

A STUDY ON INVESTMENT PATTERN OF COMMERCIAL BANKS

(With Reference to Everest Bank, Nepal Investment Bank and Kumari Bank)

A Thesis

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RECOMMENDATION

This is to certify that the Thesis:

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Entitled

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**has been prepared as approved by this Department in the prescribed format of
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DECLARATION

I hereby, declare that the work reported in the thesis entitled "A Study on Investment Pattern of Commercial Banks" (With Reference to Everest Bank Ltd., Nepla Investment Bank Ltd and Kumari Bank Ltd.) submitted to Nepal Commerce Campus, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirements of Master Degree in Business Studies (M.B.S.) under the supervision Dr. Sushil Bhakta Mathema, Nepal Commerce Campus, T.U.

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ABBREVIATIONS

A.D.	: Anno Domini
A.M.	: Arithmetic Mean
A/C	: Account
ASC	: Accounting standard committee
B.S.	: Bikram Sambat
B.S.	: Bikram Sambat
BEP	: Break Even Point
B.N.L.	: Bottler Nepal Limited
C.V.	: Coefficient of Variation
CM	: Contribution Margin
CMPU	: Contribution Margin per Unit
Co.	: Company
CVP	: Cost Volume Profit
DDC	: Dairy Development Corporation
DOL	: Degree of Operating Leverage
DP	: Desired Profit
DPAT	: Desired Profit after Tax
DPBT	: Desired Profit before Tax
EBIT	: Earning before Interest and Tax
ED	: Edition
F/Y	: Fiscal Year
FC	: Fixed Cost
KD	: Kathmandu Dairy
KMSS	: Kathmandu Mix Supply Scheme
Ltd	: Limited
MC	: Marginal Contribution
MOS	: Margin of Safety

P.E	: Probable Error
P.E	: Public Enterprise
P/l	: Profit & Loss
P/v Ratio	: Profit Volume Ratio
PPC	: Profit Planning and Control
Pvt.	: Private
Rs.	: Rupees
SD	: Standard Deviation
SPPU	: Selling Price per Unit
TC	: Total Cost
TCM	: Total Cost Contribution Margin
TFC	: Total Fixed Cost
TS	: Total Sales
VC	: Variable Cost
VCPU	: Variable Cost per Unit

CHAPTER - I

INTRODUCTION

1.1 General Background

Nepal is a landlocked country surrounded by mountains and hills. Only about 17% of area lies in plain Terai region. Physically, Nepal is divided into three regions on the basis of geographic features. The Himalayan region consists of area ranging from 4887m to 8848m above the sea level; embracing eight of the earth's tallest mountain peaks. There is sparse human habitation in this region and occupies only about 15% of the total area of the country. The Terai region consists of nearly 17 % of the total area. About 40% of this region is under cultivation. Population in this region constitutes 46.7% of the total population of the country. The hilly region covers about 68% of the total area. Only 10% area of the region is cultivated. Out of the total population 46% of population constitutes in this region (Agrawal: 2058, 85).

Nepal has a dualistic economy. It is largely dominated by agriculture, which accounts for 40% of national gross domestic product (GDP), providing employment to 81.2% of the economically active population of the country in 1991. But in recent years the non-agriculture sector is contributing more in GDP than the agricultural sector. Public & private manufacturing industries were established with the objective of balanced regional development, public welfare, employment generation, import substitution and to export promotion for dissemination of the development activities according to national priority. This implies that Nepal on the one hand has market economy and subsistence economy whereas subsistence economy on the other hand.

All the developed and underdeveloped countries have accepted public enterprises for their socio-economic development. The public enterprise has not clearly defined in many situations. It has been defined differently by various agencies and government to suit their relative situation. Among them 'world development report' 1988 has defined, as "all those state owned enterprises which financially autonomous and legally distinct entities, wholly and partly owned by central or sub-national government are the public enterprises."

Nepal is a democratic, small and landlocked country situated in the southern slopes of Himalaya. Power river rush out of the Himalayas, beautiful temples,

culture and festivals and equally exotic people really make Nepal the more beautiful nation of the world. The Himalayan nation, the land of Buddha and the Everest made Nepal a unique sovereign nation. It is endowed with natural resources. Geographically, it lies in 26° 22' North and 84° 5' to 88° 12' East latitude and elevation range from 305 meters to 8848 meters. Total area of 147,181 sq. km with length of 885 km and the width ranging from 144 km to 240 km having salient feature of landlocked, developing third pole, non-aligned, peaceful and small country Nepal is also known as a nation of color and contrasts of nature, culture and adventure all over the world(MOF/NG: 2007).

Nepal is one of the developing countries in the world characterized by high population growth. Unit price (2.2%), low per capital income (\$385), and low unit price of capital formation. Gross domestic saving is 11 percent of the GDP, and almost half of the population (above 50 percent population), line below the poverty line. Landlocked, unfavorable topography, absence of economic infrastructure, political instability in the past and lack of political commitment are some of the reasons behind the backward economic condition (MOF/NG 2007).

Ironically, the country is under the vicious circle of poverty. More than 45% of population lies below poverty line. Agriculture is the backbone of Nepalese economy, means of livelihood for the majority of population and the main source of gross domestic production, income and employment. But nonagricultural sectors have also significant contribution in the national economy.

In the context of Nepal, business and commercial sector is just creeping now. It is obvious that, Nepal is a developing country. The majority of the people are engaged in agriculture. Hence, the commercial sector is very backwards so far than other developed countries. In the period of Panchayat regime, many manufacturing & service oriented public enterprises were established to play the vital role for economic development of the nation. Government spent huge amount in public utility sector such as water, telecommunication and electricity. But their performance was not satisfactory. After the restoration of democracy, private sector started to play crucial role for the development of the country. After the political change, public enterprises started to privatize due to their poor performance. So, the business and commercial sector in Nepal taking its way to the expansion and development. Once again, the Maoist insurgency hit all over

the country almost 12 years and created many difficulties for business and commercial sector. Now, the situation has totally been changed because the CPN-Maoist came to the negotiating table and entered into the peace process. Through the recently held constitutional assembly election, CPN-Maoist emerged as a largest political party. Thus, the ray of hope and clean environment for the expansion and development of business and commerce has been emerged.

"Every enterprise has its own goals and objectives. The management of the organization is responsible for the decision making, planning, formulating strategies and their implementation. The management is efficient if it is able to accomplish the objectives of the enterprise. It is effective, when it accomplishes the objectives with minimum effort and cost. In order to attain long-range efficiency and effectiveness, management must chart out its course of action in advance. A systematic approach that facilitates effective management performance is profit planning and control or budgeting. Budgeting is therefore an integral part of management. In a way, a budgetary control system has been described as a historical combination of a goal-setting machine for increasing an enterprise's profit and goal achieving machine for facilitating organizational coordination and planning while achieving the budgeted targets" (Goel, Bhattarai, Gautam, 2003:11). Moreover, a profit plan or budget is the formal expression of the organization's plans and objectives stated in financial terms for a specified future period of time.

"Revenue is the aggregate exchange value of goods and services provided to the customers. In other words, revenue is any form of income earned by the organization in an accounting period. Revenue results from the sale of goods and rendering of services and measured by the charge made to customers, clients or tenants for. It also includes gains from the sale or exchange of assets other than stock in trade, interest and dividends earned on investments and other increases in the owner's equity except those arising from capital contributions and capital adjustments. Revenue from ordinary sales or from other transactions in the ordinary course of business is sometimes described as operating revenue" (Bhattacharya & Dearden, 1980:137)

"Defined in its simplest terms planning is the determination of anything in advance of action, it is essentially a decision making process that provides a basis for economical and effective action in the future. Effective planning sets the stage

for integrated action to take places, reduces the number of unforeseeable crises, promotes the use of more efficient methods and provides the basis for the managerial function of control. Thereby assuring focus on organizational objectives" (Edwin, 1969:49)

Revenue planning is the future estimation of revenue which displays the projected sales, income and future cash inflow. The revenue planning estimates are only a guide to the level of future revenues, not a guarantee. If the economy remains strong, the planning estimates are likely to underestimate future revenues. But, if the economy fails to perform at the high level anticipated in the control, the planning estimates will overstate future revenues. The revenue planning process is a necessary part of overall profit planning and control (PPC) because (a) it provides for the basic management decision about marketing (b) based on those decisions, it is an organize approach for developing a comprehensive sales plan. If the revenue plan is not realistic, most, if not all of the other parts of the overall profit plan also are not realistic. Therefore, if the management believes that a realistic revenue plan cannot be developed; there is little justification for PPC.

Analysis of revenue planning is a crucial part of overall profit planning of business enterprises. Poor system of planning adversely affects profit planning. Thus, periodical analysis and review of revenue planning is necessary in order to ensure smooth functioning of enterprises.

Budgeting is the key to financial planning and control. Though profit planning is the essence of management and revenue planning is the starting point of overall planning process. Therefore, every business and non business organization should prepare revenue plan which is prepared on the basis of sales forecast. Systematically and properly prepared revenue planning only plays vital role for effective utilization of resources and control system.

Cash is the most important assets for the operations of the business. It is an idle and non earning asset. Therefore, the firm should keep sufficient cash, neither more nor less. More cash balance reduce the rate of return on equity and hence the value of the firm's stock. The term cash includes coins, currency and cheques hold by the firm and balances in its bank account. Sometimes non cash items such as marketable securities or bank deposits are also included in cash. Cash management involves managing the cash of the firm to maximize firm's value by

keeping ideal cash balance. The task of cash management is to determine how much cash a firm should have on hand at any time to ensure normal business operations continue without interruption. If a firm holds more cash than its requirements, shareholder's returns will not be maximized. Cash management involves several functions such as cash planning, managing cash flows, identifying optimal cash balance and proper utilization of cash etc. The essence of cash management is the preparation of cash budget and cash flow statement which projects and identifies the inflow and outflow of cash. Thus, cash budget is also a key to the overall comprehensive profit plan. It provides measures and guide lines for effective control of cash.

1.2 An Overview of Nepal Electricity Authority:

NEA is the largest government enterprise in Nepal with country highest capital investment, assets and human resources. It has undertaken the overall responsibility for planning, construction, operation and generation of electricity in the nation.

Nepal Electricity Corporation (NEC) was established on Bhadra 2019 B.S., under Electricity Corporation Act 2019 to generate and distribute electricity in secured, efficiently, economic and orderly manner in Bagmati Zone and Bhimphedi town in Makwanpur. Before 2019 B.S, Bijuli Adda which was under the ministry of water and power used to distribute the electricity in Kathmandu valley. Bijuli Adda held monopoly power in the management of electricity till 2019 B.S. In fact, Nepal Electricity Corporation was the modified form of Bijuli Adda regarding operational areas. The responsibility of Nepal Electricity Corporation got increase in 1973 B.S. to supply power in Narayani Zone. In 2031 B.S. Eastern Zone Electricity Corporation was established in Biratnagar to facilitate electricity supply to the eastern part of Nepal. In 2039 B.S. however both Nepal Electricity Corporation and Eastern Zone Corporation were merged into a single organization, mainly three agencies namely NEC, EZEC and other electricity department, division, committees etc.

