BALAJI INSTITUTE OF I.T AND MANAGEMENT KADAPA

INTERNATIONAL FINANCIAL MANAGEMENT (17E00407)

ICET CODE: BIMK

2nd Internal Exam Syllabus

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Units covered : 2. 5 to 5 Units (2nd Internal Syllabus)

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Syllabus

(17E00407)INTERNATIONAL FINANCIAL MANAGEMENT

(Elective VI)

Objective: The objective of the course is to provide students with a broad view of International Monetary Systems and its understanding to enable a global manager to do business in a global setting. The prerequisite for the course is Financial Accounting and Analysis and Financial Management.

1. **Introduction to International Financial management:** IFM meaning**,** Difference between FM & IFM, Nature ,Scope, Importance.
2. Foreign Exchange Market: Functions and Structure of the Forex markets, major participants, types of transactions and settlements, Foreign exchange quotations, .
3. **Management of foreign exchange exposure and risk: Types of Exposure, Economic Exposure, Transaction Exposure, Operating Exposure.**
4. **Cross-border Investment Decisions:** Capital budgeting, Approaches to Project Evaluation, Risk in Cross-border Investment Decisions.
5. **Financing Decisions of MNC`s & Working Capital Management:** Introduction, the cost of capital, capital structure, Cash management, management of receivables, Inventory management.

Text Books:

- International Financial Management, V.K.Bhalla ,S.Chand
- International Financial Managemen, EphriamClark ,Cengage.

References:

- International Finance , Prakash .G.Apte, TMH
- International Financial Management, T.Siddaiah: Pearson.
- International Financial Management ,M.K.Rastogi
- International Financial Management, S.EunChoel and Risnick Bruce: TMH.
- International Financial Management, MachiRaju, HPH.
- international finance management, Jeff Madura, Cengage.
- International Financial Management, Sharan5th Edition, PHI.
- International Financial Management, MadhuVij: Excel, .
- International Financial Management, V. A Avadhani, Himalaya .

UNIT-3

MANAGEMENT OF FOREIGN EXCHANGE EXPOSURE AND RISK

1.3 MEASUREMENT OF ECONOMIC/OPERATING EXPOSURE

The degree of opera5ting exposure to exchange rate fluctuations is significantly higher for a firm involved in international business than for a purely domestic firm. Assessing the operating exposure of MNCs is difficult due to the complex interaction of funds that flow into out of and within the MNCs operating exposure is crucial to operations of the firm in the long run. If an MNC has subsidiaries around the world each subsidiary will be affected differently by fluctuations in currencies. Thus attempts by the MNCs to measure its economic exposure would be extremely complex.

One m4ethod of measuring a MNCs operating exposure is to classify the cash flows into different items on the income statement and predict movement of each item in the income statement based on a forecast of exchange rates. This will help in developing an alternative exchange rate scenario and the forecasts for the income statement items can be revised. By assessing how the earnings forecast in the income statement has changed in response to alternative exchange rate scenarios the firm can assess the influence of currency movements on earnings and cash flows.

Currency risk or uncertainty which represents random changes in exchange rates is not the same as the currency exposure which measures what is at risk. Under certain conditions a firm may not face any exposure at all i.e. nothing is at risk even if the exchange rates change randomly. The British asset your company owns has an embedded hedge against exchange risk rendering the dollar price of the assets insensitive to exchange rate changes.

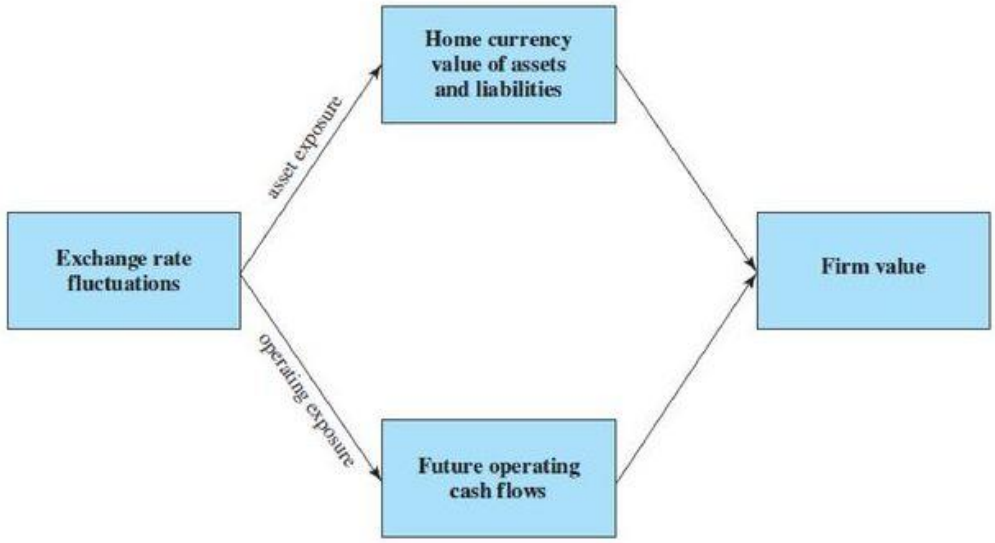

Figure:1 channels of operating exposure

Consider an alternative situation in which the local price of your company's British asset barely changes. In this case the dollar value of the asset will be highly sensitive to the exchange rate since the former will change as the latter does. To the extent that the dollar price of the British asset exhibits sensitivity to exchange rate movements your company is exposed to currency risk. Similarly if the businessman company's operating cash flows are sensitive to exchange rate changes the company is again exposed to currently risk.

Exposure to currency risk thus can be properly measured by the sensitivities of,

a. The future home currency values of the firm's assets (and liabilities) and
b. The firms operating cash flows to random changes in exchange rates.

1.3.1 MANAGEMENT OF FOREIGN EXCHANGE EXPOSURE AND RISK

Many methods area available to cover or hedge exposure to risk. Measurement and management of foreign exchange risk/exposure are as follows.

Management of transaction exposure
Management of economic/operating Exposure
Management of translation exposure

1.4 MANAGEMENT OF TRANSACTION EXPOSURE

In the event of company chooses to manage/eliminate transaction exposure there are a variety of hedging strategies available if the transaction will take place in less than one year. Companies would up well to price or evaluate the costs of several techniques in order to make an optimum choice.

There are two methods available to firm to hedge its transaction exposure which is discussed below.

Management of transaction exposure

Natural hedges	contractual hedges
Netting	Forward market hedging
Leading and lagging	Future market hedging
Cross-hedging	Options market hedging
Risk-sharing	Swaps market hedging
Pricing of transactions	Money market hedging
Parallel loans	Invoicing /billing in desired currency.

1. Assume that FASB 8 is still in effect instead of FASB 52. Construct a translation exposure report for Centralia Corporation and its affiliates that is the counterpart to Exhibit 10.6 in the text. Centralia and its affiliates carry inventory and fixed assets on the books at historical values.

Solution: The following table provides a translation exposure report for Centralia Corporation and its affiliates under FASB 8, which is essentially the temporal method of translation. The difference between the new report and Exhibit 10.6 is that nonmonetary accounts such as inventory and fixed assets are translated at the historical exchange rate if they are carried at historical costs. Thus, these accounts will not change values when exchange rates change and they do not create translation exposure. Examination of the table indicates that under FASB 8 there is negative net exposure for the Mexican peso and the euro, whereas under FASB 52 the net exposure for these currencies is positive. There is no change in net exposure for the Canadian dollar and the Swiss franc. Consequently, if the euro depreciates against the dollar from €1.1000/$1.00 to €1.1786/$1.00, as the text example

assumed, exposed assets will now fall in value by a smaller amount than exposed liabilities, instead of vice versa. The associated reporting currency imbalance will be $239,415, calculated as follows:

Reporting Currency Imbalance= - €3,949, 0000 €3, 949, 0000/

——————— - ——————— =$239,415.

