CHAPTER 2

METHODOLOGY

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2.1 *Introduction*

This chapter contains the methodology adopted for collection and analysis of the data for the study. The scope of the study, sources of the data, procedure followed for selection of the sample, the population size, classification of the sample and various concepts are elaborated in the following paragraphs. The chapter also discusses the techniques used for determining the composite liquidity of a firm, the analysis and interpretations of liquidity of the total sample as well as the variables. The hypotheses to be tested have also been discussed in this chapter.

2.2 *Scope of the Study*

The present study aims at analysing liquidity in corporate sector of Eastern India. The nature, degree and magnitude of resource constraints are more in production enterprises due to a long operating cycle blocking a sizable amount of funds. The service sector have more flexibility with regard to resources of funds by virtue of their nature of operations. As compared to public sector enterprises the private sector enterprises face difficulties in encountering liquidity problems. It is in this context that the scope of the study is confined to the non-financial and non-government public limited companies registered and having their head office in Eastern India. The study also intends to analyse commercial, accounting and theoretical liquidity only.

The scope of liquidity is very wide and broad based. For theoretical understanding, the first part of the study is confined to the socioeconomic backdrop of Eastern India, the review of literature of various aspects of liquidity and corporate growth in India. For the analytical and technical study, the second

part is relevant. Part two deals with the evaluation of liquidity parameters, determination of composite liquidity of a firm, analysis of overall trend and pattern of liquidity of the total sample companies. It also contains the variable-wise analysis of liquidity and the impact of each such variable on the overall trend and pattern of liquidity of the total sample companies.

The period of the study is limited to ten years (one decade) commencing from 1987-88 and ending on 1996-97. This period includes last three years of seventh five year plan (1988-90), two annual plans (1990-91and 1991-92) and eighth five year plan (1992-97). We have selected the year 1987-88 as the beginning of the study period and have taken the year 1996-97 as the concluding year of our study period. Further, the year 1987-88 was treated as a normal year for the major economic activities and is adopted as the base year for analysing the trends in the liquidity of our sample companies. We have taken the year 1996-97 as the concluding year of our study period, because by the time we start collecting data, it is anticipated that data up to 1996-97 will be available in the Stock Exchange Official Directory, Mumbai. Normally The Stock Exchange Mumbai takes about one year to process the Annual reports and accounts after submission by the listed companies and present them uniformly in its Official Directory. In view of the non-availability of upto date data from the private limited companies and the Government companies, the study was confined only to the listed public limited companies in the private sector having their registered office in any one of the four major states, viz., Assam, Bihar, Orissa and West Bengal of Eastern India. The study will cover only the non-financial and non-government public limited companies in the private sector and analyse the theoretical liquidity of these companies as the true liquidity can be ascertained only after a company is liquidated. Further the period of ten years can be justified in view of liberalisation, globalisation and economic reforms by the Govt. of India from 1991-92. On this ground the entire period of study can be grouped into two equitable parts, the first five years (1987-92) forming the pre-liberalisation period and the next five years (1992-97), the post liberalisation period for objective analysis.

2.3 *Sources of the Data*

The data desired for the purpose of the study are of the following nature :

(a) Information relating to growth of corporate sector in India during pre-independence and post-independence plan periods.

(b) Information relating to growth of public limited companies in private sector.

(c) Information relating to growth of joint stock companies in India distributed in different regions.

(d) Information relating to distribution of companies in India by industrial activities.

(e) Information relating to the nature of industrial activities, size and age of the sample companies.

(f) Annual published financial statements of sample companies from 1987-88 to 1996-97.

The data for the above purpose is collected from secondary sources of information. The data relating to the growth and distribution of companies at work has been collected from company News and Notes, a journal of the Department of Company Affairs, Annual Reports, Department of Company Affairs, various Annual reports on the Working and Administration of the Companies Act, 1956, Department of Company Affairs, Books and periodicals , RBI bulletins and Government reports. But the informations relating to the nature of industrial activities, size and age of the sample companies as well as their annual financial statements have been collected from the Stock Exchange Official Directory, Mumbai. The additional information has been collected from the various issues of Reserve Bank of India (RBI) monthly bulletins, Economic and Political Weekly, etc.

