

## WORKING CAPITAL MANAGEMENT PRACTICED IN PHARMACEUTICAL COMPANIES LISTED IN DHAKA STOCK EXCHANGE

Anup Chowdhury  
BRAC Business School  
BRAC University, 66 Mohakhali  
Dhaka-1212, Bangladesh

and

Md. Muntasir Amin  
Department of Finance  
University of Dhaka

### ABSTRACT

Among all the problems of financial management, the problems of working capital management have probably been recognized as the most crucial one. It is because of the fact that working capital always helps a business concern to gain vitality and life strength. The objective of this study is to critically evaluate working capital management as practiced in the selected firms of the Pharmaceutical industry. To achieve this goal the study also examines the policy and practices of cash management, evaluate the principles, procedures and techniques of inventory management, receivable management and payable management. But the study does not examine the political and economic impacts on the working capital management. From the analysis we can conclude that pharmaceutical firms operated in Bangladesh are efficiently deal with their liquidity preferences and investment criteria and this is due to the competitive nature of this industry.

**Key words:** Working capital management, Liquidity, Efficiency, Investment criteria, Credit worthiness.

### I. INTRODUCTION

Working capital management refers to all management decisions and actions that ordinarily influence the size and effectiveness of the working capital. It is concerned with the most effective choice of working capital sources and the determination of the appropriate levels of the current assets and their use. It focuses attention to the managing of the current assets, current liability and their relationships that exist between them. In other words, working capital management may be defined as the management of a firm's liquid assets viz-cash, marketable securities, accounts receivable and inventories.

In the present day context of rising capital cost and scarce funds, the importance of working capital needs special emphasis. It has been widely accepted that the profitability of a business concern likely depends upon the manner in which its working capital is managed. The inefficient

management of working capital not only reduces profitability but ultimately may also lead a concern to financial crisis. On the other hand, proper management of working capital leads to a material savings and ensures financial returns at the optimum level even on the minimum level of capital employed. We also know that both excessive and inadequate working capital is harmful for a firm. Excessive working capital leads to un-remunerative use of scarce funds.

On the other hand inadequate working capital usually interrupts the normal operations of a business and impairs profitability. There are many instances of business failure for inadequate working capital. Further, working capital has to play a vital role to keep pace with the scientific and technological developments that are taking place in the concerned area of pharmaceutical industry. If new ideas, methods and techniques are not injected or brought into practice for want of working capital, the concern will certainly not be able to

face competition and survive. In this context, working capital management has a special relevance and a thorough investigation regarding working capital practice in the pharmaceutical industry is of utmost importance. An attempt has, therefore, been made to undertake an in-depth study on, working capital practices by Bangladeshi firms in pharmaceutical industry enlisted in DSE.

## II. LITERATURE REVIEW

While designing the survey questionnaire the following articles published in international Journals, were reviewed. This paper is presented on the basis of four major dimensions of Working Capital.

A survey conducted by Gitman, Moses, and White reveals that Lockboxes were widely used to accelerate the collection process. Virtually all-large firms use lockbox systems as do a large percentage of smaller firms. This somewhat lower use by smaller firms is a reflection of the costs versus the gains from lockbox systems. The survey farther reveals that to bring collected funds together for use, over one-half of all large firms use concentration banking, with wire transfers and depository transfer checks being the primary means of moving funds from one bank to another. The survey was also extended to management of disbursement. The survey says the primary tools for the management of cash outflows are zero-balance accounts and centrally controlled disbursing. Central control of disbursements is the major tool for about 70 percent of large firms. The vast majority of larger firms use zero-balance accounts, although smaller firms use them less frequently. [see Gitman, *Managerial Financial Management*, 8<sup>th</sup> Edition, Thomson, 1998, pp. 350-390]

Another survey by R. Kamath, S. Khaksari, H. Meier, and J. Winklepleck reveals that almost all-large firms invest surplus cash in money market instruments. The most popular investment is commercial paper, certificates of deposit, repurchase agreements, treasury securities, and banker's acceptances. [see Kamath R., S. Khaksari, H. Meier, and J. Winklepleck, "Management of Excess Cash: Practices and Development," *Financial Management* (Autumn 1985), pp. 70-77]

Another finding of Gitman & others survey was that almost all-large firms prepare cash forecast.

Similar finding can also be obtained from Rappaport and others survey (1984, pp.45-64). In particular the survey indicates that a substantial number of firms keep a stock of short-term investments for precautionary reasons. Another conclusion of the report was that many firms also borrow to address unanticipated cash needs, either directly from banks or through the commercial paper market. The survey also indicates that in general, quantitative and statistical models are in wide use in working capital management. The models are in use by less than 10 percent against of large firms. Further, smaller firms do not use them all. [see Lawrence Gitman, D. Keith Forrester, and John R. Forrester, "Maximizing Cash Disbursement Float," *Financial Management* (summer 1976), p 15-24.]

A questionnaire survey by Smith and Sell [see "Working Capital Management in Practices" published in 1978] indicate that 68% of the respondent firm used either cost balancing models or computerized inventory control. The survey evidence reports that the basic models of inventory management are widely used.