/€1.1786 / $1.00 - €1.1000 / $1.00

Translation Exposure Report under FASB 8 for Centralia Corporation and its Mexican and Spanish Affiliates, December 31, 2008 (in 000 Currency Units)

	Canadian Dollar	Mexican Peso	Euro	Swiss Franc
Assets				
Cash	CD200	Ps 6,000	€ 825	SF 0
Accounts receivable	0	9,000	1,045	0
Inventory	0	0	0	0
Net fixed assets	0	0	0	0
Exposed assets	CD200	Ps15,000	€ 1,870	SF 0
Liabilities				
Accounts payable	CD 0	Ps 7,000	€ 1,364	SF 0
Notes payable	0	17,000	935	1,400
Long-term debt	0	27,000	3,520	0
Exposed liabilities	CD 0	Ps51,000	€ 5,819	SF1,400
Net exposure	CD200	(Ps36,000)	(€3,949)	(SF1,400)

UNIT-3-AFTER 2.5 UNITS-IMPORTANT QUESTIONS

1. **Discuss in detail the significance of theory of purchasing power parity in determining the rate of exchange.**
2. **Give a light on various exchange rate regimes and Central Bank interventions in exchange rates.**
3. **Differentiate among Economic, Operating and Transaction exposures in foreign exchange market.**
4. **What type of exchange exposures is a multinational enterprise subjected to.**

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UNIT-4

CROSS-BORDER INVESTMENT DECISIONS

1.1 INTRODUCTION TO CAPITAL BUDGETTING

The decision to invest abroad takes a concrete share when a figure project is evaluated in order to ascertain whether the implementation of the project is going to add to the value of the investing company. The evaluation of the long term investment project is known as capital budgeting. The technique of capital budgeting is almost similar between a domestic company and an international appear in the case of international capital budgeting. These complexities influence the computation of the cash flow and the required rate of return.

A MNCs decision to invest abroad which is often based on strategic economic or behavioral motives may be defensive or aggressive aiming at strengthening the company position. Although the decision to invest abroad may be taken for non-financial reasons it is imperative that the underlying project is financially viable because the MNC will not otherwise service in the long run. Capital budgeting also called investment appraisal and project evacuation is used for evaluating the financial viability of a project.

1.1.1 CONCEPT OF INTERNATIONAL CAPITAL BUDGETING

Capital budgeting for multinational firms uses the same framework as domestic capital budgeting. However multinational firms engaged in evaluating foreign projects face a number of complexities many of which are not there in the domestic capital budgeting process.

International capital budgeting is more complicated than domestic capital budgeting because of MNCs are typically large and capital intensive and because the process involves a larger number of parameters and decision variables. In general international capital budgeting involves a consideration of more risk than domestic capital budgeting. But like domestic capital budgeting international capital budgeting involves the estimation of some measures or criteria that indicate the feasibility or otherwise of a project such as the net present value.

However certain factors that are not considered in domestic capital budgeting should be taken into account in international capital budgeting because of the special nature of FDI projects.

The estimate of NPV and similar criteria requires

a. The identification of the relevant expected cash flows to be used for the analysis of the proposed project and

b. The determination of the proper discount rate for finding the present value of the cash flow.

1.1.2 FACTORS AFFECTING INTERNATIONAL CAPITAL BUDGETING

1. **BLOCKED FUNDS**: if funds are blocked or otherwise restricted can be utilized in a foreign investment the capital cost of the investor may be below the local project construction costs. From the investors perspective there is a gain from activated funds equal to the difference between the face value of these funds and the present's value of funds if the next best thing is done with them. This gain should be deducted from the capital cost of the project to find the cost from the investor perspective.
2. **AMENITIES AND CONCESSIONS GRANTED BY HOST COUNTRIES**: while government do offer special financial aid or other kinds of help for certain domestic projects it is very common for foreign investments to carry sort of assistance. However with the APV technique we can add a separate term to include the subsidy.
3. **DIFFERING RATES OF NATIONAL INFLATION:** Long-term inflation rates different rates of national inflation and their potential effect on competiveness most be considered. Inflation will have the following effects on the value of the project.
   a. It will impact the local operating cash flows both in terms of the prices of inputs and outputs, and also in terms of the sales volume depending on the price elasticity of the product.
   b. It will impact the parents cash flow by affecting the foreign exchange rates and
   c. It will affect the real cost of financing choices between foreign and domestic sources of capital.
4. **POLIRICAL RISK INVOLVED IN FOREIGN INVESTMENT:** political risk this is another factor that can significantly impact the viability and profitability of foreign projects. This can affect the future cash flows of a project in that country in a variety of ways. Political development may also affect the life and the terminals value of foreign investment.
5. **EXCHANGE RATE FLUCTUATIONS:** foreign currency fluctuations another added complexity in multinational capital budgeting is the significant of effect that fluctuating exchange rates can have on the prospective cash flows generated by the

investment. From the parents perspective future cash flows abroad have value only in terms of the exchange rate at the date of repatriation.

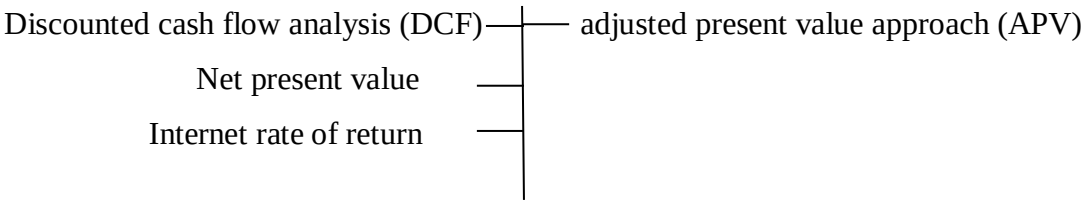
6. **SUBSIDIZED FINANCING**: in order to attract foreign investments in key sectors the governments of developing economies generally provide support in the form of subsidy. Likewise international agencies entrusted with the responsibility of promoting cross border trade sometimes offer financing at below market rates.
7. **LOST EXPORTS**: another factor affecting the international capital budgeting is the issue of lost exports arising out of engaging in a project abroad. Profits form lost exports represent a reduction from the cash flows generated by foreign project for each year of is duration. This download adjustment in cash flows may be total partial or nil depending upon whether the project will replace projected exports or none of them.
8. **INTERNATIONAL DIVERSIFICATION BENEFITS:** dispersal of investment in a number of countries is likely to produce diversification benefits to the parent company's shareholders. However it would be difficult to quantify such benefits as can be allocated to a particular project.
9. **HOST GOVERNMENT INCENTIVES**: if the most government offers incentives they should be included in the capital budgeting decisions. For example if the host government offers tax incentives or provides loans at subsidized rates the amount of gain on this account should be added to the operating cash flows.
10. **DIFFICULTY IN ESTIMATING TERMINAL VALUE OF FOREIGN PROJECTS:** terminal values while terminal values of long term projects are difficult to estimate even in the domestic context they become far more difficult in the multinational context due to the added complexity from some of the factors discussed above. An added dimension is that potential acquires may have widely divergent perspectives' on their value of acquiring the terminal assets.

1.2 APPROACHES TO PROJECT EVALUATION

The fundamental goal of the financial manager is to maximize shareholders wealth. Shareholders wealth is maximized when the firm out of a list of prospective investments selects a combination of those projects that maximize the company's value to its shareholders. This selection process requires the financial manager to discount the project cash flows at the firms weighted average cost of capital or the projects required rate of return

to determine the net present value. There are several methods through which the projects can be evaluated in capital budgeting like payback period internal rate of return profitability index but finance managers generally believe that the criteria of net present value is the most appropriate in capital budgeting since it will help the company to select only those investments which maximize the wealth of the shareholders. The methods of capital of capital budgeting is as follows.

