls for a total delta of +500 ( $50 * 10$ )

Short 5 December underlying gold futures for a total delta of -500 ( $100 * 5$ )

Total delta = 0

Options:

\$3300 (Premium paid per option)

- 1640 (Premium received for selling options)

\$1660 loss per option for a total loss of \$16,600 ( $1660 * 10$  options)

Futures:

\$1357

- 1338

19 points gained in futures

x \$100 per point

+\$1900 per contract for a total gain of \$9,500 (1900 \* 5 contracts)

Total Profit / Loss:  $-16,600 + 9,500 = -\$7,100$  loss, not including commissions and fees

### **Question on call option Delta**

Consider a \$55 strike call option on a stock. The stock is currently trading at \$57 (underlying price) and the option at \$2.60 (option premium). The option's delta is 0.75. If the stock grows by \$1 to \$58, we can expect the call option premium to grow by amount?

Solution

The delta tells us how the option premium will approximately change if the underlying price increases by \$1. If the stock grows by \$1 to \$58, we can expect the call option premium to grow by approximately  $\$0.75$  to  $2.60 + 0.75 = \$3.35$ .

Delta is the ratio of option price change and underlying price change.

### **Question on put option Delta**

Consider a \$55 strike put option on the same stock as in our call example. With the stock trading at \$57, the put option's premium is \$0.52 and its delta is -0.25. If the stock's price grows by \$1 to \$58, the put option's premium goes down by what amount?

Solution

If the stock's price grows by \$1 to \$58, the put option's premium goes down by approximately \$0.25 to  $0.52 - 0.25 = \$0.27$ . The delta is negative, which indicates the put option's premium moving in opposite direction from the underlying price.

### **Question on Vega**

The value of an option is 7.50, implied volatility is at 20 and the option has a Vega of .12. Assuming that implied volatility moves from 20 to 21.5 then what should be the price of option?

Also if the volatility dropped from 20 to 18 then what should be the price of option?

Solution

Assuming that implied volatility moves from 20 to 21.5. This is a 1.5 volatility increase. The option price will increase by  $1.5 \times .12 = .18$  to 7.68.

Conversely, if volatility dropped from 20 to 18. This two-point decrease times .12 equals .24, making the option premium 7.26.

### **Question on Theta**

The value of an option is 7.50 and the option has a theta of .02. What should be the value after one day and after two days?

Solution

If the value of an option is 7.50 and the option has a theta of .02. After one day, the option's value will be 7.48.

After two days option's value will be 7.46.

## Unit 19: Option Greeks and Risk Management

Theta is highest for at-the-money (ATM) options and lower the further out-the-money or in-the-money the option is. The absolute value of theta of an option that is at- or near-the-money rises as the option approaches expiration. Theta for an option that is deep in- or out- the-money falls as the option approaches expiration.

### **Question on Portfolio delta**

Suppose a financial institution has the following three positions in options on a stock:

1. A long position in 100,000 call options with strike price \$55 and an expiration date in 3 months. The delta of each option is 0.533.
2. A short position in 200,000 call options with strike price \$56 and an expiration date in 5 months. The delta of each option is 0.468.
3. A short position in 50,000 put options with strike price \$56 and an expiration date in 2 months. The delta of each option is 0.50

Solution

The delta of the whole portfolio is

$$100,000 \times 0.533 - 200,000 \times 0.468 - 50,000 \times -0.508 = -14,900$$

This means that the portfolio can be made delta neutral by buying 14,900 shares.

### **Question on Hedging**

An individual has 30,000 shares of Neev knowledge management that is currently quoting at \$70. A call option with the strike price of \$70 is currently selling for \$3.5 and has a delta of 0.75. Calculate the number of call options that should be short sold to create a delta hedge.

Solution

Number of options needed to delta hedge

number of shares hedged / delta of call option

$$\text{Number of options to be delta hedge} = 30000 / 0.75$$

40,000 options need to be shorted to create a delta neutral hedge

### **Summary**

With the option greeks knowledge the trader can play safe in option market. An option's price is influenced by a number of factors that can either help or hurt traders depending on the type of positions they have taken. There are several option Greeks like delta, theta, gamma, vega and Rho. Every option Greek influences the price of stock, the understanding of which will improve the skill for a favorable position.

### **Keywords**

**Gamma:** It is the rate of change in an option's delta per 1-point move in the underlying asset's price.

**Theta:** It is the rate of decline in the value of an option due to the passage of time.

**Delta neutrality:** It means that the small change in price of the underlying would have no impact on the value of the portfolio. .

**Implied volatility:** It refers to the expected volatility of the underlying asset

### **Self Assessment**

1. Rho measures

- A. Measures expected change in an option's price per one percentage point change in interest rates
- B. Measures how the implied volatility of a stock affects the price of the options on that stock.
- C. Measures the change in the price of an option for a one-day decrease in its time to expiration.
- D. Measures the degree to which an option is exposed to shifts in the price of the underlying asset

2. Delta measures

- A. Measures expected change in an option's price per one percentage point change in interest rates
- B. Measures how the implied volatility of a stock affects the price of the options on that stock.
- C. Measures the change in the price of an option for a one-day decrease in its time to expiration.
- D. Measures the degree to which an option is exposed to shifts in the price of the underlying asset

3. Theta measures

- A. Measures expected change in an option's price per one percentage point change in interest rates
- B. Measures how the implied volatility of a stock affects the price of the options on that stock.
- C. Measures the change in the price of an option for a one-day decrease in its time to expiration.
- D. Measures the degree to which an option is exposed to shifts in the price of the underlying asset

4. Gamma measures

- A. Measures expected change in an option's price per one percentage point change in interest rates
- B. Measures how the implied volatility of a stock affects the price of the options on that stock.
- C. Measures the change in the price of an option for a one-day decrease in its time to expiration.
- D. Measures the degree to which an option is exposed to shifts in the price of the underlying asset

5. Vega measures

- A. Measures expected change in an option's price per one percentage point change in interest rates
- B. Measures how the implied volatility of a stock affects the price of the options on that stock.
- C. Measures the change in the price of an option for a one-day decrease in its time to expiration.
- D. Measures the degree to which an option is exposed to shifts in the price of the underlying asset

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*Unit 19: Option Greeks and Risk Management*

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6. Call has a ----- delta and Put has a ----- delta
- A. Positive, Negative
  - B. Negative, Positive
  - C. Both of the above
  - D. None of the above
7. As the underlying moves away from the strike price, the gamma ----- . As the underlying moves towards the strike price, the gamma -----.
- (a) Decrease, Increases
  - (b) Increases, Decrease
  - (c) Both of the above
  - (d) None of the above
8. An option's profitability ----- as time goes on.
- (a) Increases
  - (b) Decreases
  - (c) Both of the above
  - (d) None of the above
9. The value of the longer-term option is -----since there is a greater chance or more time that the option could move beyond the strike price.
- (a) Higher
  - (b) Lower
  - (c) Will not react
  - (d) Not Applicable
- 10 Long options have a ----- vega and short options have a negative vega.
- (a) Positive, Negative
  - (b) Negative, Positive
  - (c) Both of the above
  - (d) None of the above
11. -----volatility generally means a higher extrinsic value priced into the premium of an option.
- A. Higher
  - B. Lower
  - C. No Impact
  - D. Not Applicable
12. Delta neutrality means that the small change in price of the underlying would have no impact on the value of the portfolio.
- A. True



B. False

13. When the option is near or at the money, gamma is at its lowest.

A. True

B. False

14 Implied volatility refers to the expected volatility of the underlying asset.

A. True

B. False

15. A higher IV means there is more uncertainty around the price of the stock.

A. True

B. False

### **Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. D  | 3. C  | 4. D  | 5. B  |
| 6. A  | 7. A  | 8. B  | 9. A  | 10. A |
| 11. A | 12. A | 13. B | 14. A | 15. A |

### **Review Questions**

- 1) What do you mean option Greeks?
- 2) Enumerate the various types of option Greeks.
- 3) Differentiate between delta and theta.
- 4) Elaborate Rho and its implication in taking stock position.