A survey by Besley and Osteryoung reveals that the vast majority of the firm sell output via trade credit, 87% of the manufacturing firms reported that 91 to 100 percentages of their sales are made on a credit basis. [see Besley and Osteryoung, "Account Receivable Management," pp. 79-95]

The Survey by Hill, Wood & Sorenson indicates that a firm once set, rarely consider changes in its terms of sale. They also found that when competitors change terms, other sellers typically will "follow the leader". [see N. Hill, "A Generalized Cash Flow Approach to Short-term Financial Decision," *Journal of Finance*, Vol.38, No. 2 (May 1983), pp. 349-60]

Another survey by Scherr reveals that firms use the traditional '5 C's of Credit' to make judgmental decisions on credit applicants, though a substantial fraction use some type of credit -scoring approach. However, there is also survey evidence that firms can and do make reasonably accurate estimates of default probability, delinquency, and discount rates. [see F. Scherr, "Estimating and Using Failure-Forecasting Functions: Some Problems and Some Proposed Solution," *Baylor Business Studies* (January 1982), pp.16]

Published survey results from the mid-1970s showed aging fractions to be the most popular method of monitoring customer payment patterns at the time [see Smith and Sell, "*Working Capital Management in Practice*," pp.55 and 69]

In 1983 N. Hill, W. Sartoris and D. Ferguson conducted a survey of the accounts payable managers of 1,479 firms of various sizes in various industries: 180 responses were received. A major thrust of this survey was obtaining information on firm's decision regarding two methods of obtaining finance from accounts payable; skipping the discount and stretching accounts payable. The survey revealed that the vast majority of firms generally take the discount. In deciding whether to take the discount, the primary criterion of most firms is the amount of the discount. This makes good financial sense, since the amount of discount (along with the delay period from the discount date to the due date) determines the cost of skipping as a source of financing. [See N. Hill, W. Sartoris, and D. Ferguson, "Corporate Credit and Payable Policy: A Survey Size and Industry Effects," paper presented at the Financial Management Association's 1983 Annual Meeting]

The other financing strategy in connection with accounts payable is the stretching of payables beyond the due date. Hill, Sartoris and Ferguson's survey revealed three important factors that are considered by firms in deciding whether to use this strategy; the value of using the funds (that is the cost of the funds relative to other funding sources), the effects on relationships with supplies and the impact on the firms credit rating.

Another survey by Farragher on 33 firms revealed that most of the firm uses the traditional form of financing. The researchers had also found that there is a growing interest among the firm in using Factoring as an alternative means of financing. [See E. Farragher, "Factoring Account Receivable," *Journal of Cash Management* (March/April 1986), Page 39]

### III. METHODOLOGY OF THE STUDY

For in-depth analysis of working capital management this paper has used both primary and secondary informations. Primary data has been collected through questionnaire survey with a object to know the real practices of working capital management in pharmaceutical industries of

Bangladesh and secondary time series data has been taken to see the link between financial and production performance with working capital management. And for that published annual reports from 2000 to 2005 are considered.

#### ***The Sample Surveyed:***

The focus of this survey was to assess Working Capital Practices in Pharmaceutical Industry. For this purpose concentration has given only on the firms that are listed in the Dhaka Stock Exchanges (DSE). And the paper is used stratified random sampling to select eight out of the twenty-five firms listed in the DSE. The selection of firm was also constrained by the factor such as its enlistment year in DSE. For the sake of a wider data set we have concentrated on the firms that have been listed in DSE after 1990. To avoid misclassification of firms we have concentrated only on the pharmaceutical firms and chemical firms were discarded since the inception of study. Qualitative informations were collected on the basis of a questionnaire in a face-to-face interview with the appropriate person of the firms. The questionnaire was divided into four parts in accordance with the four major dimensions of the Working Capital management: Management of Cash, Inventory Management, management of Accruals and Payables, Management of Accounts Receivables. The questionnaire had 32 questions, which are open and close end in nature. In the questionnaire, the respondents were encouraged to write comments on different aspects. Many narrative comments made on the questionnaire provided us with valuable insights regarding the survey intention.

#### ***Econometric Modeling:***

In the Econometric Modeling Part, different econometric tools were used. Multiple Regression Models were framed based on Cross Sectional Pooled data from the annual report to assess the impact of working capital policy on the industry's Profitability criteria. These models will be discussed in the later part of our study.

#### ***Two Group Discriminant Analyses:***

The Discriminant Analysis, as a Statistical Tool, can be used to classify the observation into two distinct group based on some pre-designed variables. It exploits the differences in the

distributions of the two groups of observations. The Discriminating Function in this case will be:

$$Y = \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + \alpha_4 X_4 + \dots + \alpha_n X_n$$

Where,

Y = Dependent Variable.

X = Independent Variable

$\alpha_i$  = Discriminant Coefficient.

The Assumptions of Discriminant Analysis are:

- The fundamental assumption in Multivariate Analysis is the normality of the data.
- It was assumed that the data set a linear.
- There is no Multicollinearity in the data series.

#### **Sample Size**

For discriminant analysis we have collected the data of the previously mentioned eight firms for a period of 2000 to 2003. Ratios of these firms are used for the computation purpose.

#### **IV. WORKING CAPITAL PRACTICE**

This Section in fact, deals with the theoretical aspects of different Working Capital Policy and their Practical Implication for Bangladeshi Firms. As usual, we have gone through four main dimensions of Working Capital Management: Cash Management, Management of Accounts Receivables, Management of Inventory and Management of Accounts Payables.