2.4 *Selection of the Sample*

Keeping in view the scope of the study, it was decided to include all the non-financial public limited companies in the private sector which are registered

and working in the states of Assam, Bihar, Orissa and West Bengal during 1987-88 to 1996-97 and have listed themselves in any of the Stock Exchanges in India. As on 31st March, 1987, the beginning of the study period there were 2830 such companies in the whole of Eastern region of which 2718 were only in Assam, Bihar, Orissa & West Bengal. As on the same date, there were 12560 non-Government public limited companies registered and working in India out of which 3515 were listed in stock exchanges of India. This constituted about 28 percent of the total public limited companies in the private sector. Out of the listed companies 501 were found to be working in the Eastern region having their registered office in the same region. Thus, these 501 companies formed the universe for our study.

On further scrutiny of these companies, the list had to be shortened because complete data for the entire period of study could not be procured due to non-submission of statements or non-working of a company in a particular year, etc. Further, companies liquidated during the period of study are excluded from the sample list.

Only 80 companies were found to be existing in the official directory having continuous and uniform data throughout the period of study out of the total listed companies of Eastern region. As such the sample constituted about 16 percent of total sample companies listed in the stock exchanges and more than 3.5 percent of the total companies at work in the Eastern region as on 31st March '87. These sample companies with a paid up capital of Rs. 736 crores as on 31st March '87 accounted for 43 percent of the total paid up capital of non-Govt. public limited companies at work on 31st March '87 in the whole of Eastern region and 12% of the paid up capital of the total non-government public limited companies at work in India at that time. Hence, the sample can be taken as representative of the entire organised private corporate sector in Eastern India in term of number of companies as well as paid up capital.

2.5 *Classification of the Sample*

It is necessary to classify the companies into different groups because the trends and patterns of liquidity is expected differ from one group to another. Further, the classification of the total sample companies into different groups can give an overall idea on the coverage of the sample. The sample companies therefore, have been classified into different groups on the basis of industrial activities, size and age of the companies for the purpose of group-wise (variable-wise) analysis.

2.5.1 *Industry-Wise Classification*

In the literature of financial statement analysis it is assumed that an industry is a set of products which are "reasonably homogeneous with respect to end product". Our classification of sample companies into different industry groups is as per the information about the end product given in the Stock Exchange Official Directory, Mumbai. Accordingly, the sample companies have been classified into 15 major industry groups. The number of companies included in the different industry groups and the relative importance of the different industry groups in terms of Gross Total Assets as on 31.3.97 are depicted in Table 2.1.

Companies belonging to tea plantations, metals and metal products, and general engineering form an important constituent of the sample which respectively constitute about 21.25, 18.75 and 12.5 percent of the total sample companies. Though the miscellaneous group companies constitute about 8.75 percent of sample, this has not been considered as an important constituent of the sample because it is a heterogeneous group with respect to end products. Companies belonging to paints, rubber, wood products, hotels, diversified industries, etc. have been included under the miscellaneous group of industries.

TABLE 2.1

INDUSTRY GROUP-WISE CLASSIFICATION OF SAMPLE COMPANIES

Sl. No.	Industry Groups	Number of Companies	Gross Block Assets	
			Rs. Lakh	%
1.	Aluminium	02	21805	4.64
2.	Cement	03	18655	3.96
3.	Chemicals	04	54625	11.64
4.	Cotton Textiles	02	1007	0.20
5.	E. E. Equipments	03	21159	4.50
6.	Food	02	4162	0.89
7.	General Engineering	10	15293	3.25
8.	Jute	04	40669	8.66
9.	Metals & Metal Products	15	95505	20.35
10.	Paper & Paper Products	02	41540	8.84
11.	Refractories	03	10951	2.33
12.	Sugar	03	4605	0.96
13.	Synthetics	03	19694	4.20
14.	Tea Plantations	17	48338	10.31
15.	Miscellaneous	07	70800	15.31
	Total	80	468758	100.00

Source : Stock Exchange Official Directory, Mumbai

2.5.2 *Classification by Size*

The sample companies have been classified into four size-groups based on their paid up capital as on 31.3.87. These groups are small, medium, large and giant, the details of which are presented in table 2.2.

Companies having paid-up capital below Rs. 1 crore are classified as small companies. They constitute 8.75 percent of the sample. The companies

categorised as medium companies have the paid up capital between Rs. 1 crore and Rs. 5 crore, which account for 21.25 percent of the sample companies. The companies in the large size group, each with paid up capital between Rs. 5 crore and Rs. 25 crore, and constitute 48.75 percent of the sample. The companies each having a paid up capital of Rs. 25 crore and above are categorised as giant companies and account for 21.25 percent of the sample companies.