### **Further Readings**

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### **Web Links**

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## Unit 20: Contemporary Issues

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### Objective

- Interpret implications of lessons of derivatives in financial crises.
- Understand relationship between different variables of currency valuation.
- Interpret implications of relationship between oil and currencies.
- Interpret implications of challenges of global financial management.

### Introduction

Derivative is a financial asset which derives its value from specified underlying asset. The derivatives derive its value from the performance of the underlying asset. It may be shares, debentures, tangible commodities, currencies, indices or long term or short term securities.

The derivatives play vital functions like risk reduction through hedging, ensuring market efficiency, deal price discovery of the underlying asset, etc. Innovation of derivatives have redefined and revolutionized the landscape of financial industry across the world and derivatives have earned a well-deserved and extremely significant place among all the financial products.

Derivatives are risk management tool that help in effective management of risk by various stakeholders. Derivatives provide an opportunity to transfer risk, from the one who wish to avoid it; to one, who wish to accept it. Factors like increased volatility in financial asset prices, growing integration of national financial markets with international markets, development of more sophisticated risk management tools, wider choices of risk management strategies to economic agents and innovations in financial engineering, have been driving the growth of financial derivatives worldwide.

### 20.1 Advantages of Derivatives

#### Hedging risk exposure

Derivatives are primarily used for hedging risks. For example, an investor may purchase a derivative contract whose value moves in the opposite direction to the value of an asset the investor owns. In this way, profits in the derivative contract may offset losses in the underlying asset.

#### **Underlying asset price determination**

Derivatives are frequently used to determine the price of the underlying asset. For example, the spot prices of the futures can serve as an approximation of a commodity price.

#### **Market efficiency**

It is considered that derivatives increase the efficiency of financial markets. By using derivative contracts, one can replicate the payoff of the assets. Therefore, the prices of the underlying asset and the associated derivative tend to be in equilibrium to avoid arbitrage opportunities.

#### **Access to unavailable assets or markets**

Derivatives can help organizations get access to otherwise unavailable assets or markets. By employing interest rate swaps, a company may obtain a more favorable interest rate relative to interest rates available from direct borrowing.

## **20.2 What Is a Financial Crisis?**

In a financial crisis, asset prices see a steep decline in value, businesses and consumers are unable to pay their debts, and financial institutions experience liquidity shortages.

A financial crisis is often associated with a panic or a bank run during which investors sell off assets or withdraw money from savings accounts because they fear that the value of those assets will drop if they remain in a financial institution. Banking panics were at the genesis of several financial crises of the 19th, 20th, and 21st centuries, many of which led to recessions or depressions. Other situations that may be labeled a financial crisis include the bursting of a speculative financial bubble, a stock market crash, a sovereign default, or a currency crisis. A financial crisis may be limited to banks or spread throughout a single economy, the economy of a region, or economies worldwide.

#### **Causes of Financial Crisis**

Contributing factors to a financial crisis include systemic failures, unanticipated or uncontrollable human behavior, incentives to take too much risk, regulatory absence or failures, or contagions that amount to a virus-like spread of problems from one institution or country to the next.

If left unchecked, a crisis can cause an economy to go into a recession or depression. Even when measures are taken to avert a financial crisis, they can still happen, accelerate, or deepen.

#### **Types of Financial Crises**

**Banking crisis:** When a bank suffers a sudden rush of withdrawals by depositors, this is called a bank run. Since banks lend out most of the cash they receive in deposits, it is difficult for them to quickly pay back all deposits if these are suddenly demanded, so a run renders the bank insolvent, causing customers to lose their deposits, to the extent that they are not covered by deposit insurance. An event in which bank runs are widespread is called a systemic banking crisis or banking panic.

**Currency crisis:** A currency crisis, also called a devaluation crisis, is normally considered as part of a financial crisis. In general, a currency crisis can be defined as a situation when the participants in an exchange market come to recognize that a pegged exchange rate is about to fail, causing speculation against the peg that hastens the failure and forces a devaluation.

**Speculative bubbles and crashes:** A speculative bubble exists in the event of large, sustained overpricing of some class of assets. One factor that frequently contributes to a bubble is the presence of buyers who purchase an asset based solely on the expectation that they can later resell it at a higher price, rather than calculating the income it will generate in the future. If there is a bubble, there is also a risk of a crash in asset prices: market participants will go on buying only as long as they expect others to buy, and when many decide to sell the price will fall.

## World's Five Devastating Financial Crises

**Credit Crisis of 1772:** This crisis originated in London and quickly spread to the rest of Europe. In the mid-1760s the British Empire had accumulated an enormous amount of wealth through its colonial possessions and trade. This created an aura of over optimism and a period of rapid credit expansion by many British banks. The hype came to an abrupt end on June 8, 1772, when Alexander Fordyce—one of the partners of the British banking house fled to France to escape his debt repayments.

The news quickly spread and triggered a banking panic in England, as creditors began to form long lines in front of British banks to demand instant cash withdrawals. The ensuing crisis rapidly spread to Scotland, the Netherlands, other parts of Europe, and the British American colonies.

**The Great Depression of 1929–39:** This was the worst financial and economic disaster of the 20th century. Many believe that the Great Depression was triggered by the Wall Street crash of 1929 and later exacerbated by the poor policy decisions of the U.S. government.

The Depression lasted almost 10 years and resulted in massive loss of income, record unemployment rates, and output loss, especially in industrialized nations. In the United States the unemployment rate hit almost 25 percent at the peak of the crisis in 1933.

**The OPEC Oil Price Shock of 1973:** This crisis began when OPEC member decided to retaliate against the United States in response to its sending arms supplies to Israel during the Fourth Arab-Israeli War.

OPEC countries declared an oil embargo, abruptly halting oil exports to the United States and its allies. This caused major oil shortages and a severe spike in oil prices and led to an economic crisis in the U.S. and many other developed countries. What was unique about the ensuing crisis was the simultaneous occurrence of very high inflation and economic stagnation. As a result, economists named the era a period of “stagflation” (stagnation plus inflation), and it took several years for output to recover and inflation to fall to its pre crisis levels.

**The Asian Crisis of 1997:** This crisis originated in Thailand in 1997 and quickly spread to the rest of East Asia and its trading partners. Speculative capital flows from developed countries to the East Asian economies of Thailand, Indonesia, Malaysia, Singapore, Hong Kong, and South Korea had triggered an era of optimism that resulted in an overextension of credit and too much debt accumulation in those economies.

In July 1997 the Thai government had to abandon its fixed exchange rate against the U.S. dollar that it had maintained for so long, citing a lack of foreign currency resources. That started a wave of panic across Asian financial markets and quickly led to the widespread reversal of billions of dollars of foreign investment. It took years for things to return to normal. The Financial Crisis of 2007–08: This sparked the Great Recession, the most-severe financial crisis since the Great Depression, and it wreaked havoc in financial markets around the world.

Triggered by the collapse of the housing bubble in the U.S., the crisis resulted in the collapse of Lehman Brothers (one of the biggest investment banks in the world), brought many key financial institutions and businesses to the brink of collapse, and required government bailouts of unprecedented proportions. It took almost a decade for things to return to normal, wiping away millions of jobs and billions of dollars of income along the way.

## Lessons from Recent Crisis in Derivatives Market

Recent derivatives litigation and regulatory enforcement actions make it abundantly clear that derivatives shortcomings and outright abuses worsened the recent financial crisis. The resulting derivatives litigation and regulatory enforcement actions provide a stern reminder that substantial damage can occur when derivatives are misused.

### Complex Financial Instruments

Derivatives are among the most complex financial instruments. They are often difficult to understand, use and value. Rapid growth in the market for a new security, such as collateralized debt obligations (CDOs), may be difficult to manage and can have potentially negative consequences if the new product is poorly designed and misunderstood.