##### **Cash Management**

The most important of all the liquidity responsibilities of the financial manager is the managing of cash, both flows and balances. Cash is the benchmark of liquidity. This underscores the fact that the most important test of a financial manager is to maintain an adequate reserve of cash for all times so as to absorb the shocks of sporadic receipts and payments and meet the needs of emergency situation, otherwise paucity of cash even on a temporary phase may be cause a trouble. Our survey result indicates that almost all of the companies manage liquidity to provide a smooth production process and to reduce the cost of inefficient management. Another important result the survey is that 60% of the companies have determined optimum level of liquidity and 40% do

not have any optimum level. One of the imperative aspects of Cash Management is Cash Collection Mechanism. Float is considered to be one of the important aspects of Collection Mechanism. Our survey result says that most of the companies that sales goods on credit collect cash through marketing agent that means the Billing & Mail float for these firms are zero. The Bank Processing Float for these firms is on an average less than 2 days.

*Concentration banking:* It refers to a system of centralizing corporate cash with a goal of controlling the movement of funds and minimizing idle cash balances. The survey results get that for reducing collection float of check 60% of companies use the Banks with accelerated clearing capabilities where 30% use Intra-Banks Electronic fund transfer. 5% of companies also use oral procedure.

*Cash Forecasts:* A firm should forecast cash to anticipate cash surplus and shortage, estimate timing of borrowing and lending of funds and have better control over funds. In survey it has been found that 80% of these firms prepare Cash Forecasting Statements. The remaining 20% of the firms follow Budgetary Method for controlling of cash. Of the 80% firms, 60% of them prepare cash forecasting Statement on Yearly Basis. 20% of the firms prepare cash forecasting statement on half yearly basis and the remaining 20% of the firms prepare cash forecasting statement on monthly yearly basis

*Hedging Strategies:* Hedging is important to protect the uncertainty associated with obtaining cash balances in time. One common strategy for hedging is funding the firm's expected financing needs by the establishment of a reserve credit line with a bank or group of banks. In the survey result it has been pointed out that 60% of the companies yet to face liquidity crisis. Almost all of these firms hedge their position by maintaining credit line with the Bank.

*Models of Cash Management:* There are different models that address the issue like proper management of temporary cash surplus and shortage. These models provide optimum strategies for a given time pattern of future cash flows. These Models are the Baumol Mode, the Beranek Model, the Miller-Orr Model, and the Stone Model. The survey result indicates that 80% of the firms do not

experiences surplus fund, the remaining 20% firms invest excess fund for short period. Another result of the survey indicates that 90% of the companies experienced continuous cash flow. That means for these firms Miller-Orr Model or Stone Model can be applied. In few cases, firm experience periodic cash outflow and continuous cash inflow. For these firms Beranek Model can be applied.

***Receivable Management:***

Receivables occupy the second place, in order of investment, among the various components of working capital in manufacturing concerns. The manipulation of receivables is to push up sales and ultimately profits by allowing certain credit to the potential customers who otherwise may find it difficult to make cash purchases. Moreover, receivables are being near cash item improved the liquidity position of an enterprise. The financial significance of credit transaction is evidenced by statistics reporting that 20 to 25 percent of the typical manufacturer's total asset is receivables. As we know, the emergence of receivables in business operation creates revenue and cost. Hence, the volume, composition and movements of receivables are required to be so designed and maintained that these ultimately help maximization of the value of a firm which is the long standing and accepted principle of financial management.

*Credit Granting Decision:* One of the major aspects of Accounts Receivables is Credit Granting Decision. If the firm fails to identify the appropriate customers, it faces severe problem to sustain in the long run. There are different approaches to Credit Granting Decisions. The traditional method is 5 C's (Capital, Character, Collateral, Capacity and Condition), which is very popular method for quick credit granting measuring creditworthiness of applicant. An alternative to this traditional approach is Judgmental Scoring approach. There are two basic versions of these systems. One is Checklist System and the other one is Weighted Scoring System. Survey results indicated that most of the companies (60%) don't sell on credit. Of the remaining 40% of the firms, 50% of them follow traditional 5'C method and the others don't consider any method for granting credit.

*Terms of Sale decision:* A firm should determine the appropriate terms of sale based on the buyer's

financial conditions and firms expected cash flow. It has been revealed from the survey result that on an average the net period in terms of sales is less than 30 days in case of 75% firms covered under survey and between 30 to 60 days in case of 25% firms. It is also found that 50% of the companies use differential terms of sales and remaining use a uniform policy. 60% of the firms frequently change terms of sales where as 40% rarely change. If there is any margin then most of the credit sales used companies change terms of sales for taking a competitive position.

*Factoring:* In advanced countries Factoring is gaining more and more popularity. In factoring the firm sells its' receivable asset to the financial intermediary (the factor) and obtain financing. From the survey result we see that none of these firms use factoring as a means of financing. Some company has used it when there is contract base work.

*Default in Accounts Receivable:* The important policy implication from firm's point of view is that when the buyer defaults, future cash flows to the seller are delayed, and their amount may be reduced relative to payment in non-default. Thus default to payment may lead a firm to financial crisis. Survey result shows that 50% firms have bad debts less than or within estimated figure and 50% have more. About 55% firms have bad debt less than 5%, and 45% firms have more than 5% of sales amount. All of these firms have recovery rate more than 75% of the default amount. 65% of these firms say that they don't have any separate controlling and monitoring mechanism for Bad debts. Whereas the remaining firms say that they have separate controlling mechanism. These results show that the firms are more prone to financial crisis.

