Chapter - 1

THE RESEARCH DESIGN

Rationale of the Study

Traditionally, commercial banks, working on the Real Bills doctrine, have confined their operations to extending credit to commercial and industrial enterprises. In India also, a review of the genesis and growth of commercial banking reveals that their location pattern, organisational structures, resource/liabilities structure and operational techniques were all geared to meet the working capital needs of large business houses. Over a period of time and especially after the introduction of economic planning in India, there was a change in the composition of credit portfolio of banks. The share of commerce and trade credit declining and that of industrial credit increasing.[1] Subsequently, at the policy level, it was felt that the commercial banking system should be geared to meet the credit needs of other sectors of economy also; rather it was realised that these institutions must be made instrumental for socio-economic transformation.

Accordingly, the Commercial Banks have been assigned a crucial role in the socio-economic transformation of our country. Its functioning, thus, affects the pattern and pace of growth of vital sectors of the economy including the industries. The demand for bank credit has been growing at a fast rate during the last

two decades not only in the commercial and industrial segments of the economy which have been traditionally enjoying it, but also in the hitherto neglected sectors like agriculture, small business and small industry, and different self employment programmes that have been officially assigned a high priority during this period. This continuous increase in demand for the credit, both from traditional and non-traditional sectors and the limited availability of resources with the banking system, brought out in more specific and clear terms, the need for appropriate credit planning and credit monitoring at the level of the banks to ensure maximum credit productivity at the end-use level, which in turn called for a radical change in the system of financing working capital and application of sophisticated techniques of working capital management, especially at the level of the industrial borrowers. Accordingly, a number of Expert Committees and Study Groups examined various alternative approaches towards improving the Bank Lending Systems for meeting the working capital needs of industries and offered various operational models towards better allocation and utilisation of bank credit.

The Reserve Bank of India after examining them, ultimately decided to break the traditional system of bank lending by implementing the major recommendations of the Tandon Study Group in 1974-75.[2] The New System, based on Tandon Study Group Report and further modified on the basis of Chore Committee Report[3] was expected

to improve the working capital management efficiency in industrial sectors especially through efficient inventory control and management by borrower, under an effective monitoring by lending banks.

How far the radical changes brought about by the RBI in the Bank Lending System for working capital needs of industrial borrowers have really been successful in achieving its objective of working capital management is a question which has not been answered so far by any systematic enquiry, although some scholars have tried to look into it, sometimes in a different context.

A Brief Review of Recent Researches

A review of the relevant literature on the subject has revealed that there is no dearth of published material in the field of bank lending or inventory management. Actually there is an enormous amount of research based literature available in different parts of the world, as over the last four/five decades, financial analysts, accountants and management experts have given sufficient thought to these problems and put in enormous effort towards improving the organisation and methods of inventory control and management. On the other hand, much applied research has been done by researchers practically in all countries in the field of bank lending. In India also a number of researches, including some conducted by the National Institute of Bank Management, have highlighted that inventory levels in industries have been unreasonably high and credit limits sanctioned by banks to the industrial borrowers,

under the then prevailing cash credit system, have remained unutilised to the extent of 50 per cent or so. Various other researchers have probed into various aspects of bank credit and inventory management, especially during the last two decades or so.

For example, Dr, Zha (1982) concentrated on Cost-Benefit techniques and tried to estimate the excess cost of inventory.[4] In order to estimate the excess cost, he worked out a minimum required inventory level (MRIL) for nine sample industries and tried to estimate the function of MRIL in which factors like market share of the firm, industry's overall position in the market and technical norms form the principal factors. For giving a dynamic touch to his analysis, he developed the time sequence on the basis of ABC analysis and worked out the cost-benefit component for the same. Though his effort was sincere it was an expost study. Hence, for managerial decisions it has little value. Due to the rapidly changing structure of industries in India, his analysis has hardly any predictive value.