### Derivatives increase exposure to specific risks

Derivatives increase exposure to specific risks, which tends to magnify potential gains but also losses. Surprisingly large losses can result when markets are volatile.

#### **Fraud and Breach-of contract disputes**

Rapid over-the-counter (OTC) derivatives market growth opened the door to fraud and breach-of contract disputes. Derivatives are frequently used by unscrupulous promoters to commit fraud because of their complexity, leverage, and lack of price transparency. They exploit investors' lack of familiarity by misleading them about the risks and potential return.

#### **Risk management systems and regulators failure**

While derivative product sophistication seemed to grow in the years leading up to the financial crisis, risk management systems failed to keep pace, and regulators failed to spot the escalating problems. But most derivatives still trade in fragmented OTC markets, these markets still lack price transparency, there is still only limited public reporting of derivatives positions, and significant systemic risk likely remains in the financial system.

#### **Disadvantages of Derivatives**

Despite the benefits that derivatives bring to the financial markets, the financial instruments come with some significant drawbacks. The drawbacks resulted in disastrous consequences during the Global Financial Crisis of 2007-2008. The rapid devaluation of mortgage-backed securities and credit-default swaps led to the collapse of financial institutions and securities around the world.

#### **High risk**

The high volatility of derivatives exposes them to potentially huge losses. The sophisticated design of the contracts makes the valuation extremely complicated or even impossible. Thus, they bear a high inherent risk.

#### **Speculative features**

Derivatives are widely regarded as a tool of speculation. Due to the extremely risky nature of derivatives and their unpredictable behavior, unreasonable speculation may lead to huge losses.

#### **Counter-party risk**

Although derivatives traded on the exchanges generally go through a thorough due diligence process, some of the contracts traded over-the-counter do not include a benchmark for due diligence. Thus, there is a possibility of counter-party default.

### **20.3 Importance of Crude Oil in Global Trade**

Oil, as the world's most heavily traded natural resource and the bedrock foundation of some of the planet's largest economies, has always had a strong impact on virtually every area of economics and finance. The global oil trade is estimated to be worth something in the region of around \$4 trillion a year in revenues, or about 3.8% of global GDP.

#### **Crude Oil Prices – Highest and Lowest**

The highest recorded price per barrel maximum of \$147.02 was in year, 2008.

The lowest recorded price per barrel minimum of \$11.26 was in year, 2020.

#### **Recent Oil Crises**

In 2020, worldwide demand for oil fell rapidly as governments closed businesses and restricted travel due to the COVID-19 pandemic. An oil price war between Russia and Saudi Arabia erupted in March when the two nations failed to reach a consensus on oil production levels.

In April, an oversupply of oil led to an unprecedented collapse in oil prices, forcing the contract futures price for West Texas Intermediate (WTI) to plummet from \$18 a barrel to around -\$37 a barrel. By the summer of 2020, oil prices began to rebound as nations emerged from lockdowns and the Organization of the Petroleum Exporting Countries (OPEC) agreed to major cuts in crude oil production.

By year-end, optimism about the planned rollout of multiple COVID-19 vaccines buoyed the market; in November, Brent crude oil spot prices increased to an average of \$43 a barrel. WTI

finished 2020 at a price of \$49 per barrel, while Brent crude finished the year at a price of \$51 per barrel.

### **Understanding the Correlation of Oil & Currency**

Policymakers, academics and journalists have frequently discuss the link between oil prices and exchange rates. The exchange rate is one of the important channels for the international crude oil price shock to pass to the real economy and financial markets. One area where oil prices have an outside, global impact is on currency values. Virtually every national currency in the world is regularly impacted by developments within oil markets on an almost daily basis.

There is a hidden string that ties currencies to crude oil. With the price actions in one venue, it forces a sympathetic or opposing reaction in the other. This correlation persists for many reasons, including resource distribution, the balance of trade (BOT), and market psychology. Also, there is crude oil's significant contribution to inflationary and deflationary pressures that intensifies these interrelationships during strongly trending periods – both to the upside and to the downside.

### **Oil-Producing Economies and Currency Prices**

One of the most apparent correlations between currency prices and oil can be seen in countries that produce and export oil as a major component of their economies. Such countries are naturally very dependent on high oil prices, meaning that a collapse can have the effect of eroding the value of their national currency.

Value of currency pairs is largely based on the economic performance and standing of the countries involved. Currency traders will often look at national economic developments to predict a correlating fall or rise in the value of currency pairs.

### **Oil-Importing Economies and Currency Prices**

When a country that is heavily dependent on oil exports, such as Russia or Saudi Arabia, experiences a collapse in oil prices, a correlating collapse in the value of their national currency and vice versa.

Oil is priced in dollars, and the dollar is still the most widely used international currency. The US dollar is the main invoice and settlement currency of the international oil market. The change of the US dollar exchange rate will inevitably affect the international crude oil price. If the dollar appreciates, the purchasing power of the oil-importing country's currency will be weakened. This will affect the exchange rate of a country, and vice versa. The exchange rate is a key transmission variable. In the context of economic globalization, the impact of exchange rates on international trade and international financial quotas is also increasing.

### **Relationship of Dollar & Oil**

The United States of America is the largest producer and exporter of oil in the world, so it makes sense that the US dollar would be impacted by global oil prices. However, the US economy is not very dependent on oil exports, which actually only makes up a small percentage of GDP. More important is the fact that crude oil prices are always quoted in US dollars. This means that no matter where you are in the world, you are essentially trading for oil in dollars.

When the value of the dollar is high relative to other currencies such as the Euro and the Japanese Yen, you need fewer US dollars to pay for a barrel of crude. However, when the value of the dollar is low, more dollars are needed to pay for that same barrel. While this is good news for the US, it can be bad news for countries that are net importers of oil, such as Japan or the UK. Such countries can find themselves paying more for oil depending on the fortunes of the US dollar.

There is no denying that oil remains the world's most important commodity for a number of reasons. The close correlation between crude oil prices and currency values will continue to shape economic trends for decades to come.

### **The Currencies Most Affected by Falling Oil Prices**

In 2015, oil prices have plunged globally in the wake of rising oil production and concerns about global economic growth.

Prices have fallen by plummeting to levels that markets have not seen since the near-total collapse of world trade during the Great Recession of 2009.

- The Canadian Loonie
- The Russian Ruble
- The Colombian Peso
- The Norwegian Krone
- The Brazilian Real

It makes sense that nations that are more dependent on crude oil exports have incurred greater economic damage than those with more diverse resources.

The countries with the highest crude oil exports based on barrels per day, according to the CIA's World Factbook with data from 2014:

- Saudi Arabia with 7.3 million
- Russia with 5.1 million
- Iraq with 3.3 million
- The United Arab Emirates with 2.7 million
- Canada with 2.7 million

A currency that is significantly impacted by the rising and falling oil prices is commonly known as a petrocurrency.

In short, a petrocurrency is the currency of an oil-producing nation – like Russia or Canada – that has significant amounts of oil exports as a percentage of its entire export portfolio. Given such a large share of exports, the currency will rise and fall in correlation with the price of oil.

#### **Conclusion of Correlation of Oil & Currency**

Crude oil shows a tight correlation with many currency pairs for three reasons.

First, the contract is quoted in U.S. dollars so pricing changes have an immediate impact on related crosses. Second, high dependence on crude oil exports levers national economies to uptrends and downtrends in the energy markets. And third, collapsing crude oil prices will trigger sympathetic declines in industrial commodities, raising the threat of worldwide deflation, forcing currency pairs to re-price relationships.

## **20.4 Foreign Exchange Reserves**

Foreign-exchange reserves, also called Forex reserves, are, in a strict sense, only foreign-currency deposits held by national central banks and monetary authorities. These foreign-currency deposits are the financial assets of the central banks and monetary authorities that are held in different reserve currencies (e.g. the U.S. dollar, the Euro, the Japanese Yen, the Chinese Yuan, the Swiss Franc, the Indian Rupee and the Pound Sterling) and which are used to back its liabilities. Before the end of the gold standard, gold was the preferred reserve currency.