*Controlling & Monitoring Accounts Receivables:* In monitoring the collection (turnover) of accounts receivable, management wants to use a methodology that measures the relationship between the firm's receivables and their sales, regardless of fluctuations in sales level. Ideally, the methodology meets at least three criteria; it should not signal a deviation from expectations in the payments behavior of the firms customers when none has occurred. It should signal a deviation when one has occurred. It should be simple to implement and to understand.

Two common methods of receivables monitoring are: 1) Days Sales Outstanding Statistics (Also known as average collection period) and 2) The Aging Fraction Statistics. In our survey 80% of the firms responded that they follow both the DSO and Aging Fractions Statistics as a device of motoring Accounts Receivables. Remaining 20% of the firms responded that they follow only DSO as a device for monitoring Accounts Receivables.

### ***Inventory Management***

Inventory represents an investment and must, therefore, compete with other investment of the firm's. As a consequence, total investment in inventories must be related to some optimum investment level that contributes to the overall wealth maximization object of the shareholders. Since the proper management of inventory has a significant influence on profitability and liquidity, to a large extent, the success and failure of a business depends upon its inventory management performances.

*Composition of Inventory:* In most of the case, a firm maintains raw material, Working-in-process and Finished goods as inventory. Depending on the nature of Business, proportion of inventory held by the firm varies. Even the composition of inventory also varies. In our survey it has been observed that almost all firms hold a huge proportion of Inventory in Current Assets. From the data we retrieve, the proportional investment in Raw Material is highest among the inventories. The following tables are the fact that reflects the above statements. (Industry Average)

(Inventory as a Proportion of Current Asset)

| <i>Current Asset</i>         | <i>04</i> | <i>03</i> | <i>02</i> | <i>01</i> | <i>00</i> |
|------------------------------|-----------|-----------|-----------|-----------|-----------|
| Inventories                  | 54.37     | 49.64     | 46.75     | 65.56     | 21.61     |
| Sundry Debtors               | 15.47     | 11.82     | 11.17     | 16.40     | 5.37      |
| Loans, Advances and Deposits | 9.47      | 8.60      | 7.32      | 10.81     | 3.25      |
| Short Term Loan              | 19.35     | 22.24     | 4.15      | 6.59      | 2.73      |
| Cash and Cash Equivalents    | 1.34      | 7.70      | 30.62     | 0.64      | 9.63      |
| Total Current Asset          | 100       | 100       | 100       | 100       | 100       |

The main reason behind such huge investment is that in pharmaceutical business the firms make every attempt to retain their customers. In doing so, the firms do not want to face any stock out situation. Because, in such case the doctors will not prescribe the product of the firm any more and a substitute product would replace their existing market segment.

(Composition of Inventory; Industry average)

| <i>Common Size Statement of Inventory</i> | <i>04</i> | <i>03</i> | <i>02</i> | <i>01</i> | <i>00</i> |
|-------------------------------------------|-----------|-----------|-----------|-----------|-----------|
| Finished Goods                            | 18.82     | 14.94     | 12.51     | 12.53     | 13.78     |
| Work in Progress                          | 2.30      | 5.13      | 4.91      | 6.58      | 6.63      |
| Raw Material                              | 64.40     | 64.64     | 66.75     | 60.29     | 55.36     |
| Packing Material                          | 6.80      | 6.52      | 6.98      | 7.51      | 6.33      |
| Lab. Chemical                             | 0.04      | 0.04      | 0.05      | 0.03      | 0.03      |
| Literature & Promotional Mat.             | 0.53      | 0.49      | 0.80      | 0.76      | 0.32      |
| Physician Sample                          | 0.17      | 0.22      | 0.38      | 0.52      | 0.53      |
| Raw and Packing Mat in transit.           | 3.54      | 4.78      | 4.83      | 9.18      | 14.31     |
| Stock of Stationary                       | 0.26      | 0.30      | 0.40      | 0.44      | 0.26      |
| Spares & Accessories.                     | 3.14      | 2.95      | 2.39      | 2.16      | 2.46      |
| Total Inventory                           | 100       | 100       | 100       | 100       | 100       |

In addition to this few firms also takes part in Export Business and as a result of this they had to maintain a huge finished good as inventory.

*Procurement of Inventory:* Procurement of inventory is another important aspect of Inventory Management. For Pharmaceutical industry the proportion of Import to Local procurement varies within the range of 60% to 40%, 75% to 25%, 80% to 20%.

*Costing Policy of Inventory:* There are costs involved in maintaining Inventory. The main two costs are: Carrying cost and Ordering Costs. Carrying costs are directly proportional to the level of inventory carried by the firm and include the opportunity cost of inventory investment, insurance on the inventory, storage costs of inventory investment, and so forth. Order costs are directly proportional to the number of orders and incurs in placing & checking an order. Costs of this sort

include set-up costs on machines to produce inventory, costs of generating a purchase order for the inventory. In addition to these there are Obsolesces costs and Stock out costs.

*Lead Time for Inventory:* The lead-time for inventory, in four out of five cases, it was found that it takes 1 to 4 months to import raw material through ship, while in case of procurement the raw material from local market usually it takes 15 days on an average for most of the firms in our survey.