Later on, Kuriappa (1985) tested the applicability of four inventory models to large scale inustries in Tamil Nadu.[5] Using different estimates for required levels of inventory in 15 large scale industries for which 250 units were selected as sample size, he worked out the financial implications of those models as aids to decision making. He concluded that if the sources of inventory finance and inventory requirements are duly dovetailed, the industry

could show better performance financially. While this study offered useful suggestions for inventory control and financial implications, it had several pitfalls. The three aspects considered for selecting the sources of inventory finance were neither exhaustive nor discrete. To some extent they were overlapping. Thus, for policy formulation the study does not provide sufficient and concrete guidelines.

Two other research studies conducted by Jani (1979)[6] and Brahmbhatt (1982)[7] also deserve review. Jani concentrated on testing of inventory models on the sample industries. For the purpose, he used only hypothetical data regarding the variables identified in the models. Likewise, Brahmbhatt also tested the applicability of inventory models on the basis of the statistical information and decision theory. His study involved the specification of variables like stewardship charges and inflationary conditions, creating their impact on the cost of inventory. Both these studies may be useful to industrial units in estimating their inventory requirements. Testing the applicability of any model is rendered useful empirically, if it is based on the hypothetical values of the variables identified in the study. In brief, such a study turned out to be an abstract research bordering heavily upon the area of operations research.

Yet in another study, Bhatia (1985) worked on the inventory levels of road transport in the five major cities of Maharastra state

and found that public road passenger transport suffers from a unique defect in scheduling or replenishing the stock and the use thereof.[8] He estimated the excess inventory on the basis of simple EOQ model. While this study had an empirical bias, transport inventory and industrial inventory do not have common factors to a large extent. The funds required for industrial inventory have different sources and are of different nature and also he did not view organisational pattern as a significant fact, even for the transport sector.

Thus, these researches do not directly answer the question as to what has been the impact of the New Bank Lending System on the inventory management efficiency and inventory levels in industries. To answer this question an attempt is being made in this study to ascertain the changes in the efficiency levels of industrial firms in the area of working capital management. Since, inventory management is the most crucial area involving maximum share of total working capital employed, the study is confined to finding out the impact of New Bank Lending Policy on the inventory management efficiency in terms of the changes in the levels of inventory holdings by the industrial units.

The main objectives of the study are to

1. examine the main features and objectives of the "New Bank Lending Policy and System" relating to the provision of working capital finance to industries and ascertain its impact on :

(i) the Inventory Management efficiency of industrial firms in terms of changes in the levels of industrial inventory;

(ii) Working Capital Management Efficiency of firms in terms of changes in the levels of Gross Working Capital (GWC), Net Working Capital (NWC), Bank Borrowings (BB), Liquidity and Profitability.

2. identify the critical Inventory variables that, affect the levels of Industrial inventory and examine their behaviour in relation to critical environmental factors such as taxation, inflation, risk and return.

3. suggest suitable modifications in the New Bank Lending System and in the prevailing methods of inventory planning and control in industrial firms with a view to ensure greater efficiency in the field.

Hypotheses

With a view to achieve the identified objectives, the following hypotheses have been formulated.

H_1 (a) The level of inventories has significantly come down in the large industrial firms under the New Bank Lending System.

$H_1(b)$ The receivables management efficiency in Indian Industries has improved during the post NBLS period.

H_2 The level of inventories in all the industries is equal to or below the norms prescribed under the NBLS.

H_3 The Working Capital Management Efficiency (WCME) in large industrial units in India has improved during the post NBLS period.

To test this H_3 hypothesis, the following sub-hypotheses have been formulated.

SH_1 For the same level of sales, the Gross Working Capital (GWC) employed has declined during the post NBLS period.

SH_2 The dependence on bank credit to meet the Gross Working Capital needs has declined under the NBLS.

SH_3 The ratio of Net Working Capital to Bank Borrowing has increased under the NBLS.

SH_4 There has not been a significant improvement in the liquidity levels of industril firms.

H_4 The profitability of industrial firms under the NBLS has improved.

H_5 Inflation is an important contributory variable in the growth rate of industrial inventory.