### **Foreign Exchange Reserves Importance**

Foreign currency reserves are vital to a nation's economic well-being. Without adequate reserves, a country may be unable to pay for critical imports, such as crude oil, or service its external debt. Inadequate reserves can also limit a central bank's available responses in the event of an economic crisis. Foreign currency reserves can also be used to control exchange rates, which in turn affects global trade. If a currency, whether fixed or floating, begins to deviate from its desired rate with a foreign currency, the central bank can buy and sell reserves as needed to restore the intended exchange rate.

Maintaining foreign currency reserves is vital to the economic health of a nation. Countries use foreign currency reserves to keep a fixed rate value, maintain competitively priced exports, remain liquid in case of crisis, and provide confidence for investors.

The top 10 nations in terms of foreign currency reserves had combined reserve assets of \$8.8 trillion as of December 2021, more than 40% of which was accounted for by China and Hong Kong.



### Impact of Federal Policy Decision on Forex Valuations

It's been often observed how truly global the financial markets have become and how easily capital today flows between different countries and regions in search of opportunities. Because America has the world's largest economy, every economic move that the US makes has immediate effects on the global markets. So any decision of federal policy on any front will impact forex valuation. Monetary policy in the United States comprises the Federal Reserve's actions and communications to promote maximum employment, stable prices, and moderate long-term interest rates.

### Impact of Interest Rate Federal Policy Decision on Forex Valuations

Interest rate is directly related with the valuation of currency of any country. It is analyzed that due to higher interest prevailing in an economy will generate higher deposits from investors and thus higher return to lenders as well. Therefore higher interest rates attract foreign investors to invest their capital in the concerned country and yield higher return.



For an example if USA interest rates tend to rise, it will attract investors to deposit money in USA banks and financial institutions in order to obtain higher assured returns out of their investment. Therefore demand for dollars will increase leads to an appreciation in the currency.

The federal funds rate is the rate banks charge each other for lending their excess reserves or cash. Some banks have excess cash, while other banks might have short-term liquidity needs. However, the fed funds rate has a far more sweeping impact on the economy as a whole. The fed funds rate is a key tenet of interest rate markets and is used to set the prime rate, which is the rate banks charge their clients for loans.

### Impact of Inflation Rate Federal Policy Decision on Forex Valuations

The fed funds rate is a target rate set by the Federal Reserve Bank and is usually the basis for the rate that commercial banks lend to each other.

The Fed, through the FOMC or Federal Open Market Committee, adjusts rates depending on the economy's needs. If the FOMC believes the economy is growing too quickly, and it's likely that inflation or rising prices might occur, the FOMC will increase the fed funds rate. Conversely, if the FOMC believes that the economy is struggling or might dip into a recession, the FOMC would lower the fed funds rate. Higher rates tend to slow lending and the economy, while lower rates tend to spur lending and economic growth.

One of the ways the Fed achieves full employment and stable prices is by setting its inflation target rate. In other words, as the inflation component of the index rises, it signals that the prices of goods are rising in the economy. If prices are rising, but wages aren't growing, people's purchasing power is declining. Inflation also impacts investors. For example, if an investor is holding a fixed-rate bond paying 3% and inflation rises to 2%, the investor is only earning 1% in real terms.

Adjustments to the federal funds rate can also affect inflation in the United States. When the Fed increases interest rates, it encourages people to save more and spend less, reducing inflationary pressures. Conversely, when the economy is in a recession or growing too slowly, and the Fed reduces interest rates, it stimulates spending spurring inflation.

In general, and under normal economic conditions, increases in the federal funds rate lead to higher rates for interest rate products throughout the U.S. The result is usually an appreciation of the U.S. dollar. Of course, the correlation between the fed funds rate and the dollar can break down. Also, there are other ways that the dollar can weaken or strengthen. For example, demand for U.S. bonds as a safe-haven investment in times of turmoil can strengthen the dollar independently of where interest rates are set.

### Impact of Politics Federal Policy Decision on Forex Valuations

The recent history of the U.S. clearly illustrates the critical importance of a country's overall perceived political and economic stability in relation to its currency valuations. As the U.S. government and consumer debt rise, the Federal Reserve moves to maintain interest rates near zero in an attempt to stimulate the U.S. economy. When the economy recovers and grows, the Fed responds by incrementally raising interest rates.

Even with historically low-interest rates, the U.S. dollar still enjoys favorable exchange rates in relation to the currencies of most other nations. This is partially due to the fact that the U.S. retains, at least to some extent, the position of being the reserve currency for much of the world. Also, the U.S. dollar is still perceived as a safe haven in an economically uncertain world. This factor – even more so than interest rates, inflation, or other considerations – has proven to be significant for maintaining the relative value of the U.S. dollar.

### **Impact of Investment Federal Policy Decision on Forex Valuations**

Investors have a wide variety of investment options. When comparing the average dividend yield on a blue-chip stock to the interest rate on a certificate of deposit (CD) or the yield on a U.S. Treasury bond (T-bonds), investors will often choose the option that provides the highest rate of return. The current federal funds rate tends to determine how investors will invest their money, as the returns on both CDs and T-bonds are affected by this rate.

Rising or falling interest rates also affect consumer and business psychology. When interest rates are rising, both businesses and consumers will cut back on spending. This will cause earnings to fall and stock prices to drop. On the other hand, when interest rates have fallen significantly, consumers and businesses will increase spending, causing stock prices to rise. Interest rates also affect bond prices. There is an inverse relationship between bond prices and interest rates, meaning that as interest rates rise, bond prices fall, and as interest rates fall, bond prices rise. The longer the maturity of the bond, the more it will fluctuate in relation to interest rates.

Interest rates affect the economy by influencing stock and bond interest rates, consumer and business spending, inflation, and recessions. However, it is important to understand that there is generally a 12-month lag in the economy, meaning that it will take at least 12 months for the effects of any increase or decrease in interest rates to be felt. By adjusting the federal funds rate, the Fed helps keep the economy in balance over the long term. Understanding the relationship between interest rates and the U.S. economy will allow us to understand the big picture and make better investment decisions.

## **20.5 Financial Technology**

### **Meaning-Financial Technology**

Financial technology is the technology and innovation that aims to compete with traditional financial methods in the delivery of financial services. It is an emerging industry that uses technology to improve activities in finance. The use of smartphones for mobile banking, investing, borrowing services, and crypto currency are examples of technologies aiming to make financial services more accessible to the general public.

### **Meaning-Fintech**

Fintech is a portmanteau of the terms “finance” and “technology” and refers to any business that uses technology to enhance or automate financial services and processes. That is “New financial industry that applies technology to improve financial activities.”

The term encompasses a rapidly growing industry that serves the interests of both consumers and businesses in multiple ways. When fintech emerged in the 21st Century, the term was initially applied to the technology employed at the back-end systems of established financial institutions. Since then, however, there has been a shift to more consumer-oriented services and therefore a more consumer-oriented definition. Fintech now includes different sectors and industries such as education, retail banking, fundraising and nonprofit, and investment management to name a few.

### **A Brief History of Fintech**

While fintech seems like a recent series of technological breakthroughs, the basic concept has existed for some time. Early credit cards in the 1950s generally represent the first fintech products available to the public, in that they eliminated the need for consumers to carry physical currency in their day-to-day lives.

From there, fintech evolved to include bank mainframes and online stock trading services. In 1998, PayPal was founded, representing one of the first fintech companies to operate primarily on the internet – a breakthrough that has been further revolutionized by mobile technology, social media,

and data encryption. This fintech revolution has led to the mobile payment apps, blockchain networks, and social media-housed payment options we regularly use today.