*Static versus Dynamic Problem:* Static Inventory Problem is defined as a situation where the goods have a one period life meaning that they cannot be carried over in the next period. The opposite is the case with Dynamic inventory situation where the firm can use the inventory for more than one period. In our survey we found that the life cycle or the expiration of the inventory for most of the companies (4/5) is more than 24 months. A few of them (1/5) are using inventory for less than 6 months.

*Replenishment Rate for Inventory:* An infinite replenishment defined as a situation where the order quantity is obtained at once. In opposite, finite replenishment is defined as gradual pilling up of inventory. In this regard the survey result indicates that 60% of the companies experiences infinite replenishment, while the others (40%) experiences finite replenishment of inventory.

*Order Placing for inventory:* 60% of the firms place order for inventory on the basis of lead-time of inventory procurement. The remaining 30% of the firm places order for inventory considering the present stock of goods and expected time to obtain that goods. Some of these firms maintains pipeline for raw materials.

*Safety Stock Determination:* Although all the firms maintains the huge level of safety stock to avoid stock out situations, these firms do not follow any structured or any other policy in determining the safety stock level. Past experience of the manager and their subjective judgments are the main to parameters considered.

*Stock out Situation:* Since these firms maintain a large safety stock, they have yet to face any major stock out situation.

*Inventory Controlling Mechanism:* If the firm fails

to control the flow of inventory, it will definitely incur some cost in operation process. There are different methods available for inventory controlling. Physical control and Stock verification are the two most popular methods. In our survey too it has been found that most of the firms are currently using both the physical control and stock verification method. A few firms are also using budgetary control. All the companies use “First in First out” or FIFO method for valuation inventory.

The Most important findings for inventory Management is that almost 80% companies determine the level of inventory to be maintained on the basis of production target and current position of stock. 10% of the firm follows both Inventory Budgeting Method and Present Stock Position in determining the inventory level to be maintained. The remaining 10% of the firms follow EOQ model with relaxed assumptions.

#### **Management of Accruals and Payable**

*Accounts Payable:* A firm can utilize this fund for financing purpose since it is termed as cost free source of fund. Proper Management of Accruals, in fact, can reduce the dependency on Bank loan. The trade credit is one of the main tools for financing working capital.

There are three typical policies for the payment of invoices. The First policy of payment is made on the latest date will allow the buyer to take the cash discount offered in the sellers terms of sale. The Second way of generating additional short –term financing form trade creditors is to delay payment to trade creditors beyond the discount date. The Third policy is to pay the suppliers beyond the due date. This strategy is called stretching accounts payable. Survey indicates that almost all these firms follow a consistent policy in case of payment of invoices. 50% of the firms pay invoices at sight. 45% of these firms pay on due date. The remaining 5% of the firms pay either within the discount date or just after the discount period. Thus, only a few firms follow a policy of ‘Stretching the Accounts Payables’. A review of the financial statements of these firms also reveal that 50% of these firms finance Working Capital using Trade Credit and the remaining 50% of the firms are dependent more on Short Term Bank loan. Another interesting result form our survey is that almost all of the firms use Inventory as security collateral incase of borrowing from banks. It is also found that 75% of

the firms use bonded Warehouse Financing and remaining use specific lien.

**Accruals:** However, firms also incur other types of liabilities for which immediate payments are not required, like the labor of executive and hourly employees, accumulate interest expense on borrowed funds etc. Any such accrual involves a delay in payment and thus it is a potential source of financing. Our survey result indicates that in case of accruals payment companies usually pay on due date. Again a review of the financial statements of these firms indicates that on an average these firms have a lower percentage (ranging from 7.5% to 9%) of accruals to the total current liability.

## V. ANALYZING PERFORMANCE

In this section we will focus on basic ratio analysis of the industry as a whole. These ratios were specially selected to evaluate working capital policy of these firms. Next we have focused on the impact of specific ratios related to working capital on the profitability as a whole. In the last part of the analysis we have presented a Discriminating Function that differentiate the good firms from bad ones.

### Ratio Analysis

In case of ratio analysis, only liquidity and Efficiency dimension of the Industry has been evaluated. These results are presented below:

#### **Liquidity Dimension:**

Liquidity ratio like current ratio, quick ratio and cash ratio, measures the ability of the firm to meet its short-term obligations. These ratios establish relation between cash and other current asset and current liabilities. Creditors are using these ratios to evaluate the creditworthiness of a firm. These ratios also provide reveals management's policy in managing liquidity position of the firm.

Time series data of *current ratio* has shown an upward trend. A closer look into the individual firm's current ratio shows 75% of the firms are keeping this ratio lower, 12% are keeping this higher and 13% are keeping this closer to the industry weighted average. *Quick ratio*, which exclude inventory from current assets, has an upward trend for the last 4 years although for the last two years it was relatively constant. A close

insight into the individual firm's quick ratio, we see 87% firms are keeping the ratio lower and 13% are keeping of higher than the industry.

*Cash ratio* looks how much cash the firm has in hand or at bank to meet its financial obligations. It has a down word trend into the industry-weighted average for the last five years. It also reveals 75% of the firms are keeping lower and 25% of the firms keeping higher cash ratio over the years, than the industry norm.