Approaches to project evaluation



I.DISCOUNTED CASH FLOW ANALYSIS (DCF)

Discounted cash flow technique involves the use of the time value of money principle to project evaluation. The two most widely used criteria of the discounted cash flow technique are the net present value (NPV) and the internal rate of return (IRR). Both the techniques discount the projects cash flow at an appropriate discount rate. The results are then used to evaluate the projects based on two acceptance/rejection criteria developed by management.

1. **NET PRESENT VALUE (NPV)**

   NPV is the most popular method and is defined as the present value of future cash flows discounted at an appropriate rate minus the initial net cash outlay for the projects. The discount rate used here is known as the cost of capital. The decision criterion is to accept projects with a positive NPV and reject projects which have a negative NPV.

   The NPV can be defined as follows.

   $$NPV = I0 + \sum_{t=1}^{n} \frac{CF_t}{(I+k)^t}$$

   Where,

   I0 = initial cash investment

   CF_t= expected after – tax cash flows in year t.

   K= weighted average cost of capital

   n= life span of the project.

The NPV of a project is the present value of all cash inflows including those at the end of the projects life minus the present value of all cash outflows.

The decision criteria is to accept a project if NPV>0 and to reject if NPV <0

For example, to set the stage let us assume that you are trying to decide whether to undertake one of two projects. Project A involves buying expensive machinery that produces a better product at a lower cost. The machines for project A cost 1.000 and if purchased your anticipate that the project with produce cash flows of 500 per year for the next five years. Projects B's machines are cheaper costing 800 but they produce smaller annual cash flows of 420 per for the next five years. We will assume that the correct discount rate is 12%

Suppose we reply the NPC criterion to project A and B

Year	**Two projects**	
	Project A	**Project B**
0	-1,00	-800
1	500	420
2	500	420
3	500	420
4	500	420
5	500	420
NPV	802.39	714.01

Discount rate – 12%

Both projects are worthwhile since each has a positive NPV. If we have to choose between the projects then project A is preferred to project B because it has the higher NPV.

Example, a project involves initial investment for 5, 00,000. The net cash inflow during the first second and the third year is expected respectively 3, 00,000 and 2, 00,000.At the end of the year the scrap value is indicated at 1,00,000. The risk-adjusted discount rate is 10%. Calculate NPV.

Solution: = t1+t2+t3 – I0

$$= \frac{3,000,000}{1.10} + \frac{2,00,000}{(1.10)2} + \frac{1,00,000}{(1.10)3} - 5,000,000$$

= 2,873,778

Project would be accepted because NPV is positive.

2. **INTERNATIONAL RATE OF RETURN** (IRR): IRR is calculated by solving for r in the following equation.

$$\sum_{t=1}^{n} \frac{CFt}{(I+r)} - I0=0$$

Where r is the internal rate of return of the project

The IRR method finds the discount rate which equates the present value of the cash flows generated by the project with the initial investment or the rate which would equate the present value of all cash flows to zero.

To illustrate this technique the study assumes a firm is considering investing in a project that has the following cash flows.

Year (t)	**Expected after-tax net cash flows, CF |$**
0	(5.000)
1	800
2	900
3	1.500
4	1.200
5	3.200

CF = (5,000) represents the net cost or initial investment that is required to purchase the asset the parentheses indicate that the cash flows is negative.

The IRR for above project is.

IRR = 12.5%

A project is acceptable using IRR if its IRR is greater than the firms required rate of return i.e. IRR > r. Remembers that the IRR represents the rate of return the firm will earn if the project is purchased. So simply stated the project must earn a return that is greater than the cost of the funds used to purchase it. In the example IRR =12.5% which is greater than r=12%, so the project is acceptable.

3. ADJUSTAED PRESENT VALUE APPROACH (APV)

The APV approach is a value additively approach to capital budgeting i.e. each cash flow as a source of value is considered individually. Also in the APV approach each cash flow is discounted at a rate of discount consistent with the risk inherent in that cash flow. In equation form the APV approach can be written as.

APV

Where the term I0 = present value of investment outlay.

$$\frac{X_t}{(1+k^*)^t} = \text{present value of operating cash flows}$$

$$\frac{T_t}{(1+id)^t} = \text{present value of interest tax shields}$$

$$\frac{S_t}{(1+id)^t} = \text{present value of interest subsidies}$$

The various symbols denote

Tt = tax savings in year t due to financial mix adopted

St = before tax value of interest subsidies (on the home currency) in year t due to project specific financing.

Id = before tax cost of dollar debt (home currency)

Example, A project costing 50 million is expected to generate after tax cash flows of 10 million a year forever. Risk free rate is 3% asset beta is 1.5 required return on market is 12% cost of debt is 8% annual interest costs related to project are 2 million and tax rate is 40%. Calculated the adjusted present value of the project.

Solution

Adjusted present = present value of cash flows + present value of value tax savings.

We need to find unearned cost of equity which is 3% + 1.5* (12% - 3%) = 16.5%. using this rate other present value of cash flows = 10 million/0.165=60.61 million. Initial investment is

50 million no net present value of future cash flows using unearned cost of equity is 10.61 million (60.61 million + 50 million.)

Present value of tax savings = 2 million 0.4/0.08 =10 million adjusted

Present = present value of cash flows + present value of tax savings

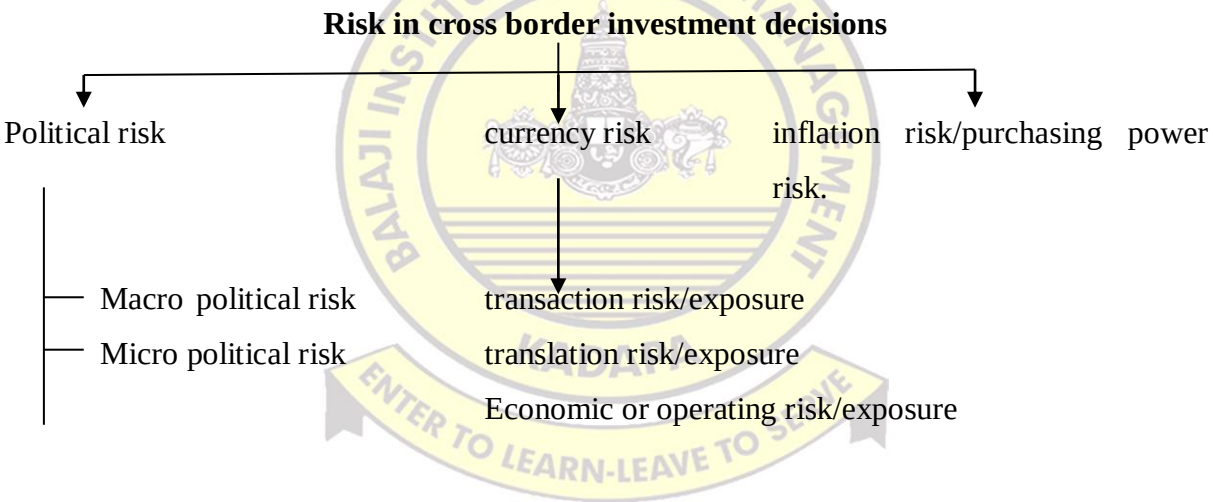
= 10.61 million + 10 million = 20.61 million.

Decision rule

The decision rule for adjusted present value is the same as net present value – accept positive APV projects and reject negative APV projects. The project discussed in the example has an APV of 20.61 which is positive hence the company should undertake the project.

1.3 RISKS IN CROSS-BORDER INVESTMENT DECISIONS

Following are the various types of risks cross-border investment decisions.



I. POLITICAL RISK

Political risk is defined as the whole of decisions conditions or events of political nature able to trigger directly or indirectly a financial loss or a physical damage for an investment project. In other words this is the risk of incurring losses when investing in a foreign country as a result of changes in the country political structure or policies such as tax laws tariffs expropriation of assets restrictions in repatriation of profits or episodes of political violence.

Following are the types of political risk.