### Stages of financial technology

Era	Fintech 1.0 1866-1967	Fintech 2.0 1968-2008	Fintech 3.0 2008-now	Fintech 3.5 2008-now
Geography	Developed world	Global	Developed world	Developing world
Key players	Infrastructure	Banks, brokers, exchange operators	Startups and Bigtech	Startups and Bigtech/Telcos
Shift origin	Globalization of financial services	Technology: digitalization of finance	Financial crisis	Market structure
Instruments	Cable, telephone, telex	ATM, SWIFT, Nasdaq, Algo trading, Bloomberg	Paralization of incumbents; data-driven and platform-based	Leapfrog into mobile-based, convenience seeking people

### How Does Fintech Work?

Fintech simplifies financial transactions for consumers or businesses, making them more accessible and generally more affordable. It can also apply to companies and services utilizing AI, big data, and encrypted blockchain technology to facilitate highly secure transactions amongst an internal network. Broadly speaking, fintech strives to streamline the transaction process, eliminating potentially unnecessary steps for all involved parties. For example, a mobile service like Venmo or Cash App allows you to pay other people at any time of day, sending funds directly to their desired bank account.

### The Technologies That Power Fintech

Modern fintech is primarily driven by AI, big data, and blockchain technology – all of which have completely redefined how companies transfer, store, and protect digital currency. Specifically, AI can provide valuable insights on consumer behavior and spending habits for businesses, allowing them to better understand their customers.

Big data analytics can help companies predict changes in the market and create new, data-driven business strategies. Blockchain, a newer technology within finance, allows for decentralized transactions without inputs from a third party; tapping a network of blockchain participants to oversee potential changes or additions to encrypted data.

### Fintech Examples & Uses

Though the industry conjures up images of startups and industry-changing technology, traditional companies and banks are also constantly adopting fintech services for their own purposes.

Here's a quick look at how the industry is both disrupting and enhancing some areas of finance.

#### Banking

Mobile banking is a large part of the fintech industry. In the world of personal finance, consumers have increasingly demanded easy digital access to their bank accounts, especially on a mobile device. Most major banks now offer some kind of mobile banking feature, especially with the rise of digital-first banks, or "Neobanks". Neobanks are essentially banks without any physical branch locations, serving customers with checking, savings, payment services and loans on completely mobile and digital infrastructure.

#### Cryptocurrency & Blockchain

Running parallel to fintech is the birth of crypto currency and block chain. Block chain is the technology that allows crypto currency mining and marketplaces to exist, while advancements in crypto currency technology can be attributed to both block chain and fintech. Though block chain and crypto currency are unique technologies that can be considered outside the realm of fintech, in theory, both are necessary to create practical applications that move fintech forward.

**Investment & Savings**

Fintech has caused an explosion in the number of investing and savings apps in recent years. More than ever, the barriers to investing are being broken down by companies like Robinhood, Stash and Acorns. While these apps differ in approach, each uses a combination of savings and automated small-dollar investing methods, such as instant round-up deposits on purchases, to introduce consumers to the markets.

**Machine Learning & Trading**

Being able to predict where markets are headed is the Holy Grail of finance. With billions of dollars to be made, it's no surprise machine learning has played an increasingly important role in fintech. The power of this AI-subset lies in its ability to run massive amounts of data through algorithms designed to spot trends and risks, allowing consumers, companies, banks and additional organizations to have a more informed understanding of investment and purchasing risks earlier on in the process.

**Payments**

Moving money around is something fintech is very good at. The phrase "I'll Venmo you" is now a replacement for "I'll pay you later." Venmo, of course, is a go-to mobile payment platform. Payment companies have changed the way we all do business. It's easier than ever to send money digitally anywhere in the world. In addition to Venmo, popular payment companies include Zelle, Paypal, Stripe and Square.

**Lending**

Fintech is also overhauling credit by streamlining risk assessment, speeding up approval processes and making access easier. Billions of people around the world can now apply for a loan on their mobile devices, and new data points and risk modeling capabilities are expanding credit to underserved populations. Additionally, consumers can request credit reports multiple times a year without dinging their score, making the entire backend of the lending world more transparent for everyone.

**Insurance**

While insurtech is quickly becoming its own industry, it still falls under the umbrella of fintech. Insurance is a somewhat slow adopter of technology, and many fintech startups are partnering with traditional insurance companies to help automate processes and expand coverage. From mobile car insurance to wearable's for health insurance, the industry is staring down tons of innovation.

**Financial technology: Impact**

Fintech could help alleviating bad financial health of:

- Hundreds of million people with no access to basic financial services.
- Tens of thousands of small enterprises with no access to credit.

And, by doing so, boost economic growth and welfare.

**Advantages of Fintech**

The rapid development of Fintech is also helping to bring new opportunities to increase transparency, reduce costs and also make information more accessible.

**Savings:** Not only for companies that are avoiding the hiring of a local rental staff the operating costs are reduced exponentially.

**Flexibility:** Allows you to save information, query data in different alternatives that you could not previously, it also gives you the flexibility to be able to do it anywhere, anytime.

**Transparency:** Companies can manage in a transparent and fast way. All in one click on your home community from computer.

**Customer services & revenue:** Fintech improves the quality of traditional financial institutions by increasing efficiency and productivity. Furthermore, by delivering better and more contemporary services, firms' client retention rates are certain to rise, resulting in increased revenues.

**Efficiency:** This is an unsaid benefit of fintech technology that it can offer efficiency with all other obvious benefits. Fintech is known for adding efficiency to the process. Automation doesn't involve humans and hence automation offers a high level of specialization. As a result, it has a high degree of efficiency and service quality.

### Disadvantages of Fintech

**Security:** Data that is available online can easily be stolen by third parties. They could be used for lucrative purposes or even for identity theft.

**Compliance with government regulations:** Finance is one of the most regulated sectors. There will always be interference from the government even if you leverage the traditional Fintech software that doesn't use blockchain and other crucial technologies.

**It can ruin privacy:** Current fintech often only works because it strongly digitizes our way. When you use an app like Uber or book Airbnb, you create extensive knowledge. At an even more essential level, those who have a way to your financial information can also get a picture of your actions.

**Lack of Mobile and Tech Expertise:** In the fintech industry, some of the finance companies or banks don't have proper or convenient mobile banking services. However, some banks try to replicate websites, but in this digital world, nobody would prefer a mobile application. Every user wants a seamless and convenient option to use. However, there are many challenges we face and yet to overcome in the FinTech industry. Regulations and various government policies are challenging for fintech companies. However, we should always keep a balance between new technologies and compliance with the traditional system in order to disrupt the financial industry.

Although, it's not easy to adopt new trends and technologies. But with time, mobile technologies will become even more common in the financial sector, as they're impactful and convenient for people while helping to work more efficiently.

### Post Covid Fintech Scenario & Future

Fintech has been a buzzword in the world of finance and has the capability to extend financial inclusion, improve the daily lives of people, and spur growth. COVID-19 has become an unexpected catalyst for tech adoption globally. A recent report shows that we have vaulted five years forward in consumer and business digital adoption in a matter of around eight weeks of covid. Online activities and transactions are no longer a matter of convenience but a necessity. Banks are launching digital channels so that customers can bank from home, and they can provide extra support to borrowers in distress.

Senior citizens are adopting QR payments and digital banks for the first time. Schools are conducting classes through teleconferences. Grocery stores have shifted to online ordering and delivery. Doctors have begun delivering telemedicine. The list goes on.

As people adapt to a digital lifestyle, so too will they expect the same convenience and seamless experience from other areas of life, including financial services. Fintech has been a buzzword in the world of finance and has significantly shaped various areas, including banking, insurance, and investments.

It also has a unique capability to extend financial inclusion, improve the daily lives of people, and spur growth. Anticipations are that the Fintech domain is to play a very crucial role in a post-COVID-19 world. And, for that to happen, the Fintech industry needs to evolve and adapt to this new scenario.