#### **Efficiency Dimension:**

Efficiency or Activity ratios are used to evaluate the efficiency, with which the firm manages and utilizes its asset. These ratios also called the turnover ratios because they indicate the speed with which the assets are converted or turnover into sales. The result shows an upward trend over the last couple of years for *account receivable turnover*. 87% of the firms are maintaining higher turnover ratios following a tight credit policy and 13% of the firms are maintaining lower account receivable turnover ratio than the industry norm which indicates a relax credit policy.

Data shows an upward trend for the industry weighted average of *account receivable turnover* in days for the last few years. A close insight to the individual firm's ratio shows that 50% firms are maintaining a higher average, which implies the firms cash balance, is being tied up for a longer period of time. Remaining 50% firms are maintaining a lower average collection period than industry-weighted average, which indicates that the firm's credit accounts are being collected rapidly. The data of industry-weighted *average of inventory turnover ratio* shows that, the ratio remains relatively unchanged over the last few years. 62% firms are maintaining a higher inventory turn over ratio, 12% are maintaining the ratio very closer to the industry and 25% of the firms are maintaining ratio lower than the industry norm.

Industry is maintaining a constant *inventory turn over in days* for the last few years. Past data of individual firm's ratio shows that 60% firms have a lower ratio than the industry norms and 40% firms have higher inventory turnover ratio.

Analysis of the industry-weighted average *account payable turnover ratio* has given a downward trend for the last 5 years and very significantly over the

years. Historical data of individual firm's ratio indicates that 62% firms are maintaining a lower ratio and 38% firms are maintaining a higher ratio than the industry norms.

Historical data of industry-weighted average of *account payable turnover ratio in days* shows an upward trend for few years but a significant decline in last (2004) year. The 50% firms are maintaining a higher ratio, which indicates firms will take longer time period to turn account payable due. On the other hand, 50% firms are maintaining lower ratio than the industry norm, which indicates firms are keeping low account payable and paying out the major.

The industry-weighted average *operating cycle ratio* for last few years has an upward trend. Individual firm's ratio indicates 50% of the firms are keeping the cycle higher and 50% of the firms are keeping the cycle lower than the industry ratio.

Industry weighted average of the *cash conversion cycle ratio* shows an upward trend for the last few years. 50% of the firms are maintaining the cycle higher than the industry norms and 50% of the firms are maintaining the cycle lower than the industry norms.

## VI. ECONOMETRIC MODELING

In this section we have constructed a model that indicates the impact of working capital policy of the overall profitability of the firms in the industry. And for this paper has gathered secondary time series data from annual report of each firm.

### Model

In this model an attempt has been made to trace out the impact of overall working capital policy on the industry's ROA. Here it has been hypothesized that the ROA will increase if the firm follows an aggressive working capital policy followed by a conservative approach in financing the working capital policy. Aggressive approach will enable the firm to invest less in current asset thereby incurring lower opportunity cost. On the other hand following a conservative policy will enable the firm to avail the opportunity of leverage effect on ROA. It has also been assumed that the firms can also increase its ROA by lowering the inventory turnover in days.

We have selected a number of variables to construct the model and finally settled with the following best variables on the basis of their partial correlation coefficient. Thus the model is:

$$\text{ROA} = -64.210 + 0.513 \text{ ITID} - 0.432 \text{ CASA} - 1.498 \text{ CLTA} + E_{it}$$

### Model Summary

| Model | R     | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------|----------|-------------------|----------------------------|---------------|
| 1     | .957a | .915     | .852              | 1.7032                     | 1.942         |

- a. Predictors: (Constant), CL to TA, CA to Sales, ITID  
b. The adjusted R-square of the

The adjusted R-square of the model of the model indicates 91.5% variation in ROA of Industry can be explained by the regression model. The unexplained part of the model is the error term. The Durbin – Watson test indicates that there exists no auto-correlation in the model where the value of D-W statistic = 1.942.

### Coefficients<sup>a</sup>

| Model        | Unstandardized Coefficients |            | Standardized Coefficients | t      |
|--------------|-----------------------------|------------|---------------------------|--------|
|              | B                           | Std. Error | Beta                      |        |
| 1 (Constant) | -64.210                     | 19.346     |                           | -3.319 |
| ITID         | .513                        | .099       | .779                      | 5.195  |
| CA to Sales  | -.432                       | .118       | -.537                     | -3.668 |
| CL to TA     | -1.498                      | .433       | -.522                     | -3.458 |

a. Dependent Variable: ROA

The above table indicates the coefficient of the regression equation. From the table it can also be inferred that the variables have a coefficient that are significant at d.f. = 7 with 1% level of significance. Another thing is that the variables in the model are free from Multicollinearity.

### Policy Implication for firms:

Considering the coefficients and their significance level we can conclude that in Pharmaceutical Industry, the nature of working capital policy (CA to SA), financing of working capital (CL to TA) and inventory holdings (Inventory Turnover in Days) play a vital role in determining the level of ROA.

The model says that the firm can increase its ROA by following more aggressive policy towards Working Capital or simply by keeping low current assets and simultaneously the firms has to follow a conservative approach in financing the current assets that means it would be better for the firms if they finance the working capitals by medium term loans rather than short term. Interesting findings of this model is that it suggests an increase in inventory turnover in days. Normally for any business venture it is something that any financial manager may not accept, but in case of Pharmaceuticals industry reverse trend can be observed. In our survey, we found that the firms are maintaining a huge level of inventory especially finished goods just only to keep its target consumer satisfied or to protect the consumer loyalty towards the specific product. Thus the model reveals the overall impact of working capital policy to ROA.