Nepal Electricity Authority was incorporated on 1 Bhadra, 2042 B.S, under the Nepal Electricity Authority Act, 2041. All format division and committees concerning electricity production, supply and distribution were (except

Marshyandi Electricity Development Committee) amalgamated into Nepal Electricity Authority. Later Marshyandi Electricity Development Committee was also handed over to NEA after the completion of its construction work. NEA was established as a unified organization in Bhadra 1st 2042 B.S. The specific objectives of NEA is to generate, transmit and distribute adequate, reliable and affordable power by planning, constructing, operating and maintaining all generation, transmission and distribution facilities in Nepal's power system both interconnected and isolated.

1.3 Statement of the Problem

Cash management in public utility of Nepal is primarily based on the traditional practices, lacking in a scientific approach. A more serious aspect of cash management has been the absence of any formalized system of planning and cash budgeting in many enterprises do have the practice if forecasting cash requirement or a form basis (Bajracharya, 1990:23). Revenue planning and cash management has been the most intricate and challenging area if modern corporate finance as much as the management always face a trade-off between the liquidity and profitability of the firm. Though most of the enterprises in Nepal have been well recognized the importance of proper cash, they are still facing the problem of cash management (Bajracharya, 1990:23).

NEA is the biggest public enterprises in Nepal with the biggest investment of authorized capital. There is a no market competition as other private enterprises and has higher future scope of production. Thus it should earn good net profit, which may contribute to the development budget of country. Although, it aims to produce and distribute electricity power by service motive, it must generate profit at least to cover its cost of capital. The success or failure of any enterprises is measured on the bases of profitability or surplus. The profit depends on the systematic budgeting and financial performance. This research intends to explore the following problems:-

- ❖ Whether NEA's losses in transmission is in specified or estimated limit or not
- ❖ Whether the sales target stated in annual budget and actual sales are consistent or not.
- ❖ Whether NEA's revenue planning is effective or not.

- ❖ Whether cash collection and disbursement of NEA is in proper way or not.
- ❖ Whether NEA's production (i.e. supply) is based on sales (i.e. demand or not).

1.4 Objectives of the Study

The main objective of the study is to analyze revenue planning and cash management of Nepal Electricity Authority. To identify problems and recommend possible remedial measures, therefore, the major objectives of the study are as follows.

- ❖ To make a comparative study of revenue generation of NEA.
- ❖ To analyze the gap between budgeted and actual revenue of NEA.
- ❖ To analyze the relationship between total power available and losses in transmission.
- ❖ To evaluate financial performance of NEA.
- ❖ To examine and critically analyze the case management practices in NEA.
- ❖ To review cash management aspect of NEA.
- ❖ To suggest and recommend on the basis of major findings.

1.5 Significance of the Study

The study evaluates the cash management and revenue planning of NEA. The study compares the cash management which helps the concerned companies to formulate strategies to face the increasing competition and to achieve the targeted objectives.

Similarly the aim of the study is to identify the problems on cash management and revenue planning. It provides a useful feedback, remedial actions, good financial planning and takes appropriate decisions to the policy makers of the selected organization, governments and also the other concerned field.

Likewise the research will provide required information to the persons and parties such as general readers, decision makers, brokers traders, stock holders financial agencies, businessman and general public and also useful for teachers and students of the particular subjects and the firms and others those having interest in financial management.

1.6 Limitation of the Study

Each and every research has some limitations. Basically, not availability of required data and information would be the major limitations of the study. The study has been conducted with the following limitations.

- Last five fiscal years will be the basis for the study.
- The study would base on secondary data.
- The accuracy of this study would base on the response and the data available from the management of the company.
- Due to limited time and resource constraint, these studies will neither be comprehensive nor extensive.
- The study covers only the revenue planning and cash management.
- This study would only be concerned with fulfilling the partial requirement in Master of Business studies (MBS)

1.7 Organization of the Study

This study has divided into five parts Viz. introduction, review of literature, research methodology, presentation and analysis of data, conclusion, summary and recommendations.

Chapter 1 - Introduction

This chapter is introduction framework that includes background of the study, focus of the study, profile of the company, statement of the problems, objectives of the study, significance of the study, limitations of the study and organization of the study.

Chapter 2 – Review of the Literature

This chapter will review the existing literature in the relevant area. Mainly, it includes review of theories and journal, review of previous research work and research gap.

Chapter 3 – Research Methodology

This chapter deals with methodology that includes research design, sources of data, data collection techniques, method of analysis and research variable.

Chapter 4 - Presentation and Analysis of Data

This chapter deals with the presentation and analysis of collected data and information. For this purpose various analytical tools will be used.

Chapter 5 - Summary, Conclusion and Recommendations

This chapter will be the final chapter of the study that includes summary of the study, conclusion and recommendations.

The Bibliography appendix will be included in the last of the thesis.

CHAPTER - II

RIVIEW OF LITERATURE

After selecting the topics of the research, researcher study different magazines, journals, and newspaper, book to collect the information about their subject matter. This process of studying different materials, which are concerned with the selected topics of the research, is known as review of literature. "Review of literature is useful in research because it provides the insight and general knowledge about the subject matter of research"(Young, 1996:24).

2.1 Conceptual Framework

2.1.1 CASH MANAGEMENT:

Before knowing about 'Cash Management' it is better to know about 'Cash'. Cash is the money, which the firm can disburse immediately with out any restriction. The term cash includes coins currency and cheques held by the firm and balance in its bank accounts. Sometimes near cash items, such as marketable securities is also included in cash.

Cash is the important current asset for the operations of the business organization and public organization. Cash is the basic input needed to keep the business running on a countries basis, it is also the ultimate output expected to be realized by selling the service or product manufactured by the firm. The firm should keep sufficient cash, neither more nor less. Cash shortages are disrupting the firm's manufacturing operations while excessive cash is simply remaining idle, without contributing anything towards the firm's profitability. Thus, a major function of the financial manager is to maintain a sound cash position.

The term "Cash Management" is concerned with the management of current assets and current liabilities of the business, which is necessary for day-to-day operation. "Cash management is concerned with the decision regarding the short-term funds influencing overall profitability add risk involving in the firm. The management of cash has been regarded as one of the conditioning factors in the decision making issues" (Saksena 1990:164). It is no doubt, very difficult to point out as to how cash is needed by a particular company, but it is very

essential to analyze and fine out the solution to make an efficient use of funds for minimizing the risk of loss to attain profit objectives.

Good cash management means:

- Knowing when, where, and how your cash needs will occur,
- Knowing what the best sources are for meeting additional cash needs and
- Being prepared to meet these needs when they occur, by keeping good relationships with bankers and other creditors.

Cash flow management is the process of monitoring, analyzing, and adjusting business' cash flows. For businesses, the most important aspect of cash flow management is avoiding extended cash shortages, caused by having too great a gap between cash inflows and outflows. We won't be able to stay in business if we can't pay our bills for any extended length of time.

Therefore, a cash flow analysis should be made on a regular basis, and use cash flow forecasting so that necessary steps to head off cash flow problems can be taken. Many software accounting programs have built in reporting features that make cash flow analysis easy. One of the most useful strategies for business is to shorten cash flow conversion period so that business can bring in money faster.

2.1.2 FUNCTIONS OF CASH MANAGEMENT

There are various functions of cash management. They are as follows:

2.1.2.1 Cash planning: Cash flows (inflows and outflows) should be planned to project cash surplus or deficit for the period. Cash budget is prepared for this purpose.

2.1.2.2 To design and manage cash flows: The cash flows (inflows and outflows) should be properly managed. The inflows of cash should be accelerated and the outflows of cash should be decelerated as possible.

2.1.2.3 To maintain cash and marketable securities in amounts close to optimal level: The firm should try to maintain the appropriate level of cash balances. The

cost of excess cash and the danger of cash deficiency should be matched to maintain the optimal level of cash balances.

2.1.2.4 To place the cash and marketable securities in the proper institutions and in the proper forms: The idle cash or precautionary cash balances should be properly invested to earn profits. The firm should take the appropriate decision about the division of such cash balances between bank deposits and marketable securities.

2.1.3 IMPORTANCE OF CASH MANAGEMENT:

'Cash' the most liquid asset, is of vital importance to the daily operations of business firm. "Cash is both the beginning and the end of the working capital cycle- cash, inventories, receivable and cash. Its effective management is the key determinant of efficient working capital management. Cash like the blood stream in the human body gives vitality and strength to a business enterprise. The steady and healthy circulation of cash through out the entire business operation is the business solvency." According to J.M. Keynes 'it is cash, which keeps a business going. Hence, every enterprise has to hold necessary cash for its existence. In a business firm ultimately, a transaction results in either an inflow or an outflow of cash. In an efficient managed business, static cash balance situation generally does not exist. Adequate supply of cash is necessary to meet the requirement of the business. Its shortage may stop the business operations and may degenerate a firm into a state of technical insolvency and even of liquidation. Through idle cash is sterile; its retention is not without costs. Holding of cash balance has an implicit cost in the form of its opportunity costs. 'The highest the level of idle cash the greater is the cost of holding it in the manner of loss of interest, which could have been earned either by investing it and securities or by reducing the burden of interest charges by paying off the loans taken previously. If the level of cash balance is more than the desired level with the firm, it shows mismanagement of funds. Therefore, for its smooth running and maximum profitability proper and effective cash management in a business is of paramount importance.

Efficient and optimal cash flow management is important to all firms. "Cash is a non earning asset in the sense that although it is needed to pay for labor and raw materials to buy fixed assets, to pay taxes, to serve debt, to pay dividends

and so on. Cash management is to reduce cash holdings to the minimum necessary level to conduct business" (Weston & Copeland, 1981: 428).

Business analysts report that poor management is the major reason why most businesses fail. It would probably be more accurate to say that business failure is due to poor cash management. For this, financial manager should take a look at the cash flow process to find out. The starting point for avoiding a crisis is to develop a cash flow projection. Smart business owners know how to develop both short-term (weekly, monthly) cash flow projections to help them manage daily cash, and long-term (annual, 3-5 year) cash flow projections to help them develop the necessary capital strategy to meet their business needs. They also prepare and use historical cash flow statements to gain an understanding about where all the money went.