1. **Macro political risk:** macro risk is a type of political risk company's face when conducting operations in foreign countries. Macro risk refers to adverse actions that will affect firms such as expropriation or insurrection. A macro political risk affects all international business in the same way. Ex-appropriation the seizure of assets by

government with little or no compensation to the owner is a macro political risk. Communist government in Eastern Europe and china expropriated private firms following World War two.

2. **Micro political risk**: a micro political risk affects specific foreign business. Micro political risks include industry regulations taxes kidnapping and terrorist threats. India's decision in 1975 to reduce foreign equity to 40% and Peru's decision to nationalize its copper mines are example is examples of micro political risks. The US decisions to tax textile imports is another.

II.CURRENCY RISK

Foreign exchange risk is the possibility of a gain or loss to a firm that occurs due to unanticipated changes in exchange rate. For example if an Indian firm imports gods and pays in foreign currency its outflow is in dollar thus it is exposed to foreign exchange risk. If the value of the foreign currency rises the Indian firm has to pay more domestic currency to get the required amount of foreign currency.

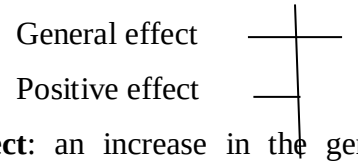
There are mainly following types of currency risk.

1. **Transaction risk/exposure**: transaction exposure can be defined as the sensitivity of realize domestic currency values of the firms contractual cash flows denominated in foreign currencies to unexpected exchange rate changes. In other words this exposure refers to the extent to which the future value of firm's domestic cash flow is affected by exchange rate fluctuations.
2. **Translation risk/exposure**: translation exposure relates to that change in accounting income and balance sheet statements caused by the changes in exchange rates. In other words translation exposure results from the need to translate foreign currency assets or liabilities into the local currency at the time of finalizing accounts.
3. **Economic or operating risk / exposure**: operating exposure is a relatively broader conception of foreign exchange exposure. The prime feature of operating exposure is that it is essentially a long term multi transaction oriented way of looking at the foreign exchange exposure of a firm involved in international business. The standard definition of economic exposure is the degree to which fluctuations in exchange rates will affect the net present value of the future cash flows of a company.

III.INFLATION RISK/PURCHASING POWER RISK

In economics inflation is a rise in the general level of prices of goods and services in an economy over a period of time. When the price level raises each unit of currency buyers fewer goods and services consequently inflation is also erosion in the purchasing power of money a loss of real value in the internal medium of exchange and unit of account in the economy. A chief measure of price inflation is the inflating rate the annualized percentages change in a general price index over time.

Effects of purchasing power risk



1. **General effect**: an increase in the general of prices implies a decrease in the purchasing power of the currency. That is when the general level of prices raises each monetary unit buyers fewer goods and services. The effect of inflation is not distributed evenly in the economy and as a consequence there are hidden costs to some and benefits to others from this decrease in the purchasing power of money. Increases in payments to working and pensioners often lag behind inflation especially for those with fixed payments.
2. **Negative effect**: high or unpredictable inflating rates are regarded as harmful to an overall economy. They add inefficiencies in the market and make it different for companies to budget or plan long term. And inflation can impose hidden tax increase as inflated earnings push tax payers into higher income tax rates unless the tax brackets are indexed to inflation.
3. **Positive effect**: debtors who have debts with a fixed nominal rate of interest will see a reduction in the real interest rate as the inflation rate rises. The real interest on a loan is the nominal rate minus the inflation rate (R=n-i)

   For example, if you take a loan where the stated interest rate is 6% and the inflation rate is at 3% the real interest rate that you are paying for the loan is 3%. It would also hold true that if you had a loan at a fixed interest rate of 6% and the inflation rate jumped to 20% you would have a real interest rate of -14%. Banks and other lenders adjust for this inflation risk either by including an inflation premium in the costs of lending the money by creating a higher initial stated interest rate or by setting the interest at a variable rate.

1.3.1 INCORPORATING RISK IN INVESTMENT DECISIONS

Incorporating risk into the investment decision has fundamentally transformed the way investments are made. Deferent technologies have different risk profiles thus factoring in risk as a real cost element ultimately alters investment choices.

Risk analyzing is a useful tool in extending the depth of project appraisal and enhancing the investment decision. Risk incorporating in the investment decision is important to such a degree for the safeguarding a firm from becoming bankrupt and thus dysfunctional in future. Where risk is not accounted for in the investment decision the firm may reach a position where it is operating on no profit at all or in losses and therefore cannot support its activities financially.

1.3.2 IMPORTANCE OF INCORPORATING RISK IN INVESTMENT DECISION

The importance of risk analyzing and incorporation can therefore be stated as below based on the criteria used to analyze its magnitude for a particular project or firm.

1. It enhances decision making on marginal projects. A project whose single value NPV is small may still be accepted flowing risk analyzing on the grounds that its overall chances for yielding a satisfactory loss. Likewise a marginally positive project could be rejected on the basis of being excessively risky or one with a lower NPV may be preferred to another with a higher NPV because of a better risk/return profile.
2. It screens new project ideas and aids the identification of investment opportunities. Very often a new project concept is formulated that needs to be developed into business opportunity. A substantial investment of human and financial resources is not incurred until the potential investors are satisfied that the preliminary risk return profile of the project seems to be acceptable.
3. It highlights' project areas that need further investigation and guides the collection of information. Risk analysis can contain the costs of investigation and fieldwork project at improving the accuracy of a forecast relating to particular project variables.
4. It also the reformulation of projects to suit the attitude and requirements of the investor. A project may be re-designed to take account for the particular risk predispositions of the investor.
5. It induces the careful reexamination of the single value estimates in the deterministic appraisal. The need to define and support explicit assumptions in the applications of risk analysis therefore forces the analysis to also critically review and revise the base case scenario.

6. It helps to reduce project evaluation bias through eliminating the need to resort to conservative estimates as a means of reflecting the analysis risk expectations and predispositions.
7. It facilitates the thorough use of experts who usually prefer to express their expertise in terms of a probability distribution rather than having to compress and their opinion in a single value.
8. It bridges the communication gap between the analyst and the decision maker. The decision maker in turn welcomes his involvements in the risk analysis process as he recognizes it do be an important management decision role which also improves his/ her overall understanding of the appraisal method.
9. It supplies a framework for evaluating protects result estimates. Unlike the prediction of deterministic which is almost always refuted by the actual project result the probabilities approach is a methodology which facilitates empirical testing.
10. It provides the necessary information base to facilitate a more efficient allocation and management of risk among various parties involved in a project. Moreover it enables the testing of possible contractual arrangements for the sale of the products or the purchase of project inputs between various parties until a satisfactory formulation of the project is achieved.
11. It makes possible the identification and measurement of explicit liquidity and repayment problems in terms of time and probability that these may occur during the life of the project. This becomes possible if the net cash flow figures or other indicators of solvency included in a project appraisal model are monitored during the simulation process.

Case study: 1

To set the stage let us assume that you are trying to decide whether to undertake one of two projects. Project A involves buying expensive machinery that produces a better product at a lower cost. The machines for project A cost 1.000 and if purchased your anticipate that the project with produce cash flows of 500 per year for the next five years. Projects B's machines are cheaper costing 800 but they produce smaller annual cash flows of 420 per for the next five years. We will assume that the correct discount rate is 12%

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Year	Two projects	
	Project A	Project B
0	-1,00	-800
1	500	420
2	500	420
3	500	420
4	500	420
5	500	420
NPV	802.39	714.01

Discount rate – 12%

Both projects are worthwhile since each has a positive NPV. If we have to choose between the projects then project A is preferred to project B because it has the higher NPV.

Example, a project involves initial investment for 5, 00,000. The net cash inflow during the first second and the third year is expected respectively 3, 00,000 and 2, 00,000.At the end of the year the scrap value is indicated at 1,00,000. The risk-adjusted discount rate is 10%. Calculate NPV.