## 20.6 Challenges of Global Financial Management

Globalisation is the process of international integration arising from the interchange of world views, products, ideas, and other aspects of culture. Put in simple terms, Globalization refers to processes that promote world-wide exchanges of national and cultural resources. Advances in transportation and telecommunications infrastructure, including the rise of the Internet, are major factors in globalization, generating further interdependence of economic, and cultural activities. Globalization is the integration of capital, technology, and information across national borders, in a way that is creating a single global market. Accordingly, the term globalization has four parameters:

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- Permitting free flow of goods by removing or reducing trade barriers between the countries,
- Creating environment for flow of capital between the countries,
- Allowing free flow in technology transfer and
- Creating environment for free movement of labour between the countries of the world.

Thus taking the entire world as global village, all the four components are equally important for attaining a smooth path for globalization. The benefits of globalization for businesses include expanded customer bases, more revenue streams, and a diverse workforce. But globalization also poses some daunting challenges like environmental degradation, legal compliance issues, and worker exploitation.

### **Financial Management**

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

“Financial Management is the Operational Activity of a business that is responsible for obtaining and effectively utilizing the funds necessary for efficient operation.” by Joseph Massie

The basic function of finance Manager is -

- Financing
- Investment
- Dividend and Working Capital Decision

Traditionally the goal of financial management was considered to be profit maximization. However according to modern thinking the goal of financial management is wealth maximization which is consistent with profit maximization.

### **Global Financial Management**

Financial management of a company is a complex process, involving its own methods and procedures. It is made even more complex because of the globalization taking place, which is making the world's financial and commodity markets more and more integrated. The integration is both across countries as well as markets. Not only the markets, but even the companies are becoming international in their operations and approach.

Global financial management is the financial system of operations that determines the health and performance of the world economy. Even a small business owner needs to be conversant with global finance, especially if you do business internationally. Investments at home and abroad can behave differently due to regional and national influences. Understanding the challenges of global finance can help you prepare for those challenges realistically.

The international financial system, which consists of two segments: the official part represented by the accepted code of behavior by governments comprising the international monetary system, and the private part, which consists of international banks and other multinational financial institutions that participate in the international money and capital markets.

The foreign exchange market, which consists of multinational banks, foreign exchange dealers, and organized exchanges where currency futures are regularly traded. The foreign country's environment, consisting of such aspects as the political and socioeconomic systems, and people's cultural values and aspirations. Understanding of the host country's environment is crucial for successful operation and essential for the assessment of the political risk.

### **International Financial Manager**

The international financial manager has the same objective as every other manager in the multinational firm: to maximize the wealth of the stockholders. If the firm's stock price goes up as a result of the manager's decisions, the decisions were good ones. The stockholders would recognize that the value of the company has been enhanced by the managers' efforts. In order to achieve the firm's primary goal of maximizing stockholder wealth, the financial manager performs three major functions: financial planning and control, the efficient allocation of funds, and the acquisition of funds on favorable terms.

The financing function is another such challenge, due to the multiplicity of sources of funds or avenues of investment available to the financial manager. The manager has to worry about the foreign exchange and political risks in positioning funds and in mobilizing cash resources.

This diversity of financial sources enables the MNC at the same time to reduce its cost of capital and maximize the return on its excess cash resources, compared to firms that raise and invest funds in one capital market. This diversity, if properly managed, helps to reduce fluctuations in their earnings and cash flows, which would translate into higher stock market values for their shares. This observation is especially valid for the well-diversified MNCs.

### **New Challenges in Global Financial Management**

Since the 1980s, the world has witnessed a process of unprecedented financial globalization, as illustrated, for example, by the significant increase of capital flows that has occurred both in the advanced and in the emerging economies. In addition, in recent years, along with the acceleration of financial flows, there have been a series of notable changes that force us to think about the challenges that this new phase of financial globalization will bring.

A natural starting point is to consider what the benefits of greater global financial integration are. In general, financial globalization brings important benefits for economic activity. Specifically, in addition to supporting international trade, greater financial openness contributes to making the global allocation of capital more efficient, while also providing opportunities to diversify risks and obtain greater returns. The increase in international trade that has occurred in recent years, therefore, has continued to favor the expansion of financial globalization.

Risk happens on account of uncertainty about happening of an event like loss, damage, variations in foreign exchange rates, interest rate variations, etc. Credit risk, liquidity risk, asset-backed risk, foreign investment risk, equity risk, and currency risk are all common forms of financial risk. Crises like the 2008 global financial crash and the COVID-19 pandemic have highlighted some of the weaknesses and vulnerabilities inherent to a global financial system. Many innovations have introduced complexity in the way financial globalization operates.

### **Diverse Economic Environment**

Operating in a globalized environment means being answerable to different countries with different political environments and cultural norms, as well as trade procedures and tax conditions to comply with. In addition, the credit conditions may be totally different from what they are domestically. Anticipate day-to-day financial management challenges when operating internationally and devise ways to maintain healthy equilibrium within this economic framework to ensure your business's continued growth and survival.

### **Risk Management Challenges**

Risk management is a major challenge of global financial management. For example, if you're buying supplies or selling products overseas, your business may face the risk of high prices caused by inflation in emerging economies.

Although vulnerability to financial crises in many emerging markets has been reduced significantly due to stronger balance sheets, better fiscal policies and more flexible exchange rate regimes, other factors still pose risks.

### **Dynamic Foreign Exchange Rates**

If you need part of your financing for projects in emerging economies where you conduct your business, fluctuating exchange rates can subject you to higher interest rates. You have to monitor the foreign exchange market closely for suitable rates that benefit your organization.

### **Banking Regulations**

Unlike financial management in a single country, global financial management must deal with many other banking institutions that have problems of their own. Some multilateral development banks, such as the International Monetary Fund and World Bank, have been set up to regulate international economic affairs in emerging economies and typically give conditions to various countries and their banks. This can be a challenge when doing business in a country where these institutions have influence, since they advise banks in such countries to avoid testing waters in the riskier markets in its structural adjustment programs.

### **Question on Sharpe Index**

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Use the Sharpe ratio to see which one is performing better?

Investment #1

Portfolio return: 20%

Risk free rate: 10%

Standard Deviation: 5

Investment #2

Portfolio return: 30%

Risk free rate: 10%

Standard Deviation: 40

Solution

Sharpe Ratios

Investment #1: 2

Investment #2: .5

As you can see, investment #2 out performed investment #1 by a rate of 50 percent, but this doesn't mean that investment #2 performed well relative to its risk level. The sharpe ratio tells us that the first investment actually performed better than the second relative to the risk involved in the investment. If the second investment performed as well as the first investment relative to risk, it would have earned a return of 90 percent.

The second investment may have earned a higher return this year, but it has a higher risk and likelihood of volatility in the future.

### Question on Sharpe Index

Fund	Average Return	Standard deviation
A	0.0879	0.0829
B	0.1347	0.1982
G-Bonds	0.05	

### Solution

- $St = .0879 - .05 / .0829 = .457$
- $St = .1347 - .05 / .1982 = .427$

So Portfolio A is ranked as better fund Even though Portfolio B has greater return of 13 and the reason is Fund B manager took greater risk to earn higher return.

### Question on Beta

E plc is evaluating a project which has a beta value of 1.5. The return on the FTSE All-Share Index is 15%. The return on treasury bills is 5%.

Required:

What is the cost of equity?

Solution

- $5\% + (15\% - 5\%) 1.5 = 20\%$

### Question on Beta & Alpha



Unit 20: Contemporary Issues

We are considering investing in F plc or G plc. Their beta values and expected returns are as follows:

Beta values	Expected returns
F plc 1.5	18%
G plc 1.1	18%

The market return is 15% and the risk-free return is 5%.

What investment advice would you give us?

Solution

Alpha table

Expected returns    Required returns

Alpha values F plc 18%

$$5\% + (15\% - 5\%) \quad -2\%$$

$$1.5 = 20\%$$

G plc 18%                     $5\% + (15\% - 5\%) \quad +2\%$

$$1.1 = 16\%$$

Sell shares in F plc as the expected return does not compensate the investors for its perceived level of systematic risk, it has a negative alpha. Buy shares in G plc as the expected return more than compensates the investors for its perceived level of systematic risk, ie it has a positive alpha.