Methodology

In order to test the identified Main and Sub hypotheses, the sample industries have been identified.

The sampling is based on the sampling matrix of the following nature.[9]

$$\begin{bmatrix} S_{11}, & S_{12}, & \cdots\cdots & S_{134} \\ \\ \\ S_{101}, & S_{102} & \cdots\cdots & S_{1034} \end{bmatrix}$$

10 x 34

where,

s = Sample having locational reference of two dimensions which are specified by row and column of the respective sample unit. The row subscript refers to the time

element and the column subscript stands for particular industry.

This is a two-stage stratified random sampling technique. At the first stage, the sample industries are selected and at the second stage, specific units from each industry were drawn. To accord equal chance of getting selected, each industry is re-grouped in the sequential manner on the basis of the shifting weights system, which makes the weights dependent upon the value of the respective unit under the study. The formula for the weights is as under.[10]

$$W = \frac{100}{-I} \quad (I < 0)$$

Where,

W = weight

I = the value of the index to be weighted

For accommodating the significance of variables, composite index is used which is obtained by the following formula.

$$\bar{y}d = \sum_{j=1}^{34} W_j \; Y_{jd}$$

Where,

$\bar{y}d$ = mean value of the specific unit

W_j = weight of the j^{th} unit.

In case of differing coverage of the units, the following formula is used to have a composite index for sequential purpose.

$$I = W_a (a.A) + W_b(b.N)$$

Where,

I = composite index

W_a = the weight of 'a' unit

A = simple index of 'a' unit

W_b = weight of 'b' unit

N = simple index of 'B' unit

It was through the above technique that the following industrial units emerged as sample components.

Group : 1. Chemical Industry

1. Alembic Chemical Works Co. Ltd.
2. Cadila Laboratories Pvt. Ltd.
3. Manish Organic India Ltd.
4. Ambalal Sarabhai Enterprise Ltd.
5. Gujchem Distilleries India Ltd.
6. Cellulose Products India Ltd.
7. Transpek Industries Ltd.

Group : 2. Textile Mills

1. Ahmedabad New Cotton Mills Co. Ltd.
2. Ashoka Mills Ltd.
3. Reliance Industries
4. The Saraspur Mills Ltd.
5. The Arvind Mills Ltd.
6. The Nutan Mills Ltd.
7. The Arun Mills Ltd.
8. The Raipur Mills Ltd.

Group : 3. Steel Industry

1. Neeka Tube Ltd.
2. Gujarat Steel Tube Ltd.
3. Calama Pumps Pvt. Ltd.
4. Unity Steel Ltd.
5. Harsh Engg. Pvt. Ltd.
6. Gujarat Metal Farm Ltd.

Group : 4. Engineering Industry

1. S.L.M. Maneklal Ind. Ltd.
2. Hindustan Brown Boveri Ltd.
3. Jyoti Ltd.
4. Anup Engineering Ltd.
5. Cadmac Machining Co.

Group : 5. Petrochemical and Fertilizer Industry

1. I.P.C.L.
2. G.S.F.C.
3. G.N.F.C.

Group : 6. Automobile Industry (Accessories)

1. Gujarat Automobiles Gear Ltd.
2. Gujarat Narmada Auto Ltd.

Group : 7. Cement Industry

1. Gujarat Ambuja Cement Ltd.
2. Associated Cement Co. Ltd.

It may be observed here all these industrial units are based in Gujarat State. Data from these units and other qualitative information required for analysis and model building have been collected through questionnaires and interview schedules. The data so collected relates to the years 1983 to 1988. The conceptual frame of each technical term used in the process of collection and analysis of data has been defined and specified in terms of components. A uniform concept has been used throughout the Study with a view to ensure the analytical comparability. In order to ensure the reliability, the data published in the financial statements of the concerned industrial units have also been cross checked with the data responded in the questionnaires and inconsistency

found have been reconciled after discussion with the concerned executives.

The primary data so called have been analysed through various statistical techniques and the models developed have also been fed with the same data for testing the hypothesis.