Solution: = t1+t2+t3 – I0

$$= \frac{3,000,000}{1.10} \quad \frac{2,00,000}{(1.10)2} \quad \frac{1,00,000}{(1.10)3} \quad - 5,000,000$$

= 2,873,778

Project would be accepted because NPV is positive.

UNIT-4-IMPORTANT QUESTIONS

1. **What is capital budgeting? Discuss various methods in capital budgeting for a project evaluation.**
2. **Explain the methods under non-discounting criteria with their advantages and disadvantages which are used to evaluate the financial viability of a project.**
3. **Briefly explain about NPV and IRR methods**
4. **Give a note on investment decisions, risks and opportunities in investment decisions.**
5. **What risks are associated with cross-border investment decisions – Give an example for risks involved in a project evaluation?**
6. **Enumerate the various problems and issues in foreign investment analysis.**

Syllabus

(17E00407)INTERNATIONAL FINANCIAL MANAGEMENT

(Elective VI)

1. **Introduction to International Financial management:** IFM meaning**,** Difference between FM & IFM, Nature ,Scope, Importance.
2. Foreign Exchange Market: Functions and Structure of the Forex markets, major participants, types of transactions and settlements, Foreign exchange quotations, .
3. **Management of foreign exchange exposure and risk: Types of Exposure, Economic Exposure, Transaction Exposure, Operating Exposure.**
4. **Cross-border Investment Decisions:** Capital budgeting, Approaches to Project Evaluation, Risk in Cross-border Investment Decisions.
5. **Financing Decisions of MNC`s & Working Capital Management:** Introduction, the cost of capital, capital structure, Cash management, management of receivables, Inventory management.

Text Books:

- International Financial Management, V.K.Bhalla ,S.Chand
- International Financial Managemen, EphriamClark ,Cengage.

References:

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UNIT-5

FINANCING DECISIONS OF MNC`S & WORKING CAPITAL MANAGEMENT

1.1 INTRODUCTIONS TO FINANCING DECISIONS OF MNC'S

- Financial decisions in the international field are complex and risky. Exchange rate fluctuation different accounting systems and government intervention often complicate financial planners in making objective financing and investment choices.
- As technology and computers play a key role in financial decisions, the need for fast information turnaround becomes a necessity.
- Thus to complete in a complex global financial market international companies need to invest in information system's international companies which have more options for acquiring funds than domestic companies can borrow form financial institutions in the countries where they have operations.
- Because of the number of choices available for acquiring funds information becomes crucial in selecting the most cost efficient funding source.
- The many options available to international companies also force them to obtain the most current information to minimize their coat of capital and remain efficient in the management of their funds.
- Some of the factors that affect financial decisions are unpredictable and may undergo dynamic shifts.
- A case in point is the recent exchange rate volatility observed in Latin America Russia and Southeast Asian countries.
- Exchange rate fluctuations along with a rise in inflation increase both the cost and the risk associated with financial decisions.

1.1.1 INTERNATIONAL COST OF CAPITAL

Cost of capital is the expected rat of retune that the market requires in order to attract funds to a particular investment. In economic terms the cost of capital for a particular investment is an opportunity cost the cost of forgoing the next best alternative investment. In this sense it

relates to the economic principle of substitution i.e. an investor will not invest in a particular asset if there is a more attractive substitute.

1.2 INTRODUCTION TO CAPITAL STRUCTURE

A MNC's capital structure decision involves the choice of debt versus equity financing within all of its subsidiaries. Thus its overall capital structure is essentially a combination of all of its subsidiaries capital structures. MNC's recognize the trade-off between using debt and using equity for financing their operations. The advantages of using debt as opposed to equity vary with corporate characteristics specific to each MNC and specific to the countries where the MNC has established subsidiaries.

1.2.1 SITUATIONS DETERMINING MULTINATIONAL FIRMS CAPITAL STRUCTURE

The MNCs operate in economies where diverse regulations exist for the mobilization of resources by companies. These regulations may be discriminatory for MNCs. Therefore the question of target capital structure has to be analyzed in the light of these regulations. There may be following types of situations existing in various economies which are the important determines of capital structure of MNC'S

- When a country does not allow the MNCs having headquarters elsewhere to list their stock on its local stock exchange under these conditions MNCs would decide to borrow funds through debt instruments such as bonds and so it may deviate from the target capital structure.
- In the second situation when the country allows the listing of stock at the local stock exchange then in heat case the nature of the project will decide the financing pattern. If the project is not generating net cash flows for some years say five years or more then the equity financing is more appropriate. Because of in the case one can avoid net cash out flows by not paying dividends in the initial years of operation.
- If a country is facing political turmoil the use of local banks will be more appropriate because these banks may be able to prevent MNC's operations in that country being affected by the political conditions.

1.2.2 FACTORS AFFECTING MNCs CAPITAL STRUCTURES

1. **STABILITY OF MNCs CASH FLOWS:** MNCs with more stable cash flows can handle more debt because there is constant stream of cash inflows to cover periodic interest payments. Conversely MNCs with erratic cash flows may prefer less debt because they are not assured of generating enough cash in each period to make largest interest payments on debt.
2. **MNCs CREDIT RISK**: MNCs that have lower credit risk have more access to credit. Any factors that influence credit risk can affect MNCs choice of using debt versus equity. For example if a MNCs management is thought to being strong and competent the MNCs credit risk may be low allowing for easier access to debt.
3. **MNCs ACCESS TO RETAINED EARNINGS**: highly profitable MNCs may be able to finance most of their investment with retained earnings and therefore use an equity intensive capital structure. Conversely MNCs that have levels of retained earnings may rely on debt financing.
4. **MNCs GUARANTEES ON DEBT**: if the parent backs the debt of its subsidiary the subsidiary borrowing capacity might be increased. Therefore the subsidiary might need less equity financing. At the same time however the parents borrowing capacity might be reduced as creditors will be less willing to provide funds to the parent if those funds might be needed to rescue the subsidiary.
5. **MNCs AGENCY PROBLEMS:** if a subsidiary in a foreign country cannot easily be monitored by investors from the parents country agency costs are higher. To maximize the firm's stock price the parent may induce the subsidiary to issue stock rather than debt in the local market so that its managers there will be monitored.

1.2.3 OPTIMAL FINANCIAL/CAPITAL STRUCTURE OF MNC

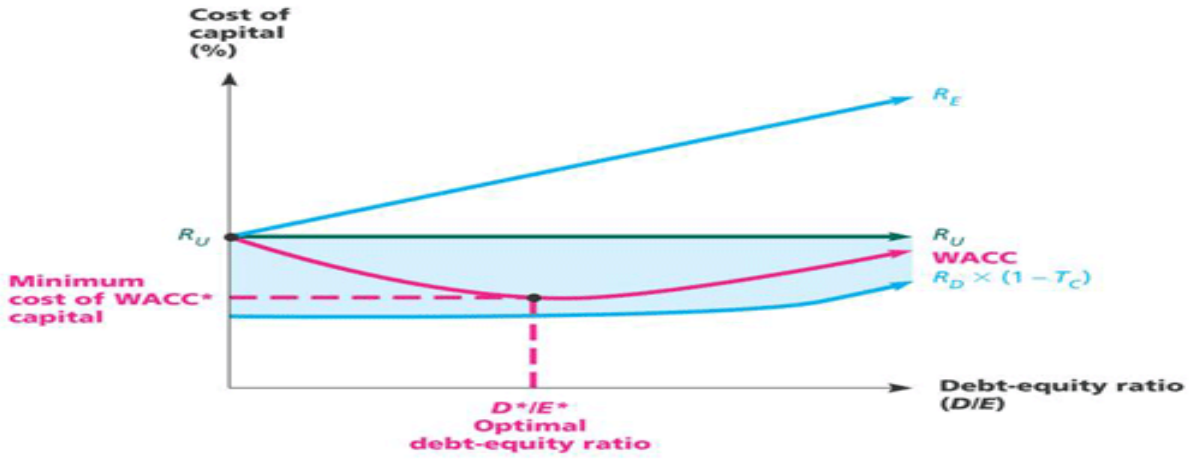
The optimal financial structure of multinational firm takes into account the following.