### Question on Beta & Alpha

The expected return of the portfolio A + B is 20%. The return on the market is 15% and the risk-free rate is 6%. 80% of your funds are invested in A plc and the balance is invested in B plc. The beta of A is 1.6 and the beta of B is 1.1.

Required:

Prepare the alpha table for the Portfolio (A + B)

Solution

$$b(A + B) = (1.6 \times .80) + (1.1 \times .20) = 1.5$$

$$R \text{ portfolio } (A + B) = 6\% + (15\% - 6\%) 1.5 = 19.50\%$$

Alpha table

Expected return	Required return	Alpha value
Portfolio (A + B) 20%	19.50%	0.50%

The Alpha Value

If the CAPM is a realistic model (that is, it correctly reflects the risk-return relationship) and the stock market is efficient (at least weak and semi-strong), then the alpha values reflect a temporary abnormal return. In an efficient market, the expected and required returns are equal, ie a zero alpha. Investors are exactly compensated for the level of perceived systematic risk in an investment,

ie shares are fairly priced. Arbitrage profit taking would ensure that any existing alpha values would be on a journey towards zero.

#### Question on NPV

Company A ltd wanted to know their net present value of cash flow if they invest 100000 today. And their initial investment in the project is 80000 for the 3 years of time, and they are expecting the rate of return is 10 % yearly. From the above available information, calculate the NPV.

Solution

- $NPV = \text{Cash flows} / (1 - i)^t - \text{Initial investment}$
- $= 100000 / (1 - 10)^3 - 80000$
- $NPV = 57174.21$
- So in this example, NPV is positive, so we can accept the project.

#### Question on NPV

Maruti is in the business of auto and ancillary, and they want to start their subsidiary business as an expansion plan for assembling the auto part, so they had provided the below information for calculating the NPV. They want to know should this project will be feasible or not.

- Cost of equity - 35%
- Cost of debt - 15%
- The weight of equity - 20%
- The weight of debt - 80 %
- Tax rate - 32%

Cash flow is given below for 7 year

- 2010 = -12000
- 2011 = 10000
- 2012 = 11000
- 2013 = 12000
- 2014 = 13000
- 2015 = 14000
- 2016 = 15000

Find the NPV with the help of WACC.

Solution

WACC formula

$$= W_e * C_e + W_d * C_d * (1 - \text{tax rate})$$

$$= 20 * 35 + 80 * 15 * (1 - 32)$$

$$WACC = 15.16\%$$

Calculation of NPV can be done as follows,

## Unit 20: Contemporary Issues

Cash Flows	2010	2011	2012	2013	2014	2015	2016
	-12000	10000	11000	12000	13000	14000	15000
WACC	15.16%						
NPV	29151.0						

NPV = 29151.0

We are getting a positive net present value of future cash flows, so in this example also we will accept the project.

### Question on NPV

Toyota wants to set up one new plant for expansion of current business, so they want to check the feasibility of the project.

Toyota had provided the following information regarding cash flows and WACC. Cash flow during the period is as follows.

2008 = -4000

2009 = -5000

2010 = 6000

2011 = 7000

2012 = 9000

2013 = 1200

Solution

Calculation of NPV can be done as follows,

Cash Flows		2008	2009	2010	2011	2012	2013
		-4000	-5000	6000	7000	9000	12000
WACC	12%						
NPV	12348.33						

NPV = 12348.33

As NPV is positive we should accept the project.

### Question on NPV

A project requires an initial investment of \$225,000 and is expected to generate the following net cash inflows:

- Year 1: \$95,000
- Year 2: \$80,000
- Year 3: \$60,000
- Year 4: \$55,000

Compute net present value of the project if the minimum desired rate of return is 12%.

Solution

Year	Present value of \$1 at 12%	Cash flow	Present value of cash flow
1	0.893*	\$95,000	\$ 84,835
2	0.797	80,000	63,760
3	0.712	60,000	42,720
4	0.636	55,000	34,980
Total			\$ 226,295
Initial investment			(225,000)
Net present value			\$ 1,295

The project seems attractive because its net present value is positive.

**Question on CAPM**

An investor is contemplating a stock worth \$100 per share today that pays a 3% annual dividend. The stock has a beta compared to the market of 1.3, which means it is riskier than a market portfolio. Also, assume that the risk-free rate is 3% and this investor expects the market to rise in value by 8% per year.

Solution

The expected return of the stock based on the CAPM formula is :

$$\text{Return on Asset} = \text{RF} + \text{BETA}(\text{RM} - \text{RF})$$

$$9.5\% = 3\% + 1.3 \times (8\% - 3\%)$$

**Question on CAPM**

The beta for Pan Am's stock was estimated by Value Line to be 0.95 in 2020. Long-term government bond rates were about 12 percent in November 2020. Thus the required rate of return on Pan Am's stock in November 2020 was if risk premium is 6%.

Solution

- Required Rate = 12% + 6% \* 0.95 = 17.7 %
- $\text{RF} + \text{BETA}(\text{RM} - \text{RF}) = 17.7\%$

**Question on CAPM**

Suppose a company uses only debt and internal equity to finance its capital budget and uses CAPM to compute its cost of equity. Company estimates that its WACC is 12%. The capital structure is 75% debt and 25% internal equity.

Before tax cost of debt is 12.5 % and tax rate is 20%. Risk free rate is  $r_{RF} = 6\%$  and market risk premium ( $r_m - r_{RF}$ ) = 8%: What is the beta of the company?

Solution

$$\% re = 18\% = rRF + \beta (r_m - rRF)$$

$$18\% = 6\% + \beta(8\%) \Rightarrow \beta = 1.5$$

#### Question on Bid ask spread

Consider a retail forex trader who buys €100,000 on margin. The current quote in the market is €1 = \$1.3300 / 1.3302. Find the bid-ask spread.

Solution

$$\text{Spread} = \frac{\text{Ask} - \text{Bid}}{\text{Ask price}} \times 100$$

$$= \frac{0.0002}{1.3302} \times 100$$

$$= 0.015\%$$

#### Question on Working Capital

Suppose Current Ratio is 4 : 1. NWC is Rs.30,000/-. What is the amount of Current Assets ?

Solution

$$4a - 1a = 30,000$$

Therefore  $a = 10,000$  i.e. Current Liabilities is Rs.10,000

Hence Current Assets would be  $4a = 4 \times 10,000 = \text{Rs.}40,000/-$

#### Question on Working Capital

From the following financial statement calculate

Current Ratio (ii) Acid test Ratio

Sales	1500	Inventories	125
Cost of sales	1000	Debtors	250
Gross profit	500	Cash	225
		C. Liabilities	
		Trade Creditors	200

Solution

$$\text{Current Ratio} : 600/200 = 3 : 1$$

$$\text{(ii) Acid Test Ratio} : \frac{\text{Debtors} + \text{Cash}}{\text{Trade creditors}} = \frac{475}{200} = 2.4 : 1$$

#### Question on Cash conversion cycle

A company makes widgets in warehouse for 12 days which takes 17 days to collect on the sale of each widget and takes 15 days to pay invoices to company vendors. Calculate cash conversion cycle?

Solution

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We can calculate the Net Operating Cycle using the given formula.

Net Operating Cycle = Days Inventory Outstanding + Days Sales Outstanding - Days Payables Outstanding

Substituting the values in the formula,

Net Operating Cycle =  $12 + 17 - 15 = 14$  days Therefore, Company generates cash from its assets within 14 days.

**Question on currency trading**

On 15th January Mr. Arvind Sethi bought a January USDINR futures contract which cost him Rs.43,000. Each USDINR futures contract is for delivery of USD1000. The RBI reference rate for final settlement was fixed as 42.90. How much profit/loss did he make?