2.1.4 Efficiency of Cash Management:

Cash performs number of functions as it makes payment possible. It serves to meet emergencies. But if cash is kept idle it contributes directly nothing to the earning of the corporation. As such corporation must adopt such a policy that makes optimum cash management possible. The financial manager of the corporation should try to minimize the corporations holding of cash while still maintaining enough to insure payment of obligation. "For improving the efficiency of cash management effective method of collection and disbursement should be adopted. Some methods for efficiency of cash management are briefly described below". (Van Horne, 1974:426)

2.1.4.1 Speedy cash collection:

A firm can conserve cash and reduce its requirement for cash balance if it can speed up its cash collection. Reducing the lag for gap between the times a customer pays his bill can accelerate cash collection and the time the cheque is collected and funds become available for use. Within this time gap, the delay is caused by the mailing time. The amount of cheques sent by customer but not yet collected are called deposit float. The greater the deposit floats, the longer the time taken in converting cheque into usable funds. There are mainly two techniques, which can be used to save mailing and processing time which are concentration banking, lock box system.

2.1.4.2 Concentration Banking:

Concentration banking is a system of operating through number of collection centers, instead of a single collection centre centralized at the firm head office. In this system the firm will have a large number of bank account operated in the area where the firm its branches. All branches may not have the collection centers. The collection centers will be required to collect cheque from customers and deposit them in their local bank accounts. The collection centre will transfer funds above some predetermined minimum to a control generally at the firm's head office, each day. A concentration bank is one where the firm has a major bank account from which the firm makes usually the disbursement.

2.1.4.3 Slowing Disbursement:

Apart from speedy collection of account receivable the operation cash requirement can be reduce by slow disbursement of account payable. It may be recalled that a basic strategy of the cash management is delay payment as a long as possible without impairing the credit rating of the firm. In fact, slow disbursement represents a source of funds requiring no interest payments. There are some technique to delay payment is: avoidance of early payment centralized disbursement, float and accruable. Quick collection and slow disbursement accomplish the corporation with adequate cash in hand for longer periods. Effective control of disbursement can results in a faster turnover of cash. Whereas the underlying objectives of collection are maximum acceleration, the objectives in disbursements are to slow them down as much as possible.

2.1.4.4 Cash velocity:

Efficiency in the use of cash depends upon the cash velocity i.e. level of cash over a period of time

$$\text{Cash Velocity} = \frac{\text{Annual sales}}{\text{Average sales}}$$

2.1.4.5 Synchronized cash flows:

Situation in which inflow coincides with out flows, there by permitting a firm to hold transaction balance a minimum.

2.1.4.6 Using Float:

Cheque written by the firm but not deducted from the bank records until they are actually received by the bank, possible a matter of several days Slag between the times, cheques is written until the time the bank receives it is known as float.

2.1.4.7 Transferring Fund:

There are two principal method-wire transfer and electronic depository transfer cheques. With a wire an electronic depository transfer cheque (DTC) arrangement in the movement of funds, an electronic cheque image is processed through an automatic clearing house. The funds become available on business day later. From small transfer, a wire transfer may be too costly.

2.1.4.8 Minimum Cash Balance:

Corporations are required to keep a minimum cash balance requirement of a bank either for the service in record or in consideration of lending arrangement.

2.1.4.9 Overdraft System:

Systems where depositors may write cheques in excess of their balances with their banks automatically extend loans to cover the shortage. Most of the foreign countries uses over draft system.

2.1.5 DIFFERENT TECHNIQUES OF CASH MANAGEMENT

2.1.5.1 Cash planning:

Cash planning can help to anticipate future cash flows and needs of the firm and reduces the possibility of idle cash balance and cash deficiencies. Cash planning is a technique to plan for and control the use of cash. The forecasts may be based on the present operation or anticipated future operation. Cash plan is very crucial in developing the overall operation plans of the firm. Cash planning may

be done on daily, weekly or monthly basis. It depends upon the size of the firm and philosophy of management.

2.1.5.2 Cash budget:

Cash budget is the most significant device to plan and control cash receipt and payment. A cash budget is a summary statement of the firm expected cash inflows and outflows over a projected time period. This information helps the financing of these needs and exercise control the cash and liquidity of the firm.

The time horizon of cash budget may differ in various firms. A firm whose business is affected by seasonal variations may prepare monthly cash budget. Daily or weekly cash budget should be prepared for determining cash requirement. If cash flows shows extreme fluctuation, cash budget for longer interval may be prepared of cash flows are relatively stable.

2.1.5.3 Short term Cash forecasting:

There are most two common used methods of short term cash forecasting are as follows.

a. Receipt and disbursement forecast

The prime aim of receipt and disbursement forecasts is to summarize the flows during a predetermined period. In case of those companies where cash items of income and expenses involves this method is favored to keep a close control over cash.

b. Adjusted net income method

This method of cash forecasting involves the tracing of working capital flows. Sometime it is also called the sources and uses approach. Two objectives if the adjusted net income approaches are to project the company's need for cash at some future date and to show whether the company can generate this money internally or not, how much will give to either borrow or rise in the capital market. In preparing the adjusted net income forecasts items such as net income,

depreciation, taxes, dividend etc. can easily be determined from the company's annual operating budget.

2.1.5.4 Long term cash forecasting:

Long term cash forecasting are prepares to give an idle of the company's financial requirement of distant future. Once a company has developed long term cash forecast, it can be used to evaluate the impact of say new product development on the firm financial condition three, five or more years in future. The major uses of the long term cash forecasts are company's future financial needs, especially for it working capital requirement, to evaluate proposed capital projects and it help to improve corporate planning. Long term cash forecasting not only reflects more accurately the impact of any recent acquisitions but also foreshadows financing problems.

2.1.6 DETERMINING THE OPTIMUM CASH BALANCE:

Financial manager responsibilities are to maintain a sound liquidity position of the firm. So that dues may be settled in time. The firms need cash not only to purchase raw materials and pay wages but also for payment of dividend, interest, taxes and countless other purpose. The text of liquidity is really the availability of cash to meet the firm obligations when they become due. Thus the cash balance is maintained for transaction purpose and an additional amount may be maintained as a safety stock. The financial manager should determine the appropriate amounts of cash balance. A trade off between risk and return influences such a decision. If the firm maintains small cash balance, its liquidity position becomes weak and suffers from a capacity of cash to make payment. But investing released funds in some profitable opportunities can attain a higher profitability. If the firm maintains a high level of cash balance it will have a sound liquidity position but forego the opportunity to earn interests. Thus the firm should maintain an optimum cash balance to find out the optimum cash balance the transaction costs and risk of too small a balance should be matched with the opportunity costs of too large a balance. The figure shows this trade-off graphically.

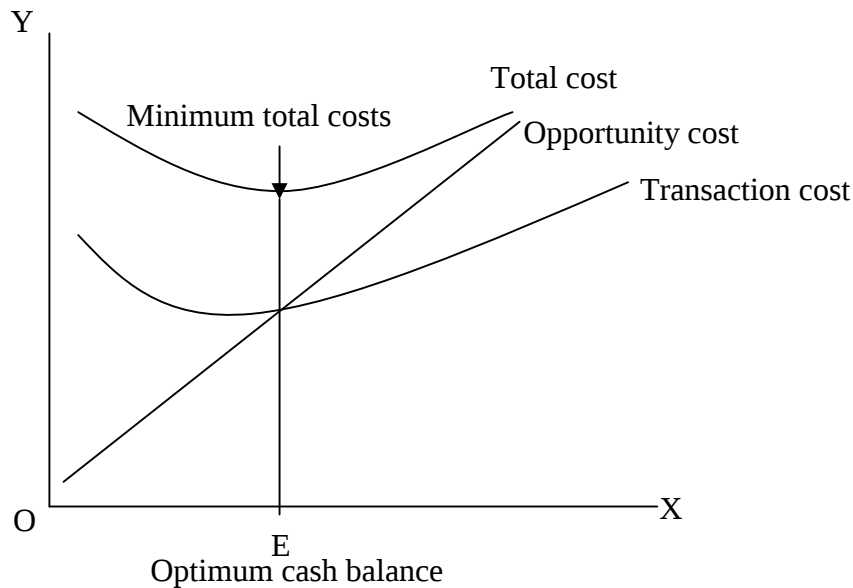


Figure no. 2-1 Determination of Optimum Cash Balance (Baumol,

If the firm maintains larger cash balances its transaction costs would decline, but the opportunity costs would increase. At point 'E' the sum of the two costs is minimum. This is the point of optimum cash balance, which a firm should seek to achieve.

2.1.7 CASH MANAGEMENT MODELS:

Optimal balance of cash is determined by the cost-benefit trade off between interest, income, transaction costs if no compensating balance were required. However, with the existence of conversion delays and positive transaction cost, the firm would prefer to hold some cash balance. There are different types of analytical models for cash management.

1. Baumol Model
2. Miller-Orr Model
3. Orgler's Model

Baumol Model

Baumol's Model, also known as Inventory model, is one of the simplest models to determine optimal cash under the condition of certainty. According to this model carrying cost of holding cash is balanced against the fixed costs of transferring marketable securities into cash or cash into marketable securities.

The purpose of this model is to determine the minimum cost amount of cash that a financial manager can obtain by converting securities to cash considering the cost of conversion and the counter-balance cost of keeping idle cash balances which otherwise could have been invested in marketable securities.

The total cash associate with cash management, according to this model, has two elements: (i) Cost of converting marketable securities into cash and (ii) the lost opportunity cost.

The conversion costs are incurred cash times marketable securities are converted into cash symbolically, total conversion cost per period.

$$=Tb/C..... (i)$$

Where,

b= cost per conversion assumed to be independent of the size of transaction

T= total transaction cash needs for the period.

C= Value of marketable securities sold at cash conversion.

The opportunity cost is derived from the lost/forfeited interest rate that could have been earned on the investment of cash balances. The total opportunity cost is the interest rate times the average cash balance kept by the firm. Symbolically, the average lost opportunity cost

$$=I(C/2)..... (ii)$$

Where,

I= Interest rate that could have been earned

C/2= Average cash balance i.e. the beginning cash plus the ending cash balance of the period divided by 2

The total cost associated with cash management compromising total conversion cost plus opportunity cost of not investing cash until it is needed in interest-bearing instruments can be symbolically expressed as

$$I(C/2+ Tb/c)..... (iii)$$

To minimize the cost, therefore the model attempts to determine the optimal conversion amount i.e. the cash withdrawal that costs the least. Symbolically, the optimal conversion (C^*) amount

$$C^* = \sqrt{2bT/i} \dots \dots \dots (iv)$$

The model in terms of equation (iv) has important implications. First, as the total cash needs for transaction rises because of expansion/diversification etc., the optimal withdrawal increases less than proportionately. This is the result of economy of scale in cash management. Each project does not need its own additional cash balance. It only needs enough added to the general cash balance of the firm to facilitate expanded operations. Secondly, as the opportunity interest rate increases the optimal cash withdrawal decreases. This is because as it increases it is more costly to forfeit the investment opportunity and financial managers want to keep as much cash invested in securities for as long as possible. They can afford to do this as the higher interest rates because at those higher rates any shortfall costs caused by a lower withdrawal are offset.