- Availability of capital which may affect debt rates.
- Can financial risk of a multinational be reduced through international diversification?
- What should be the financial structure of foreign subsidiary?

There is no conclusive opinion whether an optimal financial structure exists for a firm. There is a compromise between the traditional school and th5e Modigliani and miller school of thought which states that when taxes and bankruptcy costs are considered firm has an optimal capital structure determined by that particular mi of debt and equity which minimizes the

firms cost of capital for a given level of business risk. If the business risk of existing projects the optimal mix of debt and equity would change to recognize tradeoffs between business and financial risk. The figure 5.3 shows how the cost of capital varies with the amount of debt employed.

The debt ratio is measured along horizontal axis and the cost of capital along vertical axis. Key is the curve describing cost of equity kd is the curve describing behavior of cost of debt and kiwi represents weighted cost of capital. The 5.3 shows how the cost of capital varies with the amount of debt employed. As the debt ratio increases the overall cost of capital decreases because the heavier weight of low cost dept (kp 1-) to high cost of equity.



The low cost of debt usually is because as debt deductibility of interest as shown by k_d (1-). Overall costs of capital continue to decline as debt. Ratio increases until financial; risk becomes serious that investors and management perceive a real danger of insolvency. This result in sharp increase in cost of debt. This results in U-shape. Cost of capital curve as shown by K_e. The optimal capital structure is given by the lowest point of the marginal cost of capital curve. This point gives the optimum debt ratio associated with the lowest cost of capital. In the figure 5.3 the optimum debt ratio is given by DR* and the associated lowest cost of capital by K_d.

3. INTRODUCTION TO WORKING CAPITAL MANAGEMNET

Working capital management deals with stock and flow perspective of working capital assets. In flow perspective we try to study the positioning of liquid funds. In stock perspective we try to determine appropriate levels and short term debt. Thus in the working capital management we deal with.

1. Cash management

2. Management of receivables and
3. Inventory management.

3.1 CASH MANAGEMENT

Cash management means optimization of cash flows and the investment of excess cash. Since firms operate in multinational financial environment therefore cash management is very complex because of different legal environment prevailing in various countries in respect of cross border cash transfer. In addition the exchange rate fluctuations affect the value of these cross border transfer

3.1.1 OBJECTIVES OF INTERNATIONAL CASH MANAGEMENT

1. Minimize the currency exposure risk
2. Minimize the country and political risk.
3. Minimize the overall cash requirement of the c company as a hole without disturbing the smooth operations of the subsidiary or its affiliate.
4. Minimize the transaction costs.
5. Full benefits of economics of scale as well as the benefits of superior knowledge.

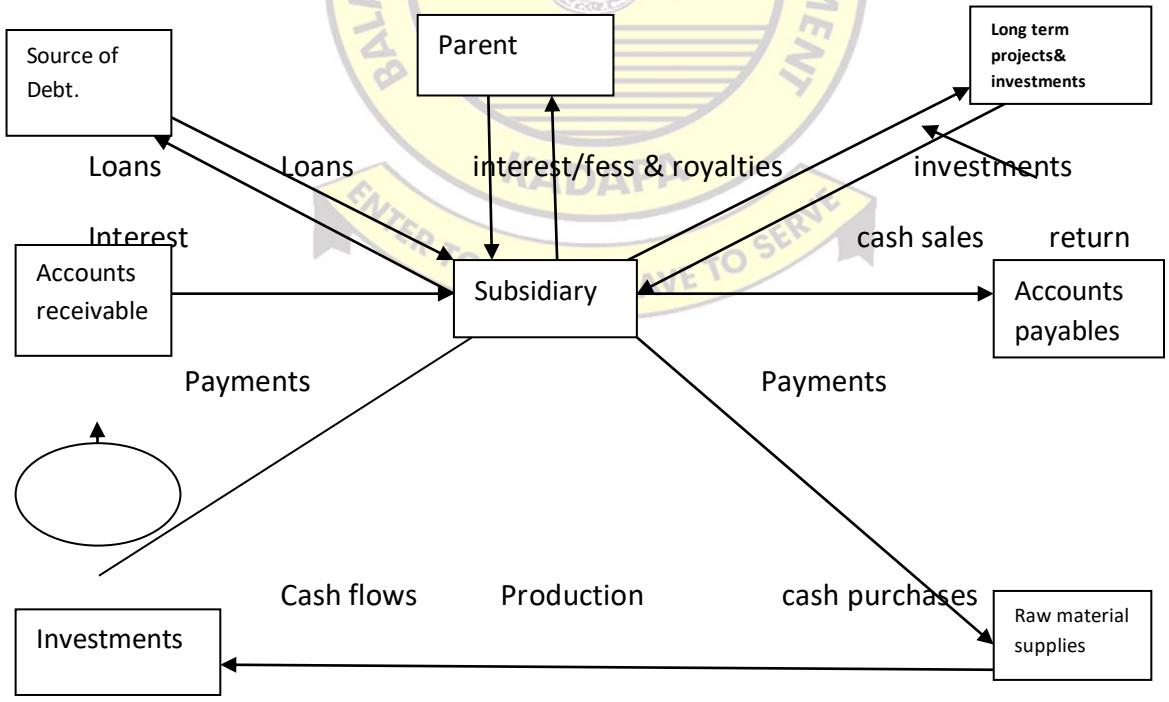


Figure: cash flows of a subsidiary

After accounting for inflows and outflows the subsidiary would find itself with either excess cash or deficient cash. Thus it will need either to invest or to borrow cash periodically. If the

cash is in excess it has to be invested. Investment market has to be determined. Foreign exchange fluctuations make the return uncertain.

3.1.2 IMPORTANT OF INTERNATIONAL CASH MANAGEMENT

Following are the importance of international cash management

1. Increased treasury efficiency.
2. Achievement of economics of scale in the treasury function (by improving the group overall credit standing through a reduction in its exposure to the banking system and thereby obtaining the test possible commercial terms for all members transactions)
3. Reduction of banking charges.
4. Management of the volatility of group liquid cash resources on a daily monthly or annual basis.
5. Maximization of interest returns/minimization of interest expends by offsetting cash shortages and surpluses within the pooling system (thus avoid a banking spread)

3.1.3 PROBLEMS OF INTERNATIONAL CASH MANAGEMENT

The problems of international cash management are as follows.

1. **PROBLEMS IN RECOGNIZING THE PRINCIPLE AND PRACTICES OF OTHER COUNTRIES:** Thought the principles of domestic and international cash management are the same international cash management is wider in scope and is more complicated because it needs to recognize the principle and practices of other borders a number of factors constrains the working of the money manager.
2. **MULTIPLE TAX JURISDICTIONS AND CURRENCIES AND THE RELATIVE ABSENCE OF INTERNATIONALLY INTEGRATED INTERCHANGE FACILITIES:** other important complicating factors in international cash management include multiplex tax jurisdictions and currencies and the relative absence of internationally integrated interchange the relative absence of internationally integrated interchange facilities as are available domestically in the unit states and in other western nations for moving cash swiftly from one location to another. Thus in spite of various restrictions and complicating factors MNCs has significant opportunities for improving their global cash management.
3. **IMPROPER REPORTING SYSTEM:** international cash management also needs a god reporting system. In fact a good reporting system is a crucial aspect of global

determination of cash needs. However there are other reasons why foreign affiliates are often reluctant to provide good quality information to the parent which are as follows.

a. **language problems and local resistance**: language problems are obvious and local resistance is often cultural in the sense that the subsidiary many times perceives the requires or information as a threat to its independence
b. **Technical problems:** technical problems arise in cross border data flows. For example, developing counties may sometimes face a problem of lack of god communications infrastructures.
c. **Government regulations**: Government regulations may range from simple rules about transferring information to rules about actually transferring funds.

