CHAPTER III

APPROACHES TO THE STUDY OF WORKING CAPITAL MANAGEMENT
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Different authors have analyzed working capital management in different ways. A review of these analyses is important in order to develop an approach that can be employed in the context of the study of selected sugar industries of Tamil Nadu. Therefore, the present chapter reviews the various approaches to the study of working capital management which are presented in five sections under the heading (i) Risk-Return Trade Off; (ii) Liquidity Analysis; (iii) Structure and Utilization of working capital; (iv) Empirical works on the demand for Cash and Inventories; (v) Recommendations of Working Capital Committees.

RISK - RETURN TRADE OFF

In one way or another, the major inference of most of the studies concerning approaches to working capital decision-making centres around risk-return trade off. This can be seen by examining important available literature for their various approaches to management of aggregate working capital.

Sagan (1955)\(^1\) in his study discussed mainly the role and function of the money manager who is directly concerned with the management of cash that is generated in the course of business transactions. He stressed that more emphasis was laid on
the money manager's job. He suggested that the preparation and analysis of a cashflow schedule was a basic factor to achieve a successful programme of money management. Sagan also pointed out that the level of operational cash needs depends primarily on the level of sales.

The Walker (1964)\(^2\) study towards a theory of working capital is a lot more improvement upon the Sagan study. His main argument was that it was possible to develop a theory of working capital. In this connection, he developed the following propositions which imply a risk-return trade off of working capital management.

(i) If working capital is varied to sales, amount of risk that a firm assumes is also varied and the opportunity for gain or loss is increased.

(ii) Capital should be invested in each component of working capital as long as the equity-network position of the firm increases.

(iii) The type of capital used to finance working capital directly affects the amount of risk that a firm assumes; as well as

(iv) The greater the disparity between the maturities of a firm's short-term debt instruments and its flow of internally generated funds, the greater the risk and vice versa.
He indicated that changes in working capital in certain industries cause the rate of return on investment to react more favourably than in others. It showed a kind of negative relationship that exists between the level of working capital and the rate of return.

If the Sagan study states that the level of working capital is a function of sales, the Walker study states that it is a function of output. Therefore, both the studies do not differ significantly so far as the major determinant of the level of working capital is concerned. However, Walker goes beyond it by indicating that the working capital level also varies directly with management's attitude towards risk.

The Van Horne (1969) study examined separately the level of a firm's liquid assets and the maturity composition of its debt in order to illustrate the respective trade off between risk and return. The study emphasized the fact that the lower the level of liquid assets the greater the risk of not being able to meet current obligations. The risk of technical insolvency can be minimized by maintaining a high proportion of liquid assets. However, this strategy would affect the return on investment. Thus, the decision concerning a liquid asset balance is a matter of risk-return trade off. Generally, the longer the maturity schedule of debt, the less risky would be the debt financing of the firm. However, his study added to it by stating
that the relationship also exists between the maturity schedule and the cost of debt. The longer the maturity schedule, the more costly is likely to be the financing and vice versa.

According to Leslie R. Howard (1971), working capital may be regarded as the lifeblood of a business; its effective provision can do much to ensure the success of a business, while its inefficient management can lead not only to loss of profits but also to the ultimate downfall of what otherwise might be considered as a promising concern. A deeper understanding of the importance of working capital and its satisfactory provisions can lead not only to material savings in the economical use of capital but can also assist in furthering the ultimate aim of a business, i.e., maximizing financial returns on the minimum amount of capital which need be employed.

Knight (1972) in his study basically argued that optimizing models dealing with single working capital accounts independently may produce inconsistent results as compared to the models that give simultaneous treatment to each working capital account. He presented reserve-stock models, applied successfully to inventories, simultaneously to inventories and receivables, and to cash, to disclose their implications which are found in their simultaneous interrelationship of variables. He suggested that the area of simultaneity must be extended to all the elements including revenue, cost and risk factor involved in profit planning.
S.K. Chakraborty (1973), opined that working capital is a segment of capital employed. Since return on the capital employed is an aggregate measure of the overall efficiency in conducting a business, it pointed out the excessive working capital would lower the capital turnover ratio and so bring down the overall return on capital employed. Similarly, too small amount of working capital, though it yields an immediate higher return on the capital employed, may reduce the earning capacity of the fixed capital employed over the succeeding periods. He suggested that operating cycle concept draws attention towards the need for concerted credit management against the broader perspective of better working capital management and higher return on capital employed.