### Two Group Discriminant Analyses

In this section a special emphasis has been given to detect the good and bad firms in the Pharmaceutical industry based on specific ratios related to Working Capital Management. A discriminant function has been developed for this purpose. The methodological aspect, results and its interpretations are described in this section.

#### Rationale for the Discriminant Analysis:

In developing the discriminant function it has been hypothesized that a firm in the Pharmaceutical Industry can become a good firm if it properly manage its cash and Inventory and can be treated as bad firm it is fails to manage them properly. There is lot many factors that should be considered in determining the good or bad status of the firm, but in our case the selection of variables were limited by the ratios related to Working Capital. Maintaining huge liquidity and experiencing Liquidity crisis both are extreme points. Thus the firms need to tradeoff between these two points, since it has been repeated several times that inability to manage cash properly will lead to financial disequilibrium and it will eventually lead to Bankruptcy. On the other hand, if the firm fails to manage inventory properly then its opportunity cost will increase and the firm will depend more on short-term bank loan to finance the inventory. Thus these two variables have the ability to differentiate two firms.

#### Multicollinearity Issue:

In order construct the Discriminating Function, we have primarily concentrated on five ratios. These five ratios are: cash ratio, current ratio, quick ratio, current ratio to sales ratio, current liability to total asset ratio. From our data analysis it was found that Current ratio and the Quick ratio are highly positively correlated based on both the Pearson and Rank correlation. The Partial Correlation result also gives us the similar indication; where all the other three ratios were controlled. Similarly the data analysis reveled that the Cash ratio and Current liability to Total assets are moderately positively correlated. To avoid the problem of Multicollinearity, current and quick ratios were not selected in at a time and same as to cash ratio and current liability to total asset ratio. Given this fact, different combinations of these variables were computed and were tested to determine to what extent these combinations are acceptable. From the result, considering the highest difference in the means between the two groups, the two variables that were selected are Quick and Cash ratio.

#### Discriminant Function:

The Standardized Canonical Discrimination Function that has been developed is:

$$Z = 0.558 \text{ Q/R} + 0.527 \text{ CASHR}$$

The following table indicates the Statistical Significance of the coefficient in the equation:

#### Tests of Equality of Group Means

|       | Wilks' Lambda | f      | df1 | df2 | Sig. |
|-------|---------------|--------|-----|-----|------|
| QR    | .369          | 10.244 | 1   | 6   | .019 |
| CASHR | .374          | 10.042 | 1   | 6   | .019 |

At significance level  $\alpha = 0.025$  and  $\alpha = 0.050$ , with degrees of freedom  $V_1=1$  and  $V_2=6$ , the  $F_{\text{Calculated}} > F_{\text{Tabulated}}$  that means we cannot accept the Null hypothesis ( $H_0$ ) and Alternate Hypothesis ( $H_1$ ) is accepted that the mean value of the ratio of one group is significantly different the other groups. The similar result can be inferred from the Wilk's lambda. Using the above function the Centroids for the two groups, are Group's Centroids can be used to interpret the discriminant function resulting from the Global or Overall perspective. The Mean Value of the Bad firms is  $-0.705$  and the Mean Value of

the Good firm is 2.116 if these two coefficients are used for discrimination.

Functions at Group Centroids

| Function |       |
|----------|-------|
| 1        |       |
| NATURE   |       |
| .00      | -.705 |
| 1.00     | 2.116 |

Unstandardized canonical discriminant functions evaluated at group means

The following Table indicates the discriminating power of the two variables used in the function:

Structure Matrix

| Function |      |
|----------|------|
| 1        |      |
| QR       | .926 |
| CASHR    | .917 |

Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions  
Variables ordered by absolute size of correlation within function

The structured matrix indicates the discriminant loadings that indicate the discriminating power of the coefficient in the model. From the table above, it can be inferred that Quick Ratio has more Discriminating Power than Cash Ratio.

#### Assessing the Overall Fit:

Eigenvalues

| Function | Eigenvalue         | % of Variance | Cumulative % | Canonical Correlation |
|----------|--------------------|---------------|--------------|-----------------------|
| 1        | 1.990 <sup>a</sup> | 100.0         | 100.0        | .816                  |

a. First 1 canonical discriminant functions were used in analysis.

The above table indicates the overall fitness of the model. The Canonical correlation of the model is 0.816 or  $R^2=0.61$ , indicating that 61.0% of the variance in the dependent variable can be explained by this model, which includes only two independent variables.

The Classification Matrix for the estimation Sample is as follows:

Classification Results <sup>a</sup>

| NATURE   |       |      | Predicted Group Membership |      | Total |
|----------|-------|------|----------------------------|------|-------|
| Original | Count | .00  | 6                          | 0    | 6     |
|          |       | 1.00 | 1                          | 1    | 2     |
|          | %     | .00  | 100.0                      | .0   | 100.0 |
|          |       | 1.00 | 50.0                       | 50.0 | 100.0 |

a. 87.5% of original grouped cases correctly classified.