In sum, the model of cash management is very simplistic. Further, its assumption of certainty and regularity of withdrawal of cash do not realistically reflect the actual situation of any firm. In addition, the model is concerned only with transaction balances and not with precautionary balances. In addition, the assumed fixed nature of the cash withdrawals is also not realistic.

Nevertheless, the model does clearly and concisely demonstrate the economics of scale and the counteracting nature of the conversion and opportunity costs, which are undoubtedly major considerations in any financial manager's cash management strategy (Baumol, 1952:545-556).

The point on minimum cost will be justified by the following figure

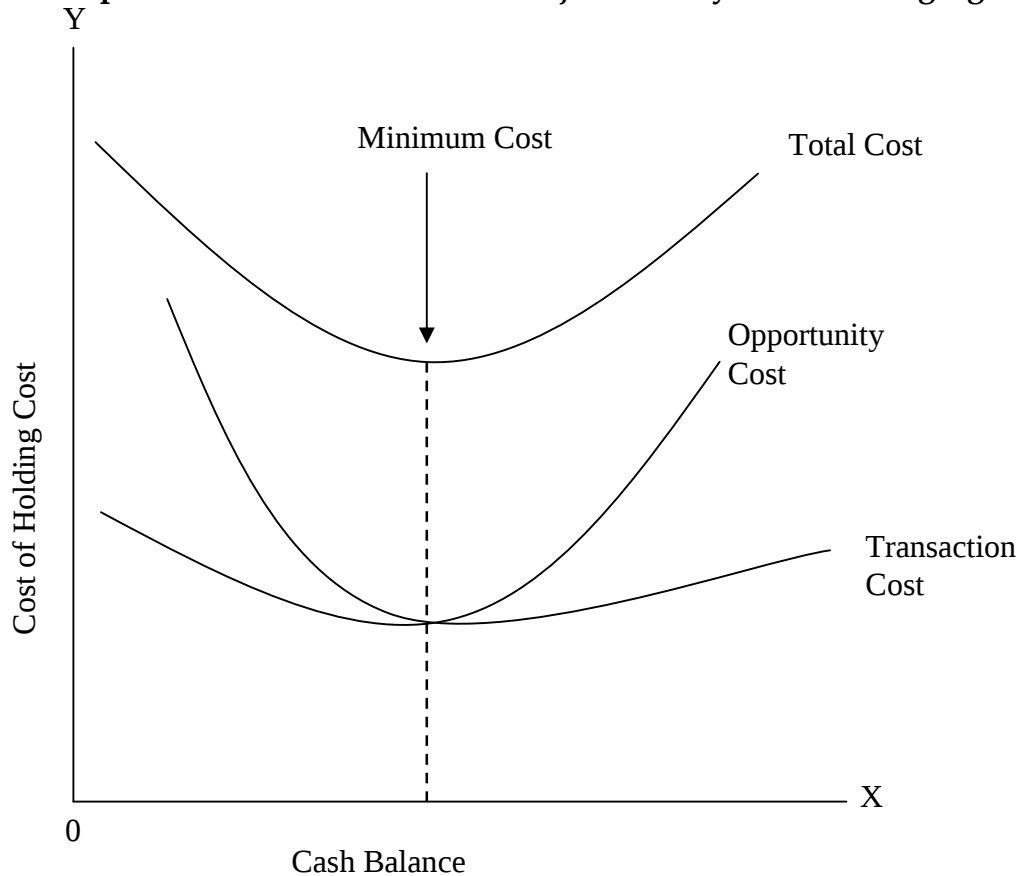


Figure no. 2-2 Baumol's Model Showing Minimum Cost of Holding Cash

$$\begin{aligned} \text{Total Cost} &= \text{Holding Cost} + \text{Transaction Cost} \\ &= (\text{Average Cash Balance} * \text{Opportunity Cost}) + (\text{Cost per Transaction} * \text{No. of Transaction}) \\ \text{Or, Total Cost} &= b (T/C^*) + I(c^*/2) \end{aligned}$$

Miller-Orr Model

When cash balance fluctuates unpredictably, we use control theory to determine optimal behavior regarding cash holdings. Stochastic model/ Miller-Orr Model assume that cash flows are uncertain and unknown in advance. Theoretically, there are number of approaches to control theory. Among them, Miller-Orr Model, which specifies two controls limited i.e. upper and lower limit.

The objective of cash management according to Miller-Orr is to determine the optimum cash balance level, which minimizes the cost of cash management.

Symbolically,

$$C = bE(N)/t + jE(M) \dots \dots \dots (i)$$

Where

b= the fixed cost per conversion.

E (M) =the expected average daily cash balances.

E (N) = the expected number of conversions.

t= the number of days in the period.

j= the lost opportunity costs.

C= total cash management costs.

The Miller-Orr model is in fact an attempt to make the Baumol model more realistic as regards the pattern of cash flows. As against the assumption of uniform and certain levels of cash balances randomly fluctuate between an upper bound (h) and a lower bound (o). When the cash balances hit the upper bound (h), the firm has too much cash and should buy enough marketable securities to bring the cash balances back to the optimal bound (z). When the cash balances hit zero, the financial manager must return them to the optimum bound (z) by selling converting securities in to cash. According to the Miller-Orr model, as in Baumol Model, the optimal cash balance (z) can be expressed symbolically as

$$Z = \sqrt[3]{(3b^2)/4i + L} \dots \dots \dots (ii)$$

Thus, as in Baumol model, there are economies of scale in cash management and the two basic costs of conversion and the lost interest that have to be minimized. Miller-Orr model also specifies the optimum upper boundary (h) as three times the optimal cash balance level such that

$$\text{Upper Limit (h)} = 3Z - 2L \dots \dots \dots (iii)$$

$$\text{Average Cash balance} = (h + Z)/3$$

Further, the financial manager could consider the use of less liquid, potentially more profitable securities as investments for the cash balances in excess of cash (Miller & Orr, 1966:413-435).

Orgler's Model

According to this model, an optimal cash management strategy can be determined through the use of a multiple linear programming model. The constrictions of the model comprise three sections:

- a) Selection of the appropriate planning horizon
- b) Selection of the appropriate decision variables
- c) Formulating of the cash management strategy itself

The advantage of linear programming model is that it enables co-ordination of the optimal cash management strategy with the other operations of the firm such as production with less restriction on working capital balances. The model basically uses one-year planning horizon with twelve month periods because of its simplicity. It has four basis sets of decisions variables which influence cash management of a firm and which must be incorporated into the linear programming model of the firm. These are: (i) payment schedule, (ii) short term financing, (iii) purchase and sale of marketable securities and (iv) cash balance itself.

The formulation of the model requires that the financial manager first specify an objective function and then specify a set of constraints. Orgler's objective function is to minimize the horizon value of the net revenues from the cash budget over the entire planning period using the assumption that all revenue generated is immediately re-invested and that any cost is immediately financed. The objective function recognizes each operation of the firm that generates cash inflow or cash outflows as adding or subtracting profit opportunities for the firm is cash management operations. In the objective function decision variables which cause inflows such as payments on receivables have positive co-efficient, while decision variables which generate cash inflows, such as interest on short-term borrowings have negative co-efficient. The purchase of marketable securities would for example produce revenue and they have a positive co-efficient while the sale of those securities would incurred conversion costs and have a negative co-efficient. A very important feature of this model is that it allows the financial managers to generate cash management with production and other aspects of the firm (Orgler: 1970:305).

2.1.8 CASH CONVERSION CYCLE

Cash conversion cycle, also known as asset conversion cycle, net operating cycle or just cash cycle, is a ratio used in the financial analysis of a business. The higher the number, the longer a firm's money is tied up in operations of the business and unavailable for other activities such as investing. The cash conversion cycle

is the number of days between purchasing raw materials and receiving the cash from the sale of the goods made from that raw material.

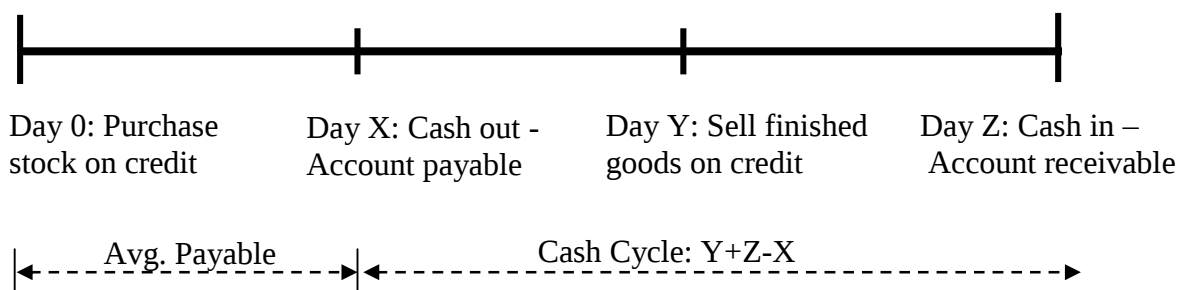
Cash conversion cycle = Average stockholding period (in days) + Average receivables processing period (in days) – Average payable period (in days)

Where,

Average stockholding period (in days) = closing stock / average daily purchases.

Average receivables processing period (in days) = accounts receivables / average daily credit sales.

Average payable processing period (in days) = accounts payable / average daily credit purchases.



The duration between the purchase of a firm's inventory and the collection of accounts receivable for the sale of that inventory, also known as cash cycle.

Cash Conversion Cycle = Inventory Processing Period + Days to Collect Receivables.

2.1.9 CREDIT MANAGEMENT:

Credit policy can have significant influences on sales. In theory, the firm should lower its quality standard for accounts accepted as long as the profitability of sales generated exceeds the added costs of receivable is determined by the volume of credit sales and the average period between sales and collection.

Firm's objective of credit management is not only to collect receivable promptly, but also to give an outlook to the benefit cost trade off involve in various aspects of accounts receivable management. The important criteria to maintain benefit cost trade off the firm's receivable management are to set up credit policies. A

firm's policy provides guidelines for determining whether to expand credit to a customer and how much credit should be given to the customer. Collection policies decision includes three dimensions.