The first study of Smith (1974) described dual goals of profitability and liquidity and suggested that the job of financial managers is to achieve a trade off between the two. He illustrated his idea by using the rate of return on equity investment as a measure of profitability and net working capital and current ratio as a measure of liquidity. His study also indicated simulating future financial statements of a firm based on a set of simultaneous equations. He presented their model in which Current Assets (CA) and Current Liability (CL) are directly related to firm sales (S).
CA = f_1(S) \ldots \ (1) \\
CL = f_2(S) \ldots \ (2)

This is to show that the individual working capital accounts can be treated separately in a larger simulation system.

The second study of Smith (1974)^8 relates to profitability versus liquidity trade off in working capital management. The study suggested that parallel monthly forecasts of liquidity and profitability can be useful in evaluating trade off between these two goals. He stressed that such forecast can also be useful in estimating the impact of certain working capital policies on these goals, and in reflecting the uncertainty of the future. This study also discussed individual and collective effects of accounts receivables, inventories, accounts payable, and other accruals on profitability and liquidity.

The Bierman, Chopra and Thomas (1975)^9 study was an attempt to inter-relate working capital and capital structure decisions with the working capital used not only as a buffer to avoid ruin but also to affect sales. The study assumed that working capital level affects both the expected earnings and the variance of earnings. The study states that if \( W \) is the amount of working capital, \( W^* \) is the optimum level of it, \( S_0 \) is the initial amount of equity, the loss of \( W^* \) is the ruin which would reduce equity to \( S_0 - W^* \) and the firm is made to borrow \( g(S_0 - W^*) \), where \( g \) is a constant between 0 and 1 . It is assumed that \( W = W^* \) before the ruin occurs. After the firm borrows \( g(S_0 - W^*) \), the firm will
again return to $W^*$. Given a certain level of revenues, dividends can be paid only after paying interest on long-term debt and reaching $W^*$.

According to John J. Hampton (1983)\(^{10}\) the working capital management is the functional area of finance that covers all the current accounts of the firm. It is concerned with the adequacy of current assets as well as the level of risk posed by current liabilities. He also viewed that the firm's policies for managing its working capital should be designed to achieve three goals such as adequate liquidity, minimization of risk and contribute to maximizing firm value.

According to Arthur J. Keown, David F. Scoh, Jr. John D. Martin and J. William Petty (1985)\(^{11}\), working capital management involves managing the firm's liquidity, managing the firm's investment in current assets and its use of current liabilities. Each of these problems was shown to involve risk-return trade off, investing in current assets was found to reduce the firm's risk of illiquidity at the expense of lowering its overall rate of return on its investment in assets. Furthermore, the use of long term sources of financing was found to enhance the firm's liquidity while reducing its rate of return on assets.

From the above, it is clear that the various authors have developed the various propositions such as management attitude towards risk, maturity schedule of debt, material savings
in the economical use of capital, simultaneous treatment to each element of working capital, operating cycle concept, parallel monthly forecasts of liquidity and profitability and capital structure decisions, which can be useful in evaluating risk-return trade off of working capital management. In addition, the authors are of the view that the level of working capital is a function of sales and output.

LIQUIDITY ANALYSIS

Management of working capital is crucial for the success of an enterprise. The adequacy of current asset, together with their efficient handling, virtually determines the survival (liquidity) of a business concern. Working capital is said to be life-blood and nerve centre of an undertaking. A brief review of the dispersed efforts as research in the field of liquidity is attempted in the following paragraphs.

M.H.B. Abd.El.Mataal (1958)\(^{12}\) found that failure of business is undoubtedly due to poor management and absence of management skill. Shortage of working capital, so often advanced as the main cause of failure of an industrial concern, is nothing but the clearest evidence of mismanagement of it which is so common. He rightly pointed out that inadequacy of working capital is a symptom and some times an excuse, but by no means the cause of business failure.
According to O’Donnell and Goldberg (1964), the adequacy of cash and other current assets together with their efficient handling virtually determines the survival or demise of an enterprise. Many a time business failure takes place due to lack of working capital.

Louis K. Brandt (1965) described that the stability and security that results to the business and its owners increase as funds invested in working capital increase, but by the same act this produces an unfavourable balance between working capital and fixed capital that might have unfavorable effects on long-run returns to the stock holders. We need to know more about where to look for working capital funds, how to use them, and how to measure, plan and control them.

The Welter (1970) study is quite a distinct one from the earlier studies on working capital. It was devoted to the calculation of savings possible through reduction of working capital. His study first requires to specify the delay centres along with costs borne by them. After specifying the delay centres and costs borne by them, the study requires to calculate the working capital tied up in each delay centre with the help of additional information regarding average delay and added value. In order to assess whether saving is possible through reduction of working capital or not, the study suggested the working out of the possibility of reducing the various delays occurring in delay
centres. The study further highlighted the fact that the firm could reduce average delay so as to generate savings possible through reduction of working capital if it could change the distribution of average delays favourably.