4. **COMPANY RELATED CHARACTERISTICS**: in some cases optimizing cash flow can become complicated due characteristics of the MNC. If one of the subsidiaries delays payments to other subsidiaries for supplies received the other subsidiaries may be forced to borrow until the payments arrive. A centralized approach that monitors all inter subsidiary payments should be able to minimize such problems.
5. **GOVERNMENT RESTRICTIONS**: the existence of government restrictions can disrupt a cash flows optimizing policy. Some governments prohibit the use of a netting system. In addition some countries periodically prevent cash from leaving the country thereby preventing net payments from being made. These problems can arise even for MNCs that do not experience any company related problems. Countries in lain America commonly impose restrictions that affect an MNCs cash flows.

4.1 MANAGEMENT OF RECEIVABLES

Accounts receivables are simply extensions of credit to the firm's customers allowing them a reasonable period of time in which to pay for the goods. Most firm treat account receivables as a marketing tool to promote sales and profits. The receivables constitute a significant portion of the working capital and s an important element of it. The receivables emerge whenever goods are sold on credit and payments area defined by customers. As against the ordinary type of loan the trade credit in the forms of receivables is not profit making service but an inducement or facility to the buyer customer of the firm.

According to HAMPTON receivables area asset accounts representing amount owned to firm as a result of sale of goods or service in ordinary course of business.

Thus receivable are forms of investment in any enterprise manufactures and selling goods on credit basis large sums of funds are tied up in trade debtors. Hence great deal of careful analysis and proper management is exercised for effect and efficient management of receivables to ensure a positive contribution towards increase in turnover and profits.

4.2 CONCEPT OF INTERNATIONAL RECEIVABLES MANAGEMENT

Firms grant trade credit to customers both domestically and international because they accept the investment in receivables to be profitable either by expanding sales volume or by retaining sales that otherwise would be lost to competitors. Some companies also earn a profit on the financing charges they levy on credit sales.

The need to scrutinize credit terms is particularly important in countries experiencing rapid rates of inflation. The incentive for customers to defer payment liquidating their debts with less valuable money in the future is great.

Furthermore credit standards abroad are often mor4e relaxed than in the home market especially in countries lacking alternative sources of credit for small customers. To remain completive MNCs may feel compelled to loosen their own credit standards. Finally the compensation system in many companies tends to reward higher sales more than it penalized an increased investment in accounts receivable.

To effort to better manage receivables overseas will not get are if finance and marketing don't co-ordinate their efforts. In many companies finance and marketing work at rose's purposes. Marketing thinks about selling and finance thinks about speeding up cash flows. One way to ease the tensions between finance and marketing is to educate the sales force on how credit and collection affect company profits. Another way is to tie bonuses for salespeople to collected sales or to adjust sales bonuses for the interest coasty of credit sales.

Credit sales lead to the emergent of account receivables. The management of receivable focuses on two important facts.

- The cost of the credit sale should into exceed the benefit from the credit sales.
- Whether the sale is confined within different units of the firm or it is an inter firm sale.

4.3 FACTOS CONSIDERED IN RECEIVABLES MANAGEMENT

Once credit has been granted to a customer responsibility for the billing and collection from the customer usually passes to the accounting department. The ability of the accounting staff to reliably invoice and collect in a timely manner has a major impact on the amount o working capital invested in accounts receivable. The treasure does not have direct control over these functions but should be aware of the following factors which can seriously extend customer payment interval unless careful managed.

1. **INVOICING DELAY:** invoices should be issued immediately after the related goods or service has been provided. If the accounting staff is billing only at stated intervals then receivable are being extended just because of an internal accounting work policy.
2. **INVOICING ERRORS**: if invoices are being continually re issued due to errors then additional controls are needed to increases the accuracy of initial invoices. This can be a serious issue since invoicing errors are usually found by the customer which may be several weeks after they were originally issued
3. **INVOICE TRANSMISSION**: there is a multi-day mailing delay when invoices are delivered through the postal service. Instead the accounting system should be configured to issue invoices by email or electronic data interchange or the accounting staff should manually e mail invoices.
4. **LACK OF RECEIPT:** if cheques are received at the company at the company location and then sent to the bank this creates this creates a delay of potentially several days before the cheques are processed internally deposited and then clear the bank. Instead customers should send all cheques to a lock box so that checks are deposited in the minimum amount of time thereby increasing the availability of funds.
5. **COLLECTION MANAGEMENT:** there should be a well-trained collection staff that assign responsibility for specific accounts focuses on the largest overdue accounts balances first begins talking to customers immediately after payment of due dates are reached and is supported by collection software systems. The group should use a broad array of collection techniques including dunning letters on site visits attorney letters payment commitment letters credit holds and collection agencies..
6. **INTERNAL ERROR FOLLOW-UP**: if payments are being delayed due to service problems by the company or product flaws the collection staff should have a tracking system in place that stores the details of these problems and the accounting manager should follows up with managers elsewhere in the company to have them resolved.

The treasure can periodically inquire of the controller if these collection issues are being managed properly. Another approach is to obtain an accounts receivable aging report and determine the reasons why overdue receivable have not yet been paid. At a minimum the treasure should track the days receivables outstanding on a timeline ad follow up with the controller or chief financial officer if the metric increases over time.

5. INTERNATIONAL INVENTORY MANAGEMENT

Inventory accounts for the biggest share of the current assets. At the same time it is th6e least liquid asset. This is why its management deserves sufficient care. To some extent the management of inventory in an internationally firm is similar as in case of a domestic firm. But some additional factors are important in the case of an international firm. They are,

1. An international firm has to maintain inventory simultaneously in different countries.
2. Transit time is quite longer
3. Customer procedures are quite lengthy
4. Political risk along with exchange rate risk is there

Based on these problems there are some deviations from the simple norm of inventory management which is practiced in a domestic firm.

5.1 PRODUCTION LOCATION AND INVENTORY CONTROL

Now a day's companies are producing overseas to reap the advantage of low labor costs tax holidays low interest loans and other subsidies provided by governments attracting foreign direct investment. These strategy advantages will provide competitive edge only if close contact with domestic customers is maintained. The result is larger costs on foreign operations in the form of larger inventory costs and the costs of disruptions in supply. Additional interest cost incurred on larger inventory holding is calculated as follows.

Added interest expense = opportunity cost added time costs of funds in transit per unit.

For example, an American company is producing in India and the transit time first India to America is five weeks excluding work in process and inventory than would parts manufactured domestically.

Added interest expense = 0.15 (5/52) 10 = 0.1442

5.2 ADVANCE INVENTORY PURCHASES

In many developing countries forward contracts for foreign currency are limited in availability or are nonexistent. In addition restrictions often preclude free remittance making it difficult if not impossible to convert excess funds into a hard currency. The trade of involves owing goods for which local currency price may be increased thereby maintaining the dollar value of the asset even if devaluation occurs versus forgoing the return on local money market investments.

5.3 STOCKPILLING

Possessing a bigger stock than the EOQ which is often known as stockpiling because of long delivery lead times the often limited availability of transport for economically sized shipments and currency restrictions the problem of supply failure is of particular importance for any firm that is dependent on foreign sources.

An adequate inventory gives a firm a certain amount of flexibility in its purchase programme. However sometimes additional purchases may be made to take advantage of quantity discounts. The concept of economic order quantity for a particular item of inventory can e handy in this respect. The data needed are forecasted usage of the item ordering cost which is supposed to be constant and the carrying cost.