I) Credit Standards

- a) Sales revenue
- b) Investment in accounts receivable
- c) Bad debt expenses

II) Credit Terms

- a) Cash discounts
- b) Cash discount period
- c) Credit period

III) Collection Policies

- a) Correspondence
- b) Telephone calls
- c) Personal visits
- d) Legal action

2.1.10 CASH FLOW:

Cash flow simply refers to the flow of cash into and out of a business over a period of time. Watching the cash inflows and outflows is one of the major management tasks of an owner. The outflow of cash is measured by those cheques of transactions that will write every month to pay salaries, suppliers, and creditors. The inflows are the cash, which receive from customers, lenders and investors. Positive cash flow means the cash coming "in" to the business is more than the cash going "out" of the business; the company has a positive cash flow. A positive cash flow is very good and the only worry here is what to do with the excess cash. Negative cash flow means the cash going "out" of the business is more than the cash coming "in" to the business; the company has a negative cash flow. A negative cash flow can be caused by a number of reasons. For example: too much or obsolete inventory or poor collections of accounts receivable can be the cause of short of cash. If the company can't borrow additional cash at this point, the company may be in serious trouble.

A Cash Flow Statement is typically divided into three components. These components are stated below:

Operating Cash Flow:-

Operating cash flow, often referred to as working capital, is the cash flow generated from internal operations. It is the cash generated from sales of the product or service of business. It is the real lifeblood of business, and because it is generated internally, it is under our control.

Investing Cash Flow:-

Investing cash flow is generated internally from non-operating activities. This component would include investments in plant and equipment or other fixed assets, nonrecurring gains or losses or other sources and uses of cash outside of normal operations.

Financing Cash Flow:-

Financing cash flow is the cash that flows to and from external sources; such as lenders, investors and shareholders. A new loan, the repayment of a loan, the issuance of stock and the payment of dividend are some of the activities that would be included in this section of the cash flow statement.

2.1.11 CASH FLOW PROJECTION

A cash flow projection is a forecast of the difference between cash coming “in” the business and cash going “out” of the business. The estimation or projection of cash flow is a powerful management tool for business. If we were to choose one financial management tool that we use on a routine basis, the cash flow projection and cash flow analysis would be the one to choose.

By knowing your cash position now and in the future, you can:

- a) Make sure business have enough cash to purchase sufficient inventory for seasonal cycles;
- b) Take advantage of discounts and special purchases;
- c) Properly plan equipment purchases for replacement or expansion;
- d) Prepare for adequate future financing and determine the types of financing (short-term credit line, permanent working capital, or long-term debt).
- e) Impress lenders with ability to plan and repay financing.

Moreover, it just makes good business sense to know where you are and where you are going with your company. A cash flow projection can help to do this. For a new or growing business, the cash flow projection can make the difference between success and failure. For an ongoing business, it can make the difference between growth and stagnation.

The cash flow projection shows how cash will flow in and out of the business and enables firms to budget the cash needs of the business over a period of time. The ability to predict and plan cash outlays means that firms won't be forced to resort to unexpected borrowing to meet your cash needs. The lack of liquidity can be a killer- even for profitable business. Lack of profits won't kill a business nearly as quickly as the lack of cash to pay your trade creditors. Remember, non-cash expenses such as depreciation can make your profits look negative, while your cash flow is positive. And you could also be showing a profit but have negative cash flow. That's why it is essential that we understand how to use a cash flow statement, and use it on a regular basis.

Preparing a cash flow projection is a something like preparing budget and balancing checkbook at the same time. Unlike the income statement, a cash flow statement deals only with actual cash transactions. Depreciation, a non-cash transaction, does not appear on a cash flow statement. Loan payments (both principal and interest) will appear on your cash flow statement since they require the outlay of cash.

Cash is generated primarily by sales. In most of the businesses, not all sales are cash sales. Even if firm's have a retail business and a large percentage of sales are cash, it is likely that firm offer credit (charge accounts, term payments, lay-a-way, and trade credit) to customers. Thus, we need to have a means of estimating when those credit sales will turn into cash-in-hand. Cash flow projections should be prepared for short-term (weekly, monthly), and long-term (annual, 3-5 years) planning purposes. They are used for deficient purposes and thus are generally prepared differently.

2.1.12 CASH FLOW STATEMENT (CFS)

The Cash Flow Statement attempts to analyze the transactions of the firm in terms of cash i.e., the transactions generating cash and using cash. The focus in the cash flow statement is on cash rather than on working capital. So, the CFS provides a summary of sources of cash and uses of cash in the firm. The sources of cash may be the cash profits earned by the firm, issue of capital for cash, issue of other securities for cash, borrowings, sale of assets or investments etc. The uses of cash may be purchase of assets, investment, and redemption of debenture or preference share, repayment of loan, payment of tax, dividend distribution etc. The excess of sources of cash over the uses of cash would be the increase in cash during the year and vice-a-versa. Thus, the CFS summarizes the cash inflows and outflows. (Rustagi, 2001:155)

2.1.13 Revenue Planning:

Revenue planning is the future estimation of revenue which displays the projected sales, income and future cash inflow. In other word, revenue planning is the projection of future income in advance for a specific period. Revenue plan provides the basis for management decision about marketing and other activities. It can be said that it is an organized approach for developing a comprehensive sales plan.

The revenue planning estimates are only a guide to the level of future revenues, not a guarantee. If the economy remains strong, the planning estimates are likely to underestimate future revenues. But, if the economy fails to perform at the high level anticipated in the control, the planning estimates will overstate future revenues.

“The revenue planning process is a necessary part of PPC because (a) it provides for the basic management decisions about marketing, and (b) based on those decisions, it is an organized approach for developing a comprehensive sales plan. If the revenue plan is not realistic, most if not all of the other parts of the overall profit plan also are not realistic. Therefore, if the management believes that a realistic revenue plan cannot be developed; there is little justification for PPC. Despite the views of a particular management, such a conclusion may be an implicit admission of incompetence. Simply, if it is really impossible to assess the

future revenue potential of a business, there would be little incentive for investment in the business initially or for continuation of it except for purely speculation ventures that most managers and investors prefer to avoid". (Welsch, Hilton, Gordon, 2000:171).

"The company earns profit only when it is able to sell its product and not when it produces them. It is no use of producing goods that are not likely to be sold and for which there is a limited demand. In some business, it is necessary to establish that the product will sell even before it is produced. In normal times of keen competition, the sales forecast must be realistic. It is undoubtedly true that past can provide experience and information which will be an assistance in estimating present and future revenue but care must be taken in presenting past facts to management so that incorrect conclusions may not be drawn there from" (Mohan, Goyal, 1992:10).

"The revenue plan should be designed to coordinate the efforts of the sales department, production department and all other departments. Many factors must be considered when sales budget is established, including sales trends, limitations on the supply of merchandise or the company's market, competing products, the expected amount of advertising, and general level of the economy. Since most of these unknown companies frequently maintain a specially trained staff to increase them" (Seiler & Robert, 1964:659-660).

"The logical starting point in developing the revenue planning is the estimates of sales. It does not follow, however, that the revenue estimation can be considered in isolation or that once the revenue estimates has been computed, the other elements of revenue and expenses will fall into place. There is circular relationship between sales and some expenses. In fact, the level or amount of certain expenses may have a considerable influence on the revenue. For example: the relationship between advertising and sales" (Finney, Miller, & Herbert 1963:389).

2.1.14 FACTOR INFLUENCING REVENUE PLANNING

The factors influencing the level of revenues may be classified as internal and external as follows:

2.1.14.1. Internal Factors

These include promotional aids, such as advertising, incentives to sales man, ability of the organization to satisfy demand, quantity of the finished product, changes in price etc.

2.1.14.2. External Factors

These include the fluctuations in the size of population, the general level of prosperity, the extent and severity of competition in the market, government policy and regulation. Changes in fashion and tastes, degree of competition expected from new product etc. Elasticity of demand for the product is of obvious importance if prices are expected to undergo a change (Varma & Agrawal, 1996:329-330).

2.1.15 PREPARATION OF REVENUE PLANNING.

A planner should complete the following steps for planning the revenue. They are listed below:

2.1.15.1. Development of Management Guidelines for Sales Planning:

All the management particularly in the sales planning process should be provided with specific management guidelines to be followed in revenue planning. Fundamentally, these guidelines should specify revenue-planning responsibilities. The purpose of these guidelines is to attain coordination and uniformity in the revenues planning process. The guidelines should emphasize enterprise objective, goals, and sales strategies. The guideline also should direct attention to such areas as product emphasis, general pricing policies, major marketing strategies, and competitive position.

2.1.15.2. Sales Forecast:

One or more sales forecasts should be prepared. Each separate forecast should use different assumption, which should be clearly explained in the forecast. The management guidelines should provide the broad assumptions. Forecasting methods are broadly classified as a) quantitative b) technological c) judgmental. These forecasting methods include time-series smoothing, decomposition for time series, advanced time series, simple & multiple regression, and modeling. The forecasts should include strategic and tactical forecasts that are consistent with the time dimension.

2.1.15.3. Assemble Other Relevant Data:

In addition to step1 and step2, all other information relevant to developing a realistic revenue plan should be collected and evaluated. This information should relate to both constraints and opportunities. The primary constraints that should evaluate are: a) manufacturing capacity b) sources of raw materials and supplies, or goods for resale, c) availability of key people and a labor force, d) capital availability and e) availability of alternative distribution channels. These five factors require evaluation and coordination among the heads of the various functional areas in developing a realistic revenue plan.

2.1.15.4. Develop the Strategic and Tactical Sales:

Using the information provides in step 1, 2&3, the management develops a comprehensive revenue plan to do this, the planning process must be structured to maximize a) motivation of the sales force and b) realism in the revenue plan. This process should recognize the importance of management goals both strategic and tactical. The process of developing a realistic revenue plan should be unique to each company because of the company's-its products, its distribution channels, and the competence of its marketing group. Four different participative approach widely used are characterized as follows; a) sales force composite b) sales division manager's composite c) executive decision and d) statistical approaches.

2.1.15.5. Securing Managerial Commitment to Attain the Goals in the Comprehensive Revenue Plans.

Top management must be fully committed to attaining the sales goals that are specified in the approved revenue plan. This commitment requires full communication to the sales manager of the goals: approved marketing plan and strategies by sales responsibilities. The commitment must be strong and ever present in day-to-day operations (Welsch, Hilton, & Gordon, 1999:176-182).

2.2 Review of Previous Thesis:

Joshi (2004) has made research on Revenue Planning and Cash Management of NEA. In this study Mr. Joshi has pointed out following objectives and major findings.