Roger A. Cossaboom (1971)\textsuperscript{16} in his study described that the profitability -liquidity trade off has been getting top billing by many management teams lately. The study suggested that there are four aspects such as Liquidity, Flexibility, Sensitivity Innovation and Segmental financing which financial managers should examine to reduce their firms' vulnerability to further liquidity squeezes. Among the four approach, financing flexibility and innovation by financial managers may be the best approach for future liquidity management.

The linkages between credit, inventory or short-term borrowing policies in order to determine optimal working capital policies were also indicated by the L.J. Merville and L.A. Tavis (1973)\textsuperscript{17}. They rightly pointed out that the current liabilities of a firm are the stock reflection of closely interrelated operational and financial cashflows and unless the net effect of these combined flows is recognized, the search for optimal credit, inventory or short-term borrowing policies will not become complete.

Weston and Brigham (1975)\textsuperscript{18} rightly stated that there are many aspects of working capital management which make it
an important function of the financial manager. On the one hand, it maintains proper liquidity, while on the other hand, it helps in increasing the profitability of the concern.

James E. Gentry (1976), hypothesized a relationship between profitability and liquidity as perceived by business managers unlike the frequently assumed negative relationship. This relationship may not be continuously linear but rather have the shape of an inverted tea cup.

The Yardeni (1978) study relates to the application of the portfolio-balance framework to an empirical study of the portfolio behavior with special focus on management of the working capital portfolio of non-financial corporations. For this model, the study assumed that current assets and liabilities as well as equity were treated as exogenous variables and current assets and current liabilities were treated as indigenous. This study indicated that it is often required to determine the optimal composition of the portfolio of current assets and current liabilities with the help of the following:

\[ 1 = \frac{DD}{W} + \frac{LAPT}{W} + \frac{INV}{W} + \frac{NAR}{W} - \frac{BL}{W} \]

Where \[ W = DT + E - NCA. \]

LAPT = LA - PTL.
NAR = AR - AP.
DD = Cash and Demand Deposits
After computing the short-term and long-term co-efficients of the model, the Yardeni study pointed out that the short run changes in independent variables as sales, new orders and interest rates do influence current assets and current liabilities significantly.

According to V.E. Ramamoorthy (1978)²¹, profitability and solvency are the twin objectives of working capital management. Survival and growth of the company thus depend on its ability to meet the two sets of profitability and solvency. He also viewed that if liquid assets are adequate to pay off current liabilities, a feeling of confidence in the financial strength of the company is automatically created and its credit reputation is sustained.

Lambrix and Singhvi (1979)²² suggested that the financial executives of firms should understand the factors that determine the length of working capital cycle and consequently try
to optimize the level of their working capital investment. They also suggested that the "Predetermined decision" level of working capital must be examined in relation to profitability measured by the return on net assets. They developed check-lists that are classified by components of the working capital cycle with the objective of assisting a firm in identifying and resolving working capital problem areas.

Dr. N.K.Kulshrestha (1980)\textsuperscript{23}, in his study, stressed that corporate liquidity is a vital factor in business. Excess liquidity, though a guarantor of solvency would reflect lower profitability, deterioration in managerial efficiency through complacency, increased speculation and unjustified expansion, extension of too liberal credit and dividend policies. Too little liquidity then may lead to frustration of business objections, reduced rate of return, business opportunities missed and weakening of morale. The control of liquidity requires active working capital management.

Shri. U. Pancras(1981)\textsuperscript{24}, develops a system for the time adjustment of current assets through the process of discounting and close selection to arrive at real liquidity position, illustrating his point with balance sheet figures of an engineering company. The calculation of discount factor is given below.
Discount factor = \( \frac{1}{(1+r/100)^n} \)

\( n \) = Total cycle time taken to convert cash to Raw material then to Finished goods and immediately back to cash.

\( r \) = Annual earning rate or the borrowing rate whichever is higher.

He stressed that to the banker the time adjusted current ratio would provide invaluable information relating to the quality of the financial management with regard to working capital.

Dr. B. Banerjee (1982)\(^{25}\), conducted a study on the corporate liquidity and profitability in India. The study related to the periods 1970-71 to 1977-78. The purpose of the study was to analysis the trend of liquidity position and its relationship with the profitability in the medium and large public limited companies in the corporate sector in India. The study concluded that in India there are some industry/industry groups where a risk in liquidity will lead to rise in profitability and vice-versa; there are others, where increase in liquidity will be associated with a decline in profitability.