Both medium and large size groups/ both large and giant size groups together constitute 70 percent of the total sample. Thus medium, large and giant size groups together constitute more than 90 percent of the sample.

TABLE -2.2

CLASSIFICATION OF SAMPLE COMPANIES BY SIZE

OF AVERAGE PAID UP CAPITAL

Size Groups	Average paid-up capital Of Individual Companies	Number of Companies
Small	Below Rs. 1 Crore	07 (8.75)
Medium	Rs. 1 Crore to Rs. 5 Crore	17 (21.25)
Large	Rs. 5 Crore to Rs. 25 Crore	39 (48.75)
Giant	Rs. 25 Crore and above	17 (21.25)
Total		80 (100)

Note: Figures in bracket indicate percentages

2.5.3 *Classification By Age*

The sample companies have been classified into four age-groups : new, moderately old, old and very old. For determining the age of individual companies, their date of incorporation is taken into consideration. The companies incorporated after 1970 are classified as new companies. The companies registered after 1945 but before 1971 are classified as moderately old companies. The companies registered after 1920 but before 1946 are regarded as old companies and the

companies incorporated prior to 1921 are considered as very old companies. The number of companies included in different age-groups and the relative importance of the different age-groups are depicted in Table 2.3

TABLE 2.3

CLASSIFICATION OF SAMPLE COMPANIES BY AGE-GROUPS

Age Group	Year of incorporation	Number of companies	
New	After 1970	22	(27.5)
Moderately Old	1946 to 1970	28	(35)
Old	1921 to 1945	18	(22.5)
Very Old	Prior to 1921	12	(15)
Total		80	(100)

Note: Figures in bracket indicate percentages

The moderately old companies in the highest age groups and the very old companies in the lowest age-groups constitute 35 percent and 15 percent respectively of the total sample companies whereas the new and old companies comprise 27.5 and 22.5 percent respectively.

2.6 *Concepts*

The various concepts used in this study are briefly described as follows:

(a) ***Current Assets***

All circulating and floating assets or assets which are all in move are called current assets. It includes inventory , debtors, accounts/ bills receivable, cash and bank balances and other current assets including investments in marketable securities.

(b) ***Quick/Liquid Asset***

It Includes all current assets except inventories/stock.

(c) ***Absolute Liquid Assets***

It includes all quick/liquid assets except debtors.

(d) ***Current Liabilities***

All liabilities which are to be discharged in a short period of time (say one year) are included in this head.

(e) ***Net Sales***

Net sales taken in this study has been derived by deducting sales return, allowances and discount from the gross amount received or receivable from sales.

(f) ***Cost of Goods Sold***

The cost of goods sold in the present study has been calculated by adding inventory at the beginning, purchases, direct wages and other manufacturing expenses excluding depreciation and deducting inventory at the closing.

(g) ***General Expenses***

General expenses include expenditure other than on goods and their production that is, the sum of office and administration expenses, selling and distribution expenses and other indirect expenses.

(h) ***Cash Flow From Operation (CFO)***

CFO has been taken as the excess of net sales over stock consumed, wages and salaries, manufacturing expenses excluding depreciation, and general expenses.

(i) ***Earning Before Interest and Tax (EBIT)***

EBIT has been arrived at by adding or subtracting the non-operating surplus/ deficit, as the case may be, to/from net sales and then by deducting cost of goods sold, depreciation and general excpenses.

(j) ***Earnings Before Depreciation, Interest and Tax (EBDIT)***

The sum of EBIT and depreciation provided for during the year has been treated as EBDIT. It is otherwise called as gross earnings.

(k) ***Gross Total Assets (GTA)***

Gross total assets have been taken as the aggregate of total assets as reported in the balance sheet and accumulated depreciation appearing as deduction from the fixed assets in the balance sheet.

(l) ***Total Tangible Assets (TTA)***

The excess of total assets over intangible assets less depreciation on fixed assets has been taken as total tangible assets.

(m) ***Capital Employed (CE)***

The term capital employed has been taken as the aggregate of the long term loans, debentures, short term loans and advances and the shareholders equity.