Objectives:-

1. To examine revenue planning, policies and practices of NEA;
2. To analyze the relationship between sales and production;
3. To make comparative study of revenue generation of NEA from different sector;
4. To review cash flow from operating, financing, and investing activities;
5. To make suggestion effective of revenue mobilization of NEA;

Major Findings:-

1. NEA has a practice to increase 10 percent in past year figure to forecast next year's figure as a basis for forecast.
2. Average achievement of actual sales unit is consistent with internal sale but higher in external sales. It indicates that the budgeted sales planning is less consistent with external sales market. Similarly, average achievement of sales revenue is also satisfied and highly consistent with internal and very small difference in external.
3. Category-wise revenue analysis of NEA shows that the achievement in domestic, non-commercial, commercial, streetlight, temple categories are more heterogeneous than budgeted. Community sale achievement is too high. It means there is some problem in planning.
4. Category-wise analysis of NEA shows that the major contribution of domestic and industrial categories to consumption of sales unit and increased in sales revenue.

5. Cash position of NEA shows that the cash from operating activities is in decreasing trend. It means, operating cost of NEA is too high. Similarly, the cash from investment activities is in highly increased up to 2057/58. Thereafter decreased but its return is very poor. It indicates that the utilization of assets is very poor. The cash from financing activities is highly increased in F.Y 2056/57. Thereafter, it is decreased.

Dahal (2005) has made research on Profit Planning System & Financial Conditions of NEA. In this study Mr. Dahal has pointed out following objectives and major findings.

Objectives:-

1. To examine the present planning premises adopted by NEA on the basis of budgeting;
2. To observe the NEA's profit planning on the basis of overall managerial budgeting;
3. To analyze the variances between budgets & actual achievement of the authority;
4. To assess the financial performance of NEA;
5. To recommend measures to be taken instantly and further to encounter with the identified budgeting and profit planning problems;

Major Findings:

1. There is positive and perfect correlation between budget and achievement of NEA is higher than the budgeted sales.
2. NEA has a practice of preparing both strategic long-range and tactical short-range profit plan.
3. Actual sales are less than actual production and it indicates the remarkable loss of power in NEA.
4. Total assets turnover ratio, profitability ratio and return on net capital employed ratio are not perfectly satisfactory.
5. There is perfect positive correlation between actual sales and actual production.

Bhatta (2006) has made research on Revenue Planning and Cash Management of Public Utility in Nepal, a case study of Nepal Telecom. In this study Mr. Bhatta has pointed out following objectives and major findings.

Objectives:-

- i) To analyze the gap between budgeted and actual revenue and its demand;
- ii) To examine cash collection and disbursement;
- iii) To review cash flow from operating, financing and investing activities;
- iv) To have information, control and security over cash balances and payment systems;

Major Findings:-

- i) Sales budget shows ISD sector's sales revenue is main revenue sources of Nepal Telecom, which contributes more than 40% in average.
- ii) Because of high demand of Telephone line there exist small gap between actual production and actual sales in lines.
- iii) Correlation and coefficient value shows that there are positive correlation between budgeted and actual sales units and Rs. By the regression line, it is clear that future revenue will increase with compare to budgeted if other things remaining same.
- iv) Revenue per employee is increasing trend but Nepal Telecom has not incentive or motivating planning to promote employees.
- v) The collection of receivable from the customers in the company is very small decreasing year by year. It denotes efficiency of Nepal Telecom to collect its revenue in time. But A/R is low increasing in F/Y 2059/60. The decreasing trend of average collection period has shown the improvement of credit management and strict credit policy of the company.

Neupane (2007) has made research on A Study of Cash Management in Nepalese Public Enterprises, a case study of Salt Trading Corporation Ltd.; In this study Mr. Neupane has pointed out following objectives and major findings.

Objectives:-

- i) To avail the daily necessary things to the general people in the reasonable price;
- ii) To carry out the export and import business;
- iii) To act as an agent for domestic as well as foreign companies;
- iv) To make investments in new as well as old industries;
- v) To import and distribute chemical goods and fertilizer;

Major Findings:-

- i) **Cash Management in the STCL is primary based on the traditional practices lacking in scientific approach. A more serious aspect of cash management has been the absence of any formalized system of cash planning and cash budgeting in STCL.**
- ii) The STCL could not make the best use of available cash balance prudently.
- iii) The average cash turnover time in a year is found 40 times which is in fluctuating trend over the study period.
- iv) Management has taken liberal credit policy to sales of goods. Hence, the cash and bank balance of the study period is minimal of account receivable.
- v) Modern practices with respect to debt collection, monitoring the payment behavior of customers and relevant banking arrangements in connection with collection of receivables have been virtually ignored in STCL.
- vi) No optimum cash balance is maintained. The cash & bank balance with respect to current assets has been fluctuating trend similar is the case with respect to the total assets.

Thapa (2008) has conducted a research on the topic " Profit planning and control: A case study of Nepal Telecom. Mr. Thapa has pointed out the following objectives and major finding.

The main objectives of the study were.

- 1) To examine the present comprehensive profit planning system applied by NTC.
- 2) To evaluate the targeted variable and actual variables of NTC.
- 3) To analyze the gap between budgeted and actual revenue.
- 4) To examine the financial performance the NTC.

The major findings were as follows.

- 1) NTC is lacking the proper System of Performance report.
- 2) NTC has not practices of control policy considered controllable and insoluble variables affecting the organization.
- 3) The sales plan and achievement is satisfactory to some extent.
- 4) Financial Performance of NTC is not so good.
- 5) NTC does not consider the use of flexible subjective.

Shrestha (2009) has made research on Profit Planning in Public Utility Sector of Nepal – A case study of NEA. In this study Mr. Shrestha has pointed out following objectives and major findings.

Objectives:-

1. To examine profit planning system applied by NEA;
2. To analyze the financial performance of NEA by using various financial tools;
3. To observe the various functional budgets of NEA associated with comprehensive profit planning;
4. To evaluate budgeted and actual achievement of NEA;
5. To provide a package of recommendations and suggestions to be taken instantly and further to be encountered with identified budgeting & profit planning problems on the basis of findings;

Major Findings:-

1. Budgeted sales are more variable than actual sales.
2. Budgeted production is more fluctuating than actual production.
3. Authority formulates various functional budgets as a part of comprehensive profit plan.
4. NEA has been paying a large amount of interest on long term loan.
5. Power leakage is significantly high in NEA.

Upreti, (2010) has conducted a research on the topic " Profit Planning and Control in Agriculture Development Bank Limited". Mr. Upreti has pointed out the following objectives and major findings.

The main objectives were as follows.

- 1) To study and examine the financial performance of ADBL.
- 2) To analyze the various functional budget.
- 3) To evaluate present planning adopted by the bank.
- 4) To examine the variance between estimated and actual profit of the bank.
- 5) To provide suggestions for improvement in the overall profitability of the bank on the basis of study results.

The major findings of the study were as follows.

- 1) Specific goal and financial targets are not defined clearly to achieve the basis objectives of the bank.

- 2) The decision making process is highly centralized.
- 3) The bank has not practiced the short term and long term planning properly.
- 4) The revenue targets, in most of the year are under estimated. As a result there is high difference between target revenue and revenue achievement.
- 5) Actual revenue of the bank in the last years is in increasing trend, which shows the positive sign of the bank.
- 6) There is inadequate profit planning due to lack of planning experts.
- 7) Political situation is the major affecting factor to the banking activities.
- 8) Lack of investment in the productive sector, fluctuation of liquidity in the market, competition in the banking sector, strike, lockout and unsuitable situation within country are also the major affecting factors to the banking activities.
- 9) Advanced training to the personnel is lacking.
- 10) Controlling functions of the branches are so far being carried out directly by head office, which may be difficult in the days to come because of its wide geographical coverage.
- 11) Bank's deposit collection is continuously increasing but loan disbursement is in decreasing trend.
- 12) Interest income of the banks is the highest among income items of the bank every year.

2.3 Research Gap

This topic is also called the difference between the previous researches and the current research. Most of the past research studies are about profit planning system of public enterprise. The previous researches did not disclose which of the profit planning and control tools are in practices and which are not and why? The researcher could find only three research study so far that has been related to revenue planning of NEA. But these research studies were not analyzed the cash management system of NEA. So, there exists a research gap between the present and past researches. This research is conducted to fill up this research gap.

This research is a case study research. It is mainly based in secondary data. This study has tried to indicate the role of revenue planning and cash management and how effectively NEA is practicing the revenue planning and cash management system. This study has analyzed the financial position of NEA by applying the tools of ratio analysis and other mathematical and statistical tools.

Finally it concludes the various findings of research and recommendations of NEA.

CHAPTER -III

RESEARCH METHODOLOGY

3.1 Introduction

Research simply means to search again and again. It is a systematic activity to achieve truth or finding solution to a problem. It is a process of a systematic and in-depth study or research of any particular topic, subject or area of investigation backed by the collection, compilation, presentation and interpretation of relevant details or data. Methodology is the research method used to test the hypothesis. So the research methodology refers to the overall research process, which a researcher conducts during his/her study. "The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find the truth which is hidden and which has not been discovered at yet." (Kothari, 1990:7)

3.2 Research Design

Research design is an organized approach and not a collection of loose unrelated parts. It is an integrated system that guided the researcher in formulating, implementing and controlling the study. Research design in the plan, structure and strategy of investigations conceived so as to obtain answers to the research question and to control variances. The study is based on secondary sources of data so descriptive and analytical research design has been used.

3.3 Population and Sample

Population refers to the entire group of people, events, or things of interest that the researcher wishes to investigate. Or the population means the large group from the samples is drawn. The large group about which the generalization is made is called the population under study, or the universe, and small portion on which the study is made is called the sample of the study. The present public enterprises are the population of the study and NEA is selected as sample for the evaluation. Similarly, financial statements of years (beginning from the fiscal year 2005/06 to 2009/10) are covered as sample for the purpose of the study.

3.4 Nature and Sources of Data

The data used in this study are secondary in nature. Published annual reports of the concerned companies are taken as basic source of data. The data relating to financial performance are directly obtained from NEA. Similarly, related books, magazines, journals, articles, reports, bulletins, data from Nepal Stock Exchange and Nepal Rastra Bank, Central Bureau of statistics, related website from internet etc. as well as other supplementary data and various economic surveys are also used. Previous related studies to the subject are also counted as source of information.

3.5 Data Gathering Procedure

Since the data have been obtained from secondary sources, after collection of financial statement, master sheet of financial data have been extracted and tabulated as per the need of this study. In order to process the data, financial statement and other available information were reviewed. These data were grouped in different tables and charts according to their nature. Most of the data have been compiled in one form and processed and interpreted as required.

5.6 Data Processing and Presentation

The information and data obtained from the different sources are in row form. From that information, direct presentation is not possible. So it is necessary to process data and converts it into required form. After then only, the data are presented for this study. This process is called data processing. For the study, only required data are taken form the secondary source and presented likewise, in some case graphical presentation is also made. For presentation, different tables are used. Likewise, in some case graphical presentation is also made. The calculations that are related to this study are done with the help of scientific calculator as well as computer software program.