S.N.Sarma and A.V. Reddy (1985)\(^{26}\) made a study on the liquidity position of the Nizam Sugar Factories Limited (NSF) during the years 1972-73 and 1981-82 and to identify the factors influencing the liquidity. The study concluded that the major element that is affecting the liquidity position of the firm is the government policies with respect to the input and output as well.
Dr. B.R. Reddy (1988)\textsuperscript{27} in his study, stressed that the co-operative sugar mills have to go a long way in the proper management of the working capital. Problems may arise on account of seasonal character of the industry, but the absence of networking capital is a grave danger for the mills. He also stressed that sustained efforts have to be made to maintain liquidity and sufficient amount of net working capital in order to avoid the potential danger of technical insolvency.

John J. Hampton and Cecilia, Wagner (1989)\textsuperscript{28}, in their study used the techniques of financial analysis to address issues of working capital adequacy. Guidelines had been developed on methods of evaluating cash, current assets, quick assets, current liabilities, and overall adequacy. Their study also developed an Electronic spreadsheet model to bring all the measures together and allow the analyst to compare the firm's ratios with norms taken from similar firms.

It is clear from the above references that various authors have viewed that maintaining proper liquidity together with its efficient handling should have favourable effects on long-run returns and it determines the survival or demise of an enterprise. Further, financial strength of the company is created and its credit reputation is sustained. Inadequate liquidity creates potential danger of technical
insolvency. The various models such as, relation with operational and financial cashflows, Discounted current ratio and portfolio-balance framework model are suggested to have better liquidity management. Further, the studies suggests that financial flexibility, sensitivity, innovation by financial managers and segmental financing are the best approach for future liquidity management.

STRUCTURE AND UTILIZATION OF WORKING CAPITAL

In addition to the above studies, there are also studies on working capital management which deal exclusively with structure and utilization of working capital in the context of Indian Industries. The major findings of the approaches used in these important studies are presented briefly in this section.

National Council of Applied Economic Research (NCAER) (1966), carried out a study on the structure of working capital with special reference to three industries namely, fertilizers, Cement and Sugar. The study was mainly devoted to the analysis of composition of the working capital in these industries for the period 1959-1963. The study pointed out that an indication of the effective utilization of working capital and its requirements for an industry should increase less than in proportion to the increase in the volume of output. But it is difficult to quantify that optimum rate at which the demand for working capital should increase in response to an increase in the
volume of output. The study also pointed out that the control of inventory had not received proper attention. However, NCAER failed to put into sharp focus the various problems involved in the management of different components of working capital.

Nalini Ambegaokar (1969)\textsuperscript{30}, Economic Department, Reserve Bank of India conducted a study on working capital requirements and availability of bank credit in Indian processing and manufacturing industries. The main findings may briefly be stated as follows:

(i) Industries have increasingly relied on bank credit for financing a large part of their working capital requirements.

(ii) Although it is difficult to determine a 'norm' for the quantum of inventories, some relationships in the growth of inventories and output/sales has been indicated.

(iii) The growing dependence of industries on bank credit which is the case of some industries, appeared to be out of proportion with the increase in their output.

According to B. Banerjee (1973)\textsuperscript{31}, credit sales and their impact on the working capital are one of the most neglected areas in corporate management in India.
R.K. Misra (1975), studied the problems of working capital in the selected Indian public enterprises. The study pointed out that the selected enterprises have not been able to utilize working capital efficiently. In all the selected enterprises, an excess inventory was noticed. For the reduction of over-stocking, the study suggested installing an "Integrated Inventory Management Department" from the very inception of the enterprises. The study also pointed out that the size of cash was on the high side in terms of operational requirements. Its main reason was stated to be the lack of proper planning on control of cash.

To determine the effectiveness of working capital management, Bhattachharyya and Raghhabachari (1977), conducted a study taking 72 large Indian Companies and 14 large Indian banks and financial Institutions. Using eleven ratios namely current ratio \((x_1)\), quick ratio \((x_2)\), average F.G. inventory as number of days' sales \((x_3)\), average raw material as number of days of raw material consumption \((x_4)\), average receivables as number of days' sales \((x_5)\), cash flow as percentage of sales \((x_6)\), creditors as percentage of raw materials consumed \((x_7)\), profit after tax as percentage of sales \((x_8)\), sales as number of times of total assets \((x_9)\), profit after tax as percentage of total assets \((x_{10})\), and debt as percentage of equity \((x_{11})\). The computed discriminant function is given by
If the value of the discriminant function is greater than $D^*$, the company is said to be effective one in managing its working capital. The profitability of misclassification based on the computed discriminant function is 0.065. The analysis further identified the following four factors having substantial importance.

(i) Profit after tax as percentage of sales (25.2%)

(ii) Sales as number of times of total assets (25.2%)

(iii) Quick assets as percentage of current liabilities (15.5%)

(iv) Average receivables as number of days' sales (15.3%)

The study by S.P. Vijaya Saradhi (1980) attempted to highlight the problems of working capital management based on the study of aggregate financial data of public enterprises and as revealed by a few case studies of individual units. The study pointed that the share of inventories in the total current investment was the highest and increased. Cash inflows are affected by delays in realization of bills.
receivable. In the event of shortage of cash, payment to supplier is delayed. These findings clearly indicate that the study was concerned more with a fact-finding process rather than applying techniques or building up models concerning working capital management. The study does not take into account the current liabilities which form an important part of working capital.