As the primary data collected in respect of 34 identified industrial units, located in Gujarat, could give a regional situation and suffer from regional peculiarities, it was thought appropriate to analyse all India data also. For the purpose of all India analysis, the industrial units financed by I.C.I.C.I. itself has been used. In order to arrive at the final conclusion, the findings based on the I.C.I.C.I. data and the primary data collected from Gujarat, have been compared.

In order to test the hypothesis relating to the performance efficiency of industrial firms, certain important ratios have been used. This ratio analysis provided an insight into the changes in the working capital management efficiency along with the changes in the inventory levels. Analysis relating to the changes in the profitability of the firms, was also carried out to understand, if there was any uniformity in the direction of changes in the size of working capital, inventory levels, bank borrowings and profitability.

Further to make a final investigation into inventory management

by these firms and analytical inventory model, involving the trend analysis, risk and return consideration and relation of incremental inventory to working capital, work in progress, finished goods and bank borrowings, has been developed and tested. Also the findings based on the analytical inventory model have been explained in terms of 'Inflation'. On the basis of qualitative information and the opinion survey, an effort has been made to specifically identify the critical factors, internal as well as external, that influence the inventory levels of industry.

At the end, in order to find out the impact of bank lending on inventory finance, a statistical model based on the relevant and critical parameters has been developed and used. The model considers the incremental changes and component variables, therefore, have been quantified in the index form as defined below.[11]

$$I_{it} = a\frac{x_{i1} - \bar{x}}{\delta x_1} + b\frac{x_{i2} - \bar{x}}{\delta x_2} + c\frac{x_{i3} - \bar{x}}{\delta x_3} + k\frac{x_{i4} - \bar{x}}{\delta x_4}$$

$$\text{i.e., } \sum T_{it} = \sum_{i=1}^{n} \cdot \sum_{i=1}^{m} \left(\frac{x_{it} - \bar{x}_i}{x_i} \right)$$

Further to overcome the problem of serial co-relation in the analysis, co-efficients have been estimated for aggregative as well as sample data. For each variable a cut-off point has been worked out with the held of discreminent function specified below.[12]

$$Zi = a\,Xi + b\,Yi$$

where,

Zi = Particular independent variable

Xi = The time deviation i.e. column wise mean deviation of that variable

Yi = Position wise mean deviation i.e. raw wise mean deviation.

Further to minimise the possibility of mis-classification variance form has been used by applying the following equations.[13]

$$a.\ \sigma^2 x + b.\ \sigma xy = dx$$

$$a.\ \sigma^2 xy + b.\ \sigma^2 y = dy$$

Solving this two nominal equations

$$a = \frac{\sigma^2 xdX - \sigma xydY}{\sigma^2 x.\ \sigma^2 y - \sigma xy.\ \sigma xy}$$

$$b = \frac{\sigma^2 y \cdot dY - \sigma xy \cdot dX}{\sigma^2_x \cdot \sigma^2 y - \sigma xy \cdot \sigma xy}$$

Where,

$\sigma^2 x$ = Variance of x

σxy = Co-variance of x and y

$\sigma^2 y$ = Variance of y

dx = difference between mean values of x for the two groups

dY = difference between the mean values of Y for the two groups.

Limitations of the Study

This study is based on national level and state level samples. Hence, it is likely that there may be some deviations if some other method of sampling is adopted. Secondly, though with some allowances made for qualitative aspects at the relevant points, the study suffers from the presence of error term and inadequate weightage to the qualitative aspects. Thirdly, the study does not cover the inter-regional differences as it was difficult due to time and cost constraints. Fourthly, the study covers the principal factors in the analysis of pooling of time series and cross section. Such an approach cannot claim universality. Fifthly, time gap in the circular flow of goods and money in

the respective industries and banks has not been accomodated in the study. Hence, it lacks a dynamic version to that extent. Sixthly, various types of bank credit viz., cash credit, O.D., Loan etc., have different impacts on the borrowing units as well as on the overall economy of the country. The study has not analysed this aspect in detail.

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