The formula is EOQ $= \sqrt{\frac{2A\ OC}{CC\ UC}}$

Where,

A – Annual requirements in units

OC – ordering cost per order

CC – carrying cost (%)

UC – unit cost ()

FACTORS AFFECTING MANAGEMENT OF INVENTORY

Operations in inflationary devaluation prone economics sometimes force management to modify its normal approach to inventory management. In some cases management may choose to maintain inventory and reorder levels far in excess of what would be called for in an economic order quantity model

1. **ANTICIPATING DEVALUATION:** under conditions in which local currency devaluation is likely management must decide whether to build up inventory of imported items in anticipation of the expected devaluation. This freeze would prevent the imparted inventory from being sold for an appropriate mark up above its now higher replacement value. Still worse the devaluation may not occur as anticipated living management holding an excessive level of inventory until it can be worked down.
2. **ANTICIPATING PRICE FREEZES**: to circumvent an anticipated price freeze management can establish the local currency price of an imported item a high level with actual sales being made at a discount from this posted price. In any event it provides no protection against competitive price squeezes. An alternative is to sell at the posted price but increase selling promotion or other marketing mix activities which can letter be reduced.
3. **FREE TRADE ZONES AND FREE INDUSTRIAL ZONES:** a free trade zone combines the old idea of duty ports with legislation that reduces or eliminates customs duties to retails or manufacturers who structure their operations to benefit from the technique. Income taxes may also be reduced for operations in a free trade zone. The old duty free ports were typically in the dock area of major seaports, where goods were held duty free until the owner was ready to deliver them within the country. Modern free trade zones by compensation are often located away from a port area. For example the Italian firm of Olivetti has such a zone in Harrisburg Pennsylvania.

   Free trade zones functions in several ways. There may be a place a offload merchandise for subsequent sale within the country when the zone is located. An example is a storage area for imported. Toyota automobiles in the port of loss angels.

   A third type of zone is a fully fledged manufacturing center with major portion of its output re-exported out of the country. Two examples are Penang. Malaysia and Madagascar where such zones are officially designed free industrial zones. In Penang companies as diverse as dell computers national semiconductor. Sony borsch and trine air conditioning manufacturing final products.

CASE STUDY:1

Jason owns a fish shop where he sells an exotic variety of tuna fish which he imports from Japan.

Jason refrigerates the fish in a cold storage facility near his shop that charges him a fixed annual fee of $1000 and variable charge of $5 per day for each fish container that is stored.

Every morning, Jason brings fish from the cold storage to his shop for sale. Jason estimates that he incurs $10,000 electricity cost each year on refrigerating the fish inside his own shop.

Jason incurs the following ordering costs:

Delivery charges of $10,000 per delivery

Import duties of $300 per carton

Custom fees of $200 per order

Import license fee of $150 per annum

Jason currently imports fish by placing one order of 20 cartons every month. Each carton costs $2,000.

Jason is wondering if he can save inventory costs by adopting EOQ model.

a) Calculate the current annual total inventory costs

b) Calculate the economic order quantity

c) Calculate the annual total inventory costs if EOQ is used

Solution

a) Current Inventory Cost

Costs	Working	$
Purchase Cost	Annual demand = 20 x 12 = 240 cartons Purchase cost = 240 x $2000 = $480,000	480,000
Order Cost		
Delivery Cost	Number of deliveries = 12 Delivery Cost = 12 x $10,000 = 120,000	120,000
Import Cost	Import fee = $300 x 240 cartons = $72,000	72,000
Custom Cost	Custom fee = $200 x 12 orders = $2400	2,400
Holding Cost		
Cold storage	Maximum number of cartons stored = 20 Average number of cartons = 20 ÷ 2 = 10 Variable charge = 10 x $5 x 365 = $18,250 Fixed charge = $1,000 Total = $19,250	19,250
Electricity		10,000
Total Inventory Cost (Current)		703,650

b) Economic Order Quantity

$$EOQ = \sqrt{\frac{2 \times 10{,}200\ (W1) \times 240\ (W2)}{1{,}825\ (W3)}}$$

$\approx$ 52 cartons

Order Cost (W1)

Delivery Cost	$10,000
Import fees	-
Custom fees	$200
Cost of 1 order	$10,200

Note:
Import fees can be ignored in EOQ calculation as they remain the same irrespective of the number of orders.

Annual Demand (W2) = 240 cartons

Holding Cost (W3)

Cold Storage - Variable (365 x $5)	$1,825
Cold Storage - Fixed	-
Electricity	-
Cost of holding 1 carton for 1 year	$1,825

c) Inventory Cost using EOQ

Costs	Working	$
Purchase Cost	As before	480,000
Order Cost		
Delivery Cost	Annual Demand = 240 cartons Number of deliveries = 240/52 ≈ 5 Delivery Cost = 5 x $10,000 = $50,000	50,000
Import Cost	As before	72,000
Custom Cost	Custom fee = $200 x 5 orders = $1000	1,000
Holding Cost		
Cold storage	Maximum number of cartons stored = 52 Average number of cartons = 52 ÷ 2 = 26 Variable charge = 26 x $5 x 365 = $47,450 Fixed charge (as before) = $1,000 Total = $48,450	19,250
Electricity (as before)		10,000
Total Inventory Cost (using EOQ)		661,450

Using EOQ Model will save Jason $42,200 (703,650 - 661,450) annually.

1. An auto parts supplier sells Hardy-brand batteries to car dealers and auto mechanics. The annual demand is approximately 1,200 batteries. The supplier pays \$28 for each battery and estimates that the annual holding cost is 30 percent of the battery's value. It costs approximately \$20 to place an order (managerial and clerical costs). The supplier currently orders 100 batteries per month.

   a. Determine the ordering, holding, and total inventory costs for the current order quantity.

   b. Determine the economic order quantity (EOQ).

   c. How many orders will be placed per year using the EOQ?

   d. Determine the ordering, holding, and total inventory costs for the EOQ. How has ordering cost changed? Holding cost? Total inventory cost?

Solution We are given the following information:

annual demand: $D = 1200$ batteries per year

item cost: $c = \$28$ per battery

holding cost: $H = ic = 0.30(28) = \$8.40$ per battery per year

order cost: $S = \$20$ per order

current order quantity: $Q = 100$ batteries

a. The current ordering and holding costs are: $\frac{D}{Q}S + \frac{Q}{2}H = \frac{1200}{100}(20) + \frac{100}{2}(8.40) = 240 + 420 = \$660.$

b. The EOQ is $Q^* = \sqrt{\frac{2DS}{H}} = \sqrt{\frac{2\times 1200\times 20}{8.40}} = 75.6 \rightarrow 76$ batteries.

c. The company will place $\frac{D}{Q^*} = \frac{1200}{76} = 15.8$ orders per year.

d. The new ordering and holding costs are: $\frac{D}{Q^*}S + \frac{Q^*}{2}H = \frac{1200}{76}(20) + \frac{76}{2}(8.40) = 315.79 + 319.20 =$ \$634.99. The company will save \$25.01 by using the EOQ.

2. Upon closer inspection, the supplier determines that the demand for batteries is normally distributed with mean 4 batteries per day and standard deviation 3 batteries per day. (The supplier is open 300 days per year.) It usually takes about 4 days to receive an order from the factory.

   a. What is the standard deviation of usage during the lead time?

   b. Determine the reorder point needed to achieve a service level of 95 percent.

   c. What is the safety stock? What is the holding cost associated with this safety stock?

   d. How would your analysis change if the service level changed to 98 percent?

Solution In addition to the information from the problem above, we are told:

average demand rate: $d = 4$ batteries per day

standard deviation of demand: $\sigma_d = 3$ batteries *per day*

lead time: $L = 4$ days

300 operating days per year

UNIT-5-IMPORTANT QUESTIONS

1. **Define cost of capital. Explain about determination of cost of preference share and equity share capitals.**
2. **Explain the objectives, advantages, importance and limitations of cash management.**
3. **Briefly explain the capital structure policies in practice in India with some examples.**
4. **What are the components of short term assets? Explain the importance of international inventory management.**
5. **What is capital structure? Distinguish between international capital structure and domestic capital structure.**

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