N.Mishra (1980)\textsuperscript{35} in his study states that the management of working capital occupies an important place in almost all the textbooks on finance. However, the problems of working capital management during inflation are yet to receive due attention from authors on financial management. His study pointed out that the measures which a financial manager would be required to tackle the problems relating to the management of working capital during inflation includes accounting for price changes, controlling costs, managing inventories, controlling new investments, improving turnover, managing credit and collection, managing creditors, managing cash and exploring other possibilities. The study concluded that under present inflationary conditions management of working capital is perhaps more important than even the management of profits and this problem requires greatest attempt and effort from the financial manager.

N.K. Agrwal (1983)\textsuperscript{36}, in his study also threw some light on the state of working capital management in selected large
manufacturing and trading public limited companies in the private sector. The main findings may briefly be stated as follows:-

(i) In the majority of industries, the working capital per rupee of sales has shown a declining trend over the years.

(ii) The majority of industries have not been able to control liquid resources effectively.

(iii) The average annual percentage growth rate in receivables exceeded the average growth rate in sales.

(iv) In the majority of industries, long-term funds as a percentage of total working capital have registered an upward trend which is mainly due to restrictive flow of bank credit to the industries.

The above findings are based on the computation of a few traditional ratios. It seems as if the limitation of these ratios has not been recognized properly during the study. This study has also revealed that firms in majority of industries under study have failed to plan their working capital requirements properly. In most of the industries, liquid resources have not been controlled and utilized effectively.

R.A. Yadav (1986)\(^3\), in his study develops a multi variable model to establish the determinants of effective working capital management based on a study of 78 companies consisting of 39 sick units. A discriminant model consisting of four variables has been developed as the best discriminant
function in determining the effectiveness of working capital management. The best discriminant function is as under.

\[ Y = 14.5166 \times V_1 + 0.0015 \times V_2 + 0.8715 \times V_3 + 0.7914 \times V_4 \]

Where \( Y \) = Overall discriminant score.

- \( V_1 \) = Cashflow from operation/total Tangible assets
- \( V_2 \) = Current Ratio.
- \( V_3 \) = Net Sales /Total Tangible assets.
- \( V_4 \) = Defensive assets/total operating expenditure.

It is claimed that the model could correctly classify 95 percent of the companies in another sample of 40 companies as "non-effective" in working capital management. The proposed model will be of particular interest to financial institutions for monitoring the effectiveness of working capital management by credit-seeking companies. The study also states that the ratio of cashflow to total tangible assets is the most significant variable followed by net sales to total tangible assets in classifying the companies into sick and healthy in working capital management.

The Reserve Bank of India (1988) conducted a study on finances of public limited companies in 1987-88. The study covered 1953 public limited companies, organized in \((16+1)\) industry groups. The study states that overall, the current assets as percentage of total capital employed in these companies was 54.1 i.e., for every Rs.100 of capital employed, Rs.54.1 was in
current assets. This study gave the following break-up of the co-operation of current assets.

<table>
<thead>
<tr>
<th>Items</th>
<th>% of Total CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Inventories</td>
<td>44.18</td>
</tr>
<tr>
<td>2. Debtors, Loans &amp; Advances</td>
<td>44.00</td>
</tr>
<tr>
<td>3. Quoted Investment</td>
<td>5.54</td>
</tr>
<tr>
<td>4. Cash and Bank Balance</td>
<td>6.28</td>
</tr>
</tbody>
</table>

A.K. Mukherjee (1988)39, conducted a study in 1988 on the management of working capital in public enterprises in respect of Central Government Industrial Undertakings. The study related to the period from 1974-75 to 1978-79. The main findings may briefly be stated as follows.

(i) Increase in current assets was mainly due to accumulation of inventories and liabilities due to increase in financing through payables.

(ii) Overall size of sales and output had significant effect on overall size of working capital.

(iii) The working capital requirements of the units are not ascertained on objective grounds, they are based on considerations other than those suggested for prudent financial management.

(iv) The overall profitability and size of working capital were negatively correlated by significant extent.
(v) There was a very significant negative correlation in between liquidity and owners profitability.

(vi) Over investments in the structural determinants and maintaining huge size of working capital were not at the root of the expansion of the business but were on account of faulty financial policies adopted by the units.