(n) ***Total Debts (TD)***

The term total debt has been taken as outside debts that is, long term loans, bonds, debentures, short term loans and advances.

(o) ***Working Capital***

It is the excess of current assets over current liabilities. It is also known as net working capital.

(p) ***Gross Working Capital***

It is total of all current assets.

2.7 *Techniques of Analysis*

In the present study , an effort has been made to analyse the Liquidity in the corporate sector of Eastern India with the help of following accounting and statistical tools.

2.7.1 *Ratio Analysis*

Accounting ratios constitute the most important tool for analysing corporate liquidity. As many as 17 liquidity ratios and other related ratios have been used for total sample analysis as well as variable wise analysis and analysis of composite liquidity. The ratios are namely,

(a) Current Ratio (CR)

(b) Liquid Ratio (LR)

(c) Absolute Liquid Ratio (ALR)

(d) Debtors Turnover Ratio (DTR)

(e) Inventory Turnover Ratio (ITR)

(f) Cash Turnover Ratio (CTR)

(g) Working Capital Turnover Ratio (WCTR)

(h) Net Working Capital to Total Tangible Assets (WCTTA)

(i) Internal Measures in Days (IM)

(j) Debtors to Current Asset (DCA)

(k) Inventory to Current Asset (ICA)

(l) Cash & Bank to Current Asset (CBCA)

(m) Misc-Current Asset to Total Current Asset (MACA)

(n) Gross Surplus Ratio (GSR), i.e., Earning Before Depreciation, Interest and Tax to Gross Total Assets (EBDIT to GTA)

(o) Cash Flow From Operation to Sales (CFOS)

(p) Cash Flow From Operation to Capital Employed (CFOCE)

(q) Cash Flow From Operation to Total Debts. (CFOTD)

The ratios are expressed either in percentage or in number of times or in days. For analysing the overall liquidity by a single ratio, we have used Liquid ratio where ever necessary in our study. The reason for adopting this ratio as an unbiased measure of overall liquidity is justified in the subsequent chapter. A brief description about these ratios have been made in chapter 5 and 6 as and where applied.

2.7.2 ***Mean and Coefficient of Variation (CV)*** : We have also applied and calculated ten-yearly average (mean) and coefficient of variation of all liquidity ratios for sake of better and effective analysis.

2.7.3 ***Correlation Analysis*** : Coefficient of correlation is used to find out the existence of any relationship between the liquidity variables used in the study. To study the degree of relationship between different liquidity parameters, we have computed the product moment coefficient of correlation which helped in short listing the large number of liquidity ratios and to study the composite

liquidity with the help of a least number of ratios.

2.7.4 ***Annual Growth Rates (AGR)*** : To study the growth of corporate sector in terms of number as well as paid-up capital we have computed the compounded annual growth rate (CAGR). But to study the general trend of different liquidity ratios, and overall liquidity in corporate sector we have calculated the constant annual growth rates (AGR) under ordinary least square (OLS) approach.

2.7.5 ***Runs Test*** : Runs test has been used to examine if the signs of successive changes in liquidity ratio are independent, i.e., to test whether the liquidity series follows a systematic pattern or not.

2.7.6 ***Simple Regression Analysis*** : In order to study whether the corporate sector's mean liquidity ratios can be perceived as the target ratio by the industries, the technique of simple regression analysis has been used. Further, to study the extent to which industry factors affect an individual firm's liquidity, the technique of simple regression analysis has been used.

2.7.7 ***Other Statistical Techniques*** : Lastly, a number of tests of significance, viz., t,z,F, Chi-square tests, ANOVA, etc, have been applied to test our hypothesis as and where applicable.

2.8 *Hypotheses of the Study*

The study broadly aims at examining the following hypotheses with the available data and techniques. However, the testing of hypotheses is confined only to the Eastern region. The hypotheses are :

(a) The measure of general liquidity remains constant over the years.
(b) The nature of the business, size and age of a firm have a great bearing on its liquidity.
(c) The corporate sector's mean liquidity ratios are perceived as the target ratios by the industries.
(d) A firms liquidity could be well described as a random-walk model.
(e) The industry-wide factors are important factors affecting an individual firm's liquidity.
(f) There is always a negative relationship between liquidity and profitability.
(g) Liberalisation policy adopted by the Government has no effect on the Liquidity management of a firm.