3.7 Research Variables

Sales revenue, production (telephone line capacity installation) capacity utilization, profit & loss, total assets, profit margin, total capital employed, account receivable (debtor), cash flows, capital expenditures relating to long term and short period of NEA were the research variables of this present study.

3.8 Tools and Techniques Employed

This research was confined to examine the revenue planning and cash management of NEA. Therefore, the collected data were presented and demonstrated in suitable tables, formats, diagrams, graph and charts. Such presentations were interpreted and explained whenever necessary. To analyze the secondary data collected from various sources different financial, statistical and mathematical tools are used.

The financial tools used were - net fixed to total assets turnover ratio, debtor turnover ratio, average collection period, sales to capital employed & working capital ratio, revenue per employee ratio, operating expenses ratio, operating profit ratio, net profit ratio, return on assets and return on equity ratio, cash flows, optimal cash models, budget, analysis of cash turnover, account receivable to cash and bank balance, break even analysis etc.

The statistical and mathematical tools used were - average, standard deviation, coefficient of variation, correlation coefficient regression analysis, percentage and mean etc. All the data and information were collected from secondary sources which were properly synthesized, arranged, tabulated and calculated to serve the objectives of the study.

CHAPTER -IV

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

This chapter deals with data presentation, analysis and interpretation following the research methodology presented in the third chapter. Data presentation and analysis are the central steps of the study. The main purpose of this chapter is to analyze and elucidate the collected data to achieve the objective of the study following the conversion of unprocessed data to an understandable presentation. The chapter deals with the main body of the study.

4.2 Analyses of Financial Ratio

A ratio is a relationship expressed in mathematical terms between two individual or groups of figures connected with each other in some logical manner. The ratio analysis is based on the premise that a single accounting figure by itself may not communicate any meaningful information but when expressed as a relative to some other figure, it may definitely give some significant information. The relationship between two or more accounting figures/groups is called a financial ratio. A financial ratio helps to summarize a large mass of financial data into a concise form and to make meaningful interpretations and conclusions about the performance and positions of a firm. The ratios can be studied by classifying into the following groups (Source: R.P. Rustagi, 2001: 53).

- I. Liquidity Ratios
- II. Leverage Ratios
- III. Activity or Turnover Ratios
- IV. Profitability Ratios

4.2.1 LIQUIDITY RATIOS

The liquidity refers to the maintenance of cash, bank balance and those assets which are easily convertible into cash in order to meet the liabilities as and when

arising. So, the liquidity ratios study the firm's short term solvency and its ability to pay off the liabilities. It should be intuitive to observe that a firm, no matter how profitable it is, cannot continue to exist unless it is able to meet its obligations as they arise. The day to day problems of financial management consists of highly important task of finding sufficient cash to met current obligations. To the extent that the firm has to make payments to its suppliers before it is paid for the goods and services it provides, a cash short fall has to be met, usually through the short term borrowings. Although this financing of working capital needs is routinely done in most firms, the liquidity ratios have been devised to keep a track on the extent of the firm's exposure to the risk that it will not be able to meet its short term obligations.

These ratios as a group are intended to provide information about a firm's liquidity and the primary concern is the firm's ability to pay its current liabilities. Consequently, these ratios focus on current assets and current liabilities. The liquidity ratios provide a quick measure of the firm by establishing a relationship between its current assets and its current liabilities. If a firm does not have sufficient liquidity, it may not be in a position to meet its commitments and thereby may loose its credit worthiness. The liquidity ratios are also called the balance sheet ratios because the information required for the calculation of liquidity ratios is available in the balance sheet only. Some of the common liquidity ratios are as follows.

A. Current Ratio:

Current ratios show the relationship between current assets and current liabilities. The current ratio is a measure of firm's short term solvency. It indicates the availability of currents assets in rupee for every of current liability. In other words it is an indicator of firm's ability to meet its short term obligation. It is also known as short term solvency ratio or working capital ratio. Generally current ratio of 2 times or 2:1 is considered to be satisfactory. The table below presents current ratio of NEA from fiscal year 2005/06 to 2009/10.

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Appendix – I

Budgeted sales are assumed to be independent variable and denoted by ‘X’. Actual sales are assumed as dependent variable and denoted by ‘Y’. Now, calculation of arithmetic mean, standard deviation, co-efficient of variation, correlation co-efficient, co-efficient of determination and probable of error of correlation between budgeted sales and actual sales achievements of NEA.

Fiscal Year	Budgeted Sales (X) (in Rs ‘00000’)	Actual Sales (Y) In Rs ‘00000’	$x = (X - \bar{X})$	x^2	$y = (Y - \bar{Y})$	y^2	xy
2005/06	11521.4	9687.65	-1302.93	1697637.01	-2351.352	5528856.23	3063656.47
2006/07	12238.8	11237.5	-585.53	342845.381	-801.512	642421.486	469309.321
2007/08	12825.7	11992.6	1.402	1.965604	-46.392	2152.21766	-65.041584
2008/09	13275.4	13264.4	451.053	203448.809	1225.358	1501502.23	552701.402
2009/10	14260.3	14012.9	1436.009	2062121.85	1973.898	3896273.31	2834535.29
	$\sum X = 64121.7$	$\sum Y = 60195$	$\sum x = 0$	$\sum x^2 = 4306055.01$	$\sum y = 0$	$\sum y^2 = 11571205.5$	$\sum xy = 6920137.44$

A) Budgeted Sales (X):

- a. Arithmetic Mean $(\bar{X}) = \frac{\sum X}{n} = \frac{641221.70}{5} = 12824.33$
- b. Standard Deviation $(s_x) = \sqrt{\frac{\sum x^2}{n}} = \sqrt{\frac{4306055.01}{5}} = 928.01$
- c. Coefficient of Variation $(C.V._x) = \frac{s_x}{\bar{X}} \times 100 = \frac{928.01}{12824.33} \times 100 = 7.24\%$

B) Actual Sales

- a. Arithmetic Mean $(\bar{Y}) = \frac{\sum Y}{n} = \frac{60195}{5} = 12039.002$

$$\text{b. Standard Deviation } (s_y) = \sqrt{\frac{\sum y^2}{n}} = \sqrt{\frac{11571205.5}{5}} = 1521.263$$

$$\text{c. Coefficient of Variation } (C.V._y) = \frac{s_y}{\bar{Y}} \times 100 = \frac{1521.263}{12039.002} \times 100 = 12.63 \%$$

C) Coefficient of Correlation (r) between budgeted sales and actual sales achievement

We have,

$$\begin{aligned} \text{Coefficient of Correlation } (r) &= \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{6920137.44}{\sqrt{4306055.01} \times \sqrt{11571205.5}} \\ &= \frac{6920137.44}{2075.10 \times 3401.65} = 0.9804 \end{aligned}$$

$$\text{D) Coefficient of Determination } (r^2) = (0.9804)^2 = 0.9612$$

$$\begin{aligned} \text{E) Probable Error of Correlation Coefficient } P.E.(r) &= 0.6745 \times \frac{1-r^2}{\sqrt{n}} \\ &= 0.6745 \times \frac{(1-0.9612)}{\sqrt{5}} = 0.0117 \end{aligned}$$

$$\begin{aligned} \text{F) Standard Deviation of Actual Sample} &= \sqrt{\frac{\sum y^2}{n-1}} \\ &= \sqrt{\frac{11571205.5}{5-1}} = 1700.82 \end{aligned}$$

Appendix 2
Category-wise Achievement of Sales Units (%) of NEA

(Figure in million)

	2005/06			2006/07			2007/08			2008/09			2009/10		
	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %
Domestic	600.00	557.94	92.99	648.60	617.11	95.19	689.40	676.37	98.11	750.00	730.83	97.44	815.00	810.1	99.41
Non Commercial	81.00	78.22	96.57	90.00	80.74	89.71	92.43	83.01	89.81	112.00	91.34	81.56	115.00	101.03	87.85
Commercial	103.60	90.43	87.28	110.00	92.74	84.31	110.00	108.12	98.29	107.00	107.44	101.41	111.70	123.45	110.52
Industrial	605.00	596.68	98.62	660.00	629.51	95.38	677.90	689.80	101.76	725.00	763.77	105.35	832.05	803.35	96.55
Water Supply & Irrigation	31.50	29.28	92.96	37.00	29.98	81.04	33.15	31.67	95.54	43.00	36.12	83.99	44.00	42.73	97.11
Street Light	40.70	39.52	97.09	45.00	50.80	101.78	43.00	55.20	128.36	60.00	57.84	96.41	58.50	64.88	110.91
Temporary Supply	0.90	0.28	31.33	0.50	0.35	69.60	0.29	0.25	86.55	0.35	0.39	112.57	0.53	0.73	137.74
Transport	6.50	5.64	86.69	7.00	5.53	79.00	7.20	5.47	75.99	7.00	5.72	81.64	6.00	5.98	99.67
Temple	2.80	2.48	88.43	2.80	2.81	100.39	2.98	4.11	137.95	4.50	4.20	93.42	5.20	4.91	94.42
Community Sales	0.50	5.72	1143.4	4.00	4.74	118.50	5.00	5.58	111.62	6.00	8.17	136.20	7.50	8.02	106.93
Bulk Supply (India)	170.00	133.86	78.74	200.00	192.25	96.12	245.27	141.24	57.58	164.00	112.53	68.62	140.00	101.00	72.14

Category-wise Achievement of Sales Ruppes (%) of NEA

(In Rs. million)

	2005/06			2006/07			2007/08			2008/09			2009/10		
	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %	Budget ed	Actual	Achiev ement %
Domestic	4218.0	3641.4	86.33	4592.0	4249.8	92.55	4770.6	4578.9	95.98	5082.8	7987.0	98.12	5444.2	5363.5	98.52
Non Commercial	827.8	722.12	87.23	900.0	783.99	87.11	924.3	816.0	88.28	1058.9	862.4	81.44	1083.3	929.5	85.80
Commercial	1046.4	818.75	78.25	1089.0	894.91	82.18	1089.0	986.0	90.55	999.7	1012.7	101.29	1037.7	1138.2	109.69
Industrial	4368.1	3608.1	82.60	4290.0	4039.6	94.16	4419.9	4380.2	99.10	4605.9	4799.7	104.21	5283.5	5061.1	95.79
Water Supply & Irrigation	157.82	138.68	87.88	188.30	148.53	78.88	162.53	154.8	95.25	260.7	211.6	81.16	258.3	196.6	76.12
Street Light	197.4	200.74	101.69	236.25	246.79	104.46	225.75	329.5	145.97	342.3	314.1	91.77	336.4	373.1	110.91
Temporary Supply	11.93	3.63	30.44	6.75	4.74	70.22	3.92	3.46	88.38	4.7	5.1	107.09	7.4	9.8	132.88
Transport	32.18	27.90	86.71	38.50	29.29	76.08	39.60	28.94	73.08	36.8	30.7	83.46	31.5	30.5	96.83
Temple	14.06	12.16	86.51	14.00	14.24	101.71	14.90	20.80	139.60	22.8	29.2	127.94	26.2	25.0	95.54
Community Sales	1.75	-	-	14.00	16.59	118.50	17.50	20.09	114.80	21.0	24.0	114.48	26.6	28.5	106.93
Bulk Supply (India)	646.0	514.12	79.59	870.0	808.96	92.98	1157.7	673.7	58.19	839.7	609.5	72.59	725.2	565.6	77.99