S. Garai and A. Mallik, (1988)40 in their study stated that the role of working capital looked from the other side of the ratio of fixed capital in total capital employed. The income generation process of an industry is studied by taking this ratio as a regressor in non-linear regression model. From their results of the analysis of cross-sectional data for all states and Union Territories of India for 6 industries for 3 years, it was found that this ratio plays an important role in income generating process and an optimum value for this ratio (0.48) may be obtained.

Dr. Harbans Lal Verma (1989)41 made a study in 1989 at the "Punjabi University" on the Management of Working Capital in respect of "Iron and Steel Industry" in India. The sample of this study covered both the public sector and the private sector. The study related to the period from 1978-79 to 1985-86. Verma observed that the problem of working capital in this industry is related more to surplus investments than to inadequacy in the inventory and receivables. But as far as cash
is concerned, almost all the units have experienced inadequacies during the period. He also suggests that this can be tackled through improved co-ordination in the functioning of some strategic departments such as purchase, production, marketing and finance.

Dr. Harbir Singh (1990) in his study states that there are certain areas in which substantial efforts are urgently required to keep the company on an even keel. The company can improve its financial health, if it adopts a technique of more scientific control on raw materials, stores and spares and strives to reduce the unprofitable investment blocked in loans and advances and other current assets. To regulate the cash flow, it is imperative that a weekly cashflow statement and a cash budget be prepared on a regular basis. These measures will hopefully enable the company to make a real breakthrough and place it in the forefront of the Sugar Industry.

Prof. J.D. Agarwal (1991) has developed a multi-objective criterion to the problem of working capital decisions by making use of the potentials of Goal Programming which allows a simultaneous solution of complementary and conflicting objectives rather than a single objective only. The goal programming model may be used for different profit targets, with varying levels of current assets, in order to obtain a satisfying level of the various components of working capital and
the profitability and liquidity goals. It may be concluded that the goal programming model formulated for the management of working capital serves to illustrate the need for a solution where conflicting objectives are defined.

Dr. S. P. Gupta (1991) has argued in favour of working capital control through variance analysis. He was of the opinion that variance analysis may provide useful and relevant information to the management enabling it to exercise timely and effective control over working capital.

K. V. Rao & Chinta Rao (1991) in their study state that the traditional liquidity ratios could not help us to find out the real position regarding the adequacy of the working capital amount involved, but simple regression model is powerful enough to identify the in brooding prevailing in the working capital position and to highlight the ineffective planning and control of working capital.

To conclude, majority of the studies which deal exclusively with structure and utilization of working capital in the context of Indian industries suggest that excessive investment in inventory, receivables and inadequacy of cash, and over-dependence of industries on bank credit are the main causes for the ineffective working capital management. The various models such as Integrated Inventory Management Department
EMPIRICAL WORKS ON THE DEMAND FOR CASH AND INVENTORIES

The object of this section is to present how the demand for cash and inventories by business firms has been approached by the different authors. The hypotheses concerning the demand for working capital and its various components by the selected sugar industries of Tamil Nadu have been formulated on the basis of the review of these empirical works on the demand for cash and inventories.

STUDIES ON THE DEMAND FOR CASH:

The study of short-run behaviour of the demand for cash has been encouraged by the earlier studies of Baumol, Tobin and Friedman.

Baumol (1952)\textsuperscript{46} indicated the applicability of the inventory model in determining the level of cash to be held by the business firms. He described the ordering costs and holding costs of cash in a fashion similar to those costs associated with
inventory. His conclusion was that the rational individual will, given the price level, demand cash in proportion to the square root of the value of this transactions. As per his model, the average long-run cash balance is given by

$$C = \left( \frac{bT}{zi} \right)^{\frac{1}{2}}$$

where, $C$ is the cash balance, $b$ is the transaction cost, $T$ is the dollar value of transactions at a constant price level and $i$ is the capital cost.

James Tobin (1956)\(^47\) in his study explains liquidity preference as behaviour towards risk. His analysis transforms the problem of uncertainty into one involving risk, for liquidity preference may be interpreted as preference for less risky forms of investment. In his model the individual's interest earnings net of transactions costs were maximized. Both Baumol and Tobin mainly indicated that there are important economies of scale in cash holding and an inverse relationship between interest rates and the demand for money.

According to Friedman (1959)\(^48\) the determinants of the demand for money are bonds yields ($r_b$), equity ($r_e$), the rate of change of the price level ($1/p, dp/dt$), the ratio of non-human to human wealth ($W$), the level or real income per capita ($Y/P$) tastes and preferences of wealth owning units and all other factors ($U$). The demand for money function may be written as.

$$\frac{Y}{M} = V \left( r_b, r_e, 1/p, dp/dt, W, Y/P, U \right)$$
His empirical results indicated that the permanent income elasticity was 1.8 and the effect of interest rates on the demand for money was too small to be statistically significant. He concluded that the demand for money is not statistically sensitive to changes in the rate of interest.