Solution

Mr. Arvind Sethi bought a January USDINR futures contract which cost him Rs.43,000

On the date of settlement is 42.90

So the loss is .10

Total loss is 1000 in quantity  $\times .10 = 100$

**Question on currency trading**

For a USDINR Currency Futures contract at the NSE, the previous day's settlement price is Rs.40.0000 and today's settlement price is Rs.41.0000. An investor's Sell position of 50 contracts is brought forward from the previous day. What will be his market to market settlement value?

Solution

On contract quantity is 1000

An investor's Sell position of 50 contracts

Currency is sold at Rs.40.0000 and closing is at Rs.41.0000.

So there is loss of Rs.1

Total loss is  $10 \times 50 \text{ contract} \times 1000 = 50,000$

**Question on Call option**

Mr. A buys a Call on an index (such as Nifty 50) with a strike price of Rs. 2000 for premium of Rs. 81. Consider the values of the index at expiration as 1800, 1900, 2100, and 2200.

Solution

For calculating profit an loss- $ST = \text{Spot price at time T}$      $K = \text{Strike price}$      $C = \text{Premium}$

The payout in two scenarios is as follows:

Profit/Loss =  $-c$ , if  $S T = K$

Profit/Loss =  $(ST - K) - c$  if  $S T > K$

- For  $ST = 1800$ , Profit/Loss =  $0 - 81 = - 81$  (maximum loss = premium paid)
- For  $ST = 1900$ , Profit/Loss =  $0 - 81 = - 81$  (maximum loss = premium paid)

- For  $ST = 2100$ , Profit/Loss =  $2100 - 2000 - 81 = 19$
- For  $ST = 2200$ , Profit/Loss =  $2200 - 2000 - 81 = 119$

As we can see from the example, the maximum loss suffered by the buyer of the Call option is Rs. 81, which is the premium that he paid to buy the option. His maximum profits are unlimited and they depend on where the underlying price moves.

### Question on Put option

Mr. X buys a put at a strike price of Rs. 2000 for a premium of Rs. 79. Consider the values of the index at expiration at 1800, 1900, 2100, and 2200.

### Solution

For calculating profit and loss- $ST =$  Spot price at time T     $K =$  Strike price     $C =$  Premium

The payout in two scenarios is as follows:

Profit/Loss =  $-c$ , if  $S \leq K$

Profit/Loss =  $(K - S) - c$  if  $S > K$

For  $ST = 1800$ , Profit/Loss =  $2000 - 1800 - 79 = 121$

For  $ST = 1900$ , Profit/Loss =  $2000 - 1900 - 79 = 21$

For  $ST = 2100$ , Profit/Loss =  $-79$  (maximum loss is the premium paid)

For  $ST = 2200$ , Profit/Loss =  $-79$  (maximum loss is the premium paid)

As we can see from the example, the maximum loss suffered by the buyer of the Put option is Rs. 79, which is the premium that he paid to buy the option. His maximum profits are unlimited and depend on where the underlying price moves.

### Question on Intrinsic value in call option

A stock is selling for \$60 a share, its call option with exercise price \$55 is selling for \$8. Find its intrinsic value and time value.

Solution

Intrinsic value of a call option =  $S - X$ , if  $S > X$

and  $= 0$ , if  $S < X$

These two equations as a single equation, Intrinsic value of a call =  $\max [S - X, 0]$

Here it is then the intrinsic value of the call is \$5 and the time value \$3.

### Summary

Derivatives are the financial instrument whose value depends on another instrument. It is used as a risk management tool in which participants shift risk to another who wants to take. The participants in derivative market are hedgers, speculators and arbitrageurs. The financial crisis is a situation in which asset prices see a steep decline in value, businesses and consumers are unable to pay their debts, and financial institutions experience liquidity shortages. There are banking crises, currency crises and speculative bubbles and crashes..

Oil prices are the important segment in currency value. Fintech refers to any business that uses technology to enhance or automate financial services and processes. Globalization is a process that promotes world-wide exchanges of national and cultural resources. Globalisation has many advantages but it also poses challenges.

**Keywords**

**Banking Crisis:** It is a situation in which bank withdrawals are more than deposits and bank finds itself difficult to pay quickly the deposits.

**Currency Crises:** It is a situation in which the participants acts in a way which forces a devaluation or value of currency decreases.

**Fintech:** It is situation in which business uses technology to enhance or automate financial services and processes.

**Foreign-Exchange Reserves:** Foreign-exchange reserves is foreign-currency deposits held by national central banks and monetary authorities.

**Self Assessment**

1. Operators, who want to transfer a risk component of their portfolio.
  - A. Hedgers
  - B. Speculators
  - C. Both of the above
  - D. Not Applicable
  
2. An investor may purchase a derivative contract whose value moves in the ----- to the value of an asset the investor owns.
  - A. Same direction
  - B. Opposite direction
  - C. Both of the above
  - D. Not Applicable
  
3. -----have a pre-existing risk exposure that leads them to use futures transactions as a substitute for a cash market transaction. By doing so, they are able to reduce or eliminate their risk.
  - A. Hedgers
  - B. Speculators
  - C. Arbitrageurs
  - D. Not Applicable
  
4. Which of the following is False
  - A. Derivatives assist in improving the efficiency of the markets, by providing a self-correcting mechanism.
  - B. One of the primary functions of derivatives markets is price discovery.
  - C. Spot Market is same as from derivative market.
  - D. A derivative is a financial instrument whose return is derived from the return on its other instrument
  
5. A person selects a shirt in a shop and agrees on a price, the settlement (exchange of funds for goods) takes place immediately. This is an example of-----
  - A. Spot market
  - B. Derivative market



- C. Red market
- D. None of the above

6. ----- is a situation when the participants in an exchange market come to recognize that a pegged exchange rate is about to fail, causing speculation against the peg that hastens the failure and forces a devaluation.

- A. Red crises
- B. Banking crises
- C. Currency crisis
- D. None of the above

7. An event in which bank runs are widespread is called a systemic -----

- A. Red crises
- B. Banking crises
- C. Currency crisis
- D. None of the above

8. A -----exists in the event of large, sustained overpricing of some class of assets.

- A. Bank run
- B. Currency crises
- C. Speculative bubble
- D. None of the above

9. Derivatives are among the most financial instruments.

- A. Complex
- B. Simple
- C. Both
- D. Not Applicable

10 One of the most apparent correlations between currency prices and oil can be seen in countries that produce and export oil which can experience on high oil prices, meaning that a collapse can have the effect of -----of their national currency..

- A. Increasing the value
- B. Eroding the value
- C. No change
- D. None of the above

11. It is analyzed that due to higher interest prevailing in an economy will generate -----  
-----deposits from investors and thus higher return to lenders as well.

- A. Higher deposits
- B. Lower deposits
- C. No impact
- D. Credit risk

International Financial Management

12. The derivatives derive its value from the performance of the underlying asset. It may be shares, debentures, tangible commodities, currencies, indices or long term or short term securities.
- A. True  
B. False
13. . Derivatives provide an opportunity to transfer risk, from the one who wish to avoid it; to one, who wish to accept it.
- A. True  
B. False
- 14 Globalization is the integration of capital, technology, and information across national borders, in a way that is creating a single global market.
- A. True  
B. False
15. Traditionally the goal of financial management was considered to be wealth maximization. However according to modern thinking the goal of financial management is profit maximization.
- A. True  
B. False

**Answers for Self Assessment**

- |       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 1. A  | 2. B  | 3. A  | 4. C  | 5. A  |
| 6. C  | 7. B  | 8. C  | 9. A  | 10. B |
| 11. A | 12. A | 13. A | 14. A | 15. B |

**Review Questions**

- 1) What do you mean by financial crises?
- 2) Enumerate the various types of financial crises.
- 3) Explain in detail about meaning and scope of fintech..
- 4) Elaborate the challenges of global financial management?

**Further Readings**

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Shapiro Allan C, Multinational Financial Management, Prentice Hall, New Delhi.

**Web Links**

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