The Classification Table indicates the Prediction Power of the model for the Year 95. The Prediction Power of the Model is 87.5%. The Model has a one Type Two Error. These two tables indicate that the model has the power to discriminate the two groups assumed in the estimation process. The cutoff point in this case is 'Z'=0.467015. The Firms above this 'Z' are considered to be good firm and firms below this 'Z' are considered to be Bad firm.

#### Estimating the Prediction Power:

Generally a Discriminant Function Classify the two groups most predictably in the year when it is estimated. Its Prediction Power declines in the years prior to the year of estimation. In our case the following Table indicates the number of correct prediction prior to the estimation year:

| Function                    | 03    | 02    | 01    | 00    |
|-----------------------------|-------|-------|-------|-------|
| Y=0.558 C/R<br>+0.527 CASHR | 62.5% | 62.5% | 87.5% | 87.5% |

Although the Prediction Power of the model declines in the 94 and 93 but it has increased in 92 and 91 meaning that the function has even proved to be significant in years prior to the estimation period. The following table indicates the Type One and Type Two error:

| Error          | 03 | 02 | 01 | 00 |
|----------------|----|----|----|----|
| Type One Error | 1  | 1  | 0  | 0  |
| Type Two Error | 1  | 1  | 1  | 1  |

In all these year the model has predicted GPL as a good firm where the firm is actually a bad one thus committing a Type Two error. Whereas in 93 and 94 Reneta has been predicted as a bad firm but it actually is a good firm, indicating a Type One error. Usually, Type One Error occurs when the firm makes any adjustment in its operation process to avoid probable failure. Where Type Two Error actually indicates the firm is not using its full potential deliberately.

In this case, determination of Cutoff Score and determination Actual Status has to be clarified.

#### Policy Implication for the Firms:

For the firms in the Pharmaceutical Industry it very important to maintain a certain level of cash balance and to manage the inventory Level

effectively. If the firms fail to manage either of these two, it may perform poorly relative to other firms in the industry that will well put a big question mark on the overall efficiency of management.

## VII. CONCLUSION

Pharmaceutical Industry in our country is a profitable sector. It is due to the reason that the firms in the industry are very competitive and has gained efficiency in managing its resources competently. The impact of overall working capital policy on profitability in this industry is proved to be significant and the ratios related to working capital can explain the differences between the firms. A positive correlation has been found in the mathematical model, between current asset management and financial performance of Pharmaceutical firms. Thus it is evident that for the overall performance of this industry, working capital plays a vital role.

Our findings from the questionnaire, indicates that the sample firms in the industry have been efficient in managing Cash, Account Receivables and Payables. For this industry, maintaining large volume of Inventory doesn't reflect inefficient management.

Thus the bottom line is that the firms industry should be cautious in formulating Working Capital Policies

## REFERENCES

- [1] B. K. Stone and R. W. Wood, "Daily Cash Forecasting: A Simple Method for Implementing the Distribution Approach," *Financial Management* (Fall 1977), p. 40-50.
- [2] Baumol, William, "The Transactions Demand for Cash: An Inventory Theoretic Approach," *Quarterly Journal of Economics* (November 1952), p. 545-56.
- [3] Bierman, H., K. Chopra, and L. J. Thomas, "Ruin Considerations: Optimal Working Capital and Capital Structure," *Journal of Financial and Quantitative Analysis* (March 1975), p. 119-28.
- [4] Daellenbach, Hans, "Are Cash Management Optimization Models Worthwhile?" *Journal of Financial and Quantitative Analysis* (September 1974), p. 607-26.
- [5] Emery, G. "A Pure Financial Explanation for Trade Credit," *Journal of Financial and Quantitative Analysis*, Vol. 19, No. 3 (September 1984), p. 271-85.
- [6] E. Farragher, "Factoring Account Receivable," *Journal of Cash Management* (March/April 1986), Page 39.
- [7] F. Scherr, "Estimating and Using Failure-Forecasting Functions: Some Problems and Some Proposed Solution," *Baylor Business Studies* (January 1982), pp.16.
- [8] Farragher, E., "Factoring Accounts Receivable," *Journal of Cash Management* (March – April, 1986).
- [9] James Vander Weide and Steven Maier, "Managing Corporate Liquidity: An Introduction to Working Capital Management," (New York: John Wiley, 1985), p. 4.
- [10] Kamath R., S. Khaksari, H Meier, and J. Winklepleck, "Management of Excess Cash: Practices and Development," *Financial Management* (Autumn 1985), pp. 70-77.
- [11] Lawrence Gitman, D. Keith Forrester, and John R. Forrester, "Maximizing Cash Disbursement Float," *Financial Management* (Summer 1976), p 15-24.
- [12] Lewellen, W. G., and R. W. Johnson, "Better Way to Monitor Accounts Receivable," *Harvard Business Review* (May-June 1972), p. 101-109.
- [13] N. Hill, "A Generalized Cash Flow Approach to Short-term Financial Decision," *Journal of Finance*, Vol.38, No. 2 (May 1983), pp. 349-60.
- [14] N. Hill, W. Sartoris, and D. Ferguson, "Corporate Credit and Payable Policy: A Survey Size and Industry Effects," paper presented at the Financial Management Association's 1983 Annual Meeting.
- [15] Smith, J. K., "Trade Credit and Information Asymmetry," *Journal of Finance* (September 1987), p. 863-872.