The study of Allan. Meltzer (1963) was based on 14 industries for nine different years. He specified the following function as a first approximation to the theory.

\[ M = f(r, w) \]

where, \( M \) is money, the sum of currency and demand deposits of the public, \( r \) is the market rate of interest and \( W \) is the net wealth of the public. He used sales as a proxy for the firms' wealth. In order to arrive at conclusion, he tested three functional forms.

\[
\begin{align*}
\log M &= a + b \log s \\
M &= Ks' \\
M_s &= b + bs' + ds'
\end{align*}
\]

where \( M \) and \( S' \) were defined as cash and sales per firm by dividing the mean value of \( M \) and \( S' \) by the relevant number of firms. He concluded that the demand for money by business firms is a function of sales, linear in logarithms and the rejection of the model of transactions demand with economies of scale suggested by Baumol and Tobin, and Friedman's position that cash balances increase more than proportionately with permanent income.
Frazer (1964)\textsuperscript{50} conducted a study of corporate financial structure and the demand for money where he used quarterly cross-section data for the period 1956 to 1961. He concluded that there do appear to be significant economics in precautionary balances since cash varies less than proportionately with the assets of firms.

Whalen's (1965)\textsuperscript{51} in his attempt to analyse business demand for cash utilized the cross section data for the single year, 1958-59. He estimated the parameters of

\[
\frac{M}{MA} = a_1 + b_1 \frac{S'}{MA} \quad (I)
\]

\[
\frac{M}{MA} = a_2 + b_2 \frac{S'}{MA} + C \frac{S'^{1/2}}{MA} \quad (II)
\]

where \(M\) is money, \(S'\) is sales, and \(MA\) is total of money and income-earning monetary assets. Besides, he also estimated the parameters of two other equations.

\[
\log M = \log a + b \log S' \quad (III)
\]

\[
\log M = \log a + b \log \frac{W}{S'} + C \log S' \quad (IV)
\]

Where \(W\) is the total assets of the firm. His results for equations (I) and (II) indicated the presence of substantial diseconomies in the transactions demand for cash, but, when equation (IV) was used, the regression co-efficient relating to cash and sales was less than 1.

De Allessi (1966)\textsuperscript{52} studied the demand for money for British business firms by applying a methodology very much
similar to Meltzer's. He used the market value of each firm's common stock instead of sales as a proxy for wealth as shown below.

\[ \ln M_t = a_1 + b_1 \ln W_t + U_t \]

Where \( M \) is the cash balances, wealth \( (W) \) and \( U_t \) is the error term. The study mainly revealed that the quantity of money held by firm is positively related to its wealth and the wealth elasticity of money appears to be about one, supporting the results of Meltzer.

The study by Nadiri (1969)\(^5\) was also based on quarterly time series data. According to Nadiri, the demand for real cash balance is given by

\[ M^* = f \left( \frac{C}{W}, V, X^* \right) \]

Where \( M^* \) is the desired level of real cash balances, \( C \) is the user cost of capital services, \( W \) is the price of labour services, \( X^* \) is the expected level of output, and \( V \) is the opportunity cost of holding money. Nadiri observed that the income elasticities of real cash balances were consistently less than unity. This finding supported the theoretical propositions on Baumol and Tobin and contradicted Friedman's high income elasticity. The interest rate elasticity had a negative co-efficient and was statistically significant at the 5 percent level of significance.

L.M. Bhole (1979)\(^5\) made an empirical study of liquidity preference of corporate sector in India for the period
1951-74. He used the data relating to the functioning of the sample of non-financial, non-government Medium and Large Public Limited Companies in India. In this study regression models were fitted to the data to estimate the magnitudes of elasticities of different variables viz., sales income, rate of interest, price level, inventory holding and net receivables. He concluded that the income elasticity and price elasticity on corporate demand for money falls in Friedman's line of evidence on this subject.

Kamta Prasad and R.K. Sampath (1979) \(^{55}\) investigated empirically the transactions demand for cash in the corporate sector of the Indian economy during the period 1950-51 to 1970-71. They observed that since the estimated value of transactions elasticity demand for majority of industries is less than unity, it indicates that there exists significant economics of scale in holding cash balances in the corporate sector.

Ashok Kumar Lahiri's (1981) \(^{56}\) study on "Liquidity behaviour of Indian business firms" presents some independent evidence for the period, 1971-74 in support of the existence of economics of scale and inter-industry differences. He found that in majority of the industries the elasticity coefficient is substantially less than unity. This indicates the existence of economics of scale in money.

Dr. Radhe S. Pradhan (1986) \(^{57}\) in his work on working Capital Management of Nepal Enterprise, used econometric
models to describe the demand for working capital and its various components. In this study, the demand for working capital has been viewed in a way similar to the demand for cash and inventories. The models used in this study are

\[ Y^* = f(W) \quad \text{(I)} \quad \text{Where } W \text{ - Wealth} \]
\[ Y^* = f(W, i_2) \quad \text{(II)} \quad i_2 \text{ - Interest rate} \]
\[ Y^* = f(W, i_2, Cu) \quad \text{(III)} \quad Cu \text{ - Capacity utilization rate} \]

The regression results show that the levels of working capital and its components, an enterprise desires to hold depend not only on sales but on holding costs also. However, the inclusion of capacity utilisation in the models does not seem to have contributed much to the demand functions of working capital and its various components.

From the above, it is clear that the interest in the study of demand for money was aroused by Baumol, Tobin and Friedman. Frazer, Nadiri, Kamta Prasad and Ashok Kumar Lahiri observed economics of scale thereby supporting Baumol and Tobin, while Meltzer, Whalen, De Allessi and Bhole L.M. observed diseconomies of scale thereby supporting Friedman as far as the transaction demand for cash is concerned. Similarly, there is no unanimous finding as regards the effect of capital costs on the demand for cash. Among others, De Allessi and Nadiri showed the statistically significant effect of capital costs on the demand for cash, while Friedman did not find the same.
STUDIES ON THE DEMAND FOR INVENTORIES

There is no controversy as to the fact that target inventory levels are functions of expected sales as indicated by almost all the studies on the demand for inventories by firms. The controversy arises about the cost of capital and other effects on inventory demand. Theoretically, the level of inventories of a firm would depend on the costs associated with holding the inventories.

Newton Robinson (1959)\textsuperscript{58} studied interest rate effect on departmental store inventory holdings, but he did not find any effects of interest rate. M.C. Lovell (1964)\textsuperscript{59} also reported incorrect signs of interest rate co-efficients in his regression explaining deflated durable and non-durable manufacturing inventory levels. Jon Joyce (1973)\textsuperscript{60} in his cross section study found a negative co-efficient for short-term bank interest rate but the results were not statistically significant. Similarly, the two studies by T.C. Liu (1963)\textsuperscript{61} and Paul V. Kuznets (1964)\textsuperscript{62} also reported a negative statistically significant co-efficient on the interest rate.

Liberman (1980)\textsuperscript{63} in his study examined the size and significance of the theoretically important cost of capital effect on inventory investment by utilising firm specific cost of capital measures in a pooled cross-section econometric analysis of inventory behaviour. The study hypothesized that desired
inventories are a function of sales, the opportunity cost of holding inventories, and in the case of goods produced to order, order back logs. The estimated equation was as

\[ \ln I_t = b_0 + b_1 \ln S'_t + b_2 \ln CK_t + b_3 \ln OB_t + U_t \]

Where \( I_t \) was the firms real inventory level in period \( t \), \( S'_t \) was the level of sales, \( CK_t \) was the real cost of capital and \( OB_t \) was the real order backlog. His result showed that cost of capital co-efficients was statistically significant with theoretically correct signs. Similarly, sales co-efficient demonstrated support for economies of scale.

The Irvin Study (1981)\(^{64}\) noticed that the estimated co-efficients on the capital cost measures were not only negatively signed but also they were statistically significant. The Akhtar study (1983)\(^{65}\) also noticed that nominal interest rates had significant effects on the behaviour of inventories.

From the above, it may be seen that effect of capital cost on inventory demand has been a controversial subject. Liu, Kuznets, Liberman, Irvine and Akhtar observed significant effects of capital costs on the demand for Inventories, while Robinson, Lovell, Joyce did not observe the same. Similarly, some reported economies of scale with respect to holding inventories, while others did not report the same.
RECOMMENDATIONS OF WORKING CAPITAL COMMITTEES

In recent years banks have placed several restrictions on the flow of bank credit for working capital requirements to the industries. For this purpose of regulating and control of working capital loans, the RBI has taken several measures. Various committees and study groups were appointed to look into the matter and to suggest measures to regulate and control the liberal flow of bank credit for working capital requirements.

The Dehejia study (1969)\(^66\) group found that in the absence of any restraint on bank credit, industry used to avail of bank credit much more than justified by production performance. The excessive dependence of industry on bank credit for working capital requirements is undesirable and the industry must find alternative means, particularly internal long-term sources for meeting a large portion of working capital. The study group also suggested that this would be possible for correcting the shortcomings of the present lending system of banks by introducing the much needed discipline in credit disbursement and utilization.

To achieve this object the Reserve Bank of India appointed the Tandon committee (1974)\(^67\) to frame guidelines for follow up bank credit for working capital requirements. The committee