Appendix 3 (a)
Contribution of each Category in Sales Units

	2005/06		2006/07		2007/08		2008/09		2009/10	
	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %
Domestic	557.94	36.36	617.11	36.37	676.36	37.67	730.83	38.09	110.19	39.21
Non Commercial	78.22	5.09	80.74	4.75	83.01	4.62	91.34	4.76	101.03	4.90
Commercial	90.43	5.89	92.74	5.50	108.12	6.02	107.44	5.60	123.45	5.97
Industrial	96.68	38.89	629.50	37.10	689.80	38.42	763.77	39.81	803.35	38.88
Water Supply & Irrigation	29.28	1.91	29.98	1.76	31.67	1.76	36.12	1.88	42.73	2.06
Street Light	39.52	2.57	45.80	2.70	55.20	3.07	57.84	3.01	64.88	3.14
Temporary Supply	0.28	0.02	0.35	0.02	0.25	0.01	0.39	0.02	0.73	0.03
Transport	5.64	0.36	5.53	0.33	5.47	0.30	5.72	0.30	5.98	0.29
Temple	2.48	0.16	2.81	0.17	4.11	0.23	4.20	0.22	4.91	0.24
Community Sales	5.27	0.37	4.74	0.28	5.58	0.31	8.17	0.42	8.02	0.38
Bulk Supply (India)	133.86	8.72	192.24	11.32	141.24	7.57	112.53	5.87	101.00	4.90
Total	1534.31	100	1696.82	100	1795.23	100	1918.35	100	2066.27	100

Appendix 3 (b)
Contribution of each Category on Sales Revenue

	2005/06		2006/07		2007/08		2008/09		2009/10	
	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %	Actual Sales	Contribution %
Domestic	3641.43	37.59	4249.81	37.82	4578.99	38.18	4987.04	38.70	5363.46	39.09
Non Commercial	722.12	7.45	783.99	6.98	816.01	6.80	862.37	6.69	929.48	6.77
Commercial	818.75	8.45	894.91	7.96	986.07	8.22	1012.66	7.86	1138.21	8.30
Industrial	3608.13	37.24	4039.65	35.95	4380.22	36.52	4799.74	37.25	5061.11	36.88
Water Supply & Irrigation	138.68	1.43	148.53	1.32	154.80	1.29	211.57	1.64	196.63	1.43
Street Light	200.74	2.07	246.79	2.20	329.52	2.75	314.11	2.44	373.06	2.72
Temporary Supply	3.63	0.04	4.74	0.04	3.46	0.03	5.06	0.04	9.86	0.07
Transport	27.90	0.29	29.29	0.26	28.94	0.24	30.72	0.24	30.50	0.22
Temple	12.16	0.13	14.24	0.13	20.80	0.17	29.17	0.23	25.04	0.18
Community Sales	-	-	16.59	0.15	20.09	0.17	24.04	0.18	28.47	0.21
Bulk Supply (India)	514.12	5.31	808.96	7.20	673.69	5.62	609.51	4.73	565.60	4.12
Total	9687.65	100	11237.49	100	11992.61	100	12885.97	100	13721.41	100

Appendix 4
Contribution of each Category in Sales Units

	2005/06		2006/07		2007/08		2008/09		2009/10	
	Actual Consumer	Contribution %	Actual Consumer	Contribution %	Actual Consumer	Contribution %	Actual Consumer	Contribution %	Actual Consumer	Contribution %
Domestic	848540	95.93	930554	95.87	1010719	95.90	1113740	96.02	1229750	96.08
Non Commercial	8629	0.98	9722	1.002	9865	0.94	9950	0.858	10010	0.782
Commercial	3898	0.44	5317	0.55	5454	0.52	6000	0.517	2170	0.482
Industrial	18789	2.12	19833	2.04	21374	2.03	22500	1.940	23020	1.799
Water Supply	251	0.03	305	0.03	352	0.03	370	0.032	380	0.030
Irrigation	1353	0.15	1721	0.177	2557	0.24	3400	0.293	6450	0.504
Street Light	1048	0.12	1229	0.127	1437	0.14	1500	0.129	1550	0.121
Temporary Supply	172	0.019	138	0.014	150	0.014	155	0.013	165	0.013
Transport	49	0.006	48	0.005	48	0.005	50	0.004	54	0.004
Temple	1800	0.203	1738	0.18	1959	0.186	2150	0.185	2290	0.179
Community Sales	1	0.0001	1	0.0001	15	0.0014	35	0.003	58	0.005
Bulk Supply (India)	5	0.0006	5	0.0005	5	0.0005	5	0.0004	5	0.0004
Total	884535	100	970611	100	1053935	100	1159855	100	1279902	100

Appendix 5

Relationship Between Total Revenue & Profit:

Total Revenue is assumed to be independent variable denoted by 'X' and Profit as assumed to be dependent variable denoted by 'Y'.

Fiscal Year	Total Revenue (X) (In Rs '000000')	Profit (Y) (In Rs '000000')	$x = (X - \bar{X})$	$y = (Y - \bar{Y})$	x^2	y^2	xy
2005/06	9687.65	278.9	-2351.35	3678.86	5528856.228	13534010.9	-8650234.82
2006/07	11237.49	-1694.9	-801.512	1705.06	642421.486	2907229.6	-1366626.05
2007/08	11992.61	-3475.2	-46.392	-75.24	2152.218	5661.058	3490.53
2008/09	13264.36	-4808	1225.358	-1408.04	1501502.228	1982576.6	-1725353.08
2009/10	14012.90	-7300.6	1973.898	-3900.64	3896273.314	15214992.4	-7699465.49
	$\sum X = 60195.01$	$\sum Y = -16999.8$	$\sum x = 0$	$\sum y = 0$	$\sum x^2 = 11571205.47$	$\sum y^2 = 33644470.6$	$\sum xy = -19438248.9$

A) Total Revenue (X):

- a. Arithmetic Mean $(\bar{X}) = \frac{\sum X}{n} = \frac{60195.01}{5} = 12039.002$
- b. Standard Deviation $(s_x) = \sqrt{\frac{\sum x^2}{n}} = \sqrt{\frac{11571205.47}{5}} = 1521.263$
- c. Coefficient of Variation $(C.V._x) = \frac{s_x}{\bar{X}} \times 100 = \frac{1521.263}{12039.002} \times 100 = 12.64 \%$

B) Profit (Y):

- a. Arithmetic Mean $(\bar{Y}) = \frac{\sum Y}{n} = \frac{-16999.8}{5} = -3399.96$
- b. Standard Deviation $(S_y) = \sqrt{\frac{\sum y^2}{n}} = \sqrt{\frac{33644470.61}{5}} = 2594.01$
- c. Coefficient of Variation $(C.V._y) = \frac{S_y}{\bar{Y}} \times 100 = \frac{2594.01}{-3399.96} \times 100 = 76.29\%$

C) Coefficient of Correlation (r) Between Total Revenue and Profit (r_{xy}):

We have,

$$\begin{aligned} \text{Coefficient of Correlation } (r_{xy}) &= \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{-19438248.91}{\sqrt{11571205.47} \times \sqrt{33644470.61}} \\ &= \frac{-19438248.91}{3401.65 \times 5800.38} = -0.9852 \end{aligned}$$

D) Coefficient of Determination $(r^2) = (-0.9852)^2 = 0.9706 = 97.06\%$

E) Probable Error of Correlation Coefficient $P.E.(r) = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$
 $= 0.6745 \times \frac{(1-0.9706)}{\sqrt{5}} = 0.0089$

Appendix 6

Relationship Between Total Power Available and Power Loss:

Total Power Available is assumed to be independent variable which is denoted by 'X' and Power Loss is assumed to be dependent variable which is denoted by 'Y'.

Fiscal Year	Total Power Available (X) (In GhW)	Power Loss (Y) (In GhW)	$x = (X - \bar{X})$	$y = (Y - \bar{Y})$	x^2	y^2	xy
2005/06	2066.33	507.42	-360.07	-97.91	129650.40	9586.37	35254.45
2006/07	2261.13	541.97	-165.27	-63.36	27314.17	4014.49	10471.51
2007/08	2380.89	556.79	-45.51	-48.54	2071.16	2356.13	2209.06
2008/09	2642.75	702.15	216.35	96.82	46807.32	9374.11	20947.00
2009/10	2780.92	718.30	354.52	112.97	125684.43	12762.22	40050.12
	$\sum X = 12132.02$	$\sum Y = 3026.63$	$\sum x = 0$	$\sum y = 0$	$\sum x^2 = 331527.48$	$\sum y^2 = 38093.32$	$\sum xy = 108932.14$

A) Total Power Available (X):

a. Arithmetic Mean $(\bar{X}) = \frac{\sum X}{n} = \frac{12132.02}{5} = 2426.40$

b. Standard Deviation $(s_x) = \sqrt{\frac{\sum x^2}{n}} = \sqrt{\frac{331527.48}{5}} = 257.50$

c. Coefficient of Variation $(C.V._x) = \frac{s_x}{\bar{X}} \times 100 = \frac{257.50}{2426.40} \times 100 = 10.61\%$

B) Power Loss (Y):

a. Arithmetic Mean $(\bar{Y}) = \frac{\sum Y}{n} = \frac{3026.63}{5} = 605.33$

b. Standard Deviation $(s_y) = \sqrt{\frac{\sum y^2}{n}} = \sqrt{\frac{38093.22}{5}} = 87.28$

c. Coefficient of Variation $(C.V._y) = \frac{s_y}{\bar{Y}} \times 100 = \frac{87.28}{605.33} \times 100 = 14.42\%$

C) Coefficient of Correlation (r) Between Total Power Available and Power Loss (r_{xy}):

We have,

$$\begin{aligned} \text{Coefficient of Correlation } (r_{xy}) &= \frac{\sum xy}{\sqrt{\sum x^2} \times \sqrt{\sum y^2}} = \frac{108932.14}{\sqrt{331527.48} \times \sqrt{38093.32}} \\ &= 0.9633 \end{aligned}$$

D) Coefficient of Determination $(r^2) = (0.9633)^2 = 0.9279 = 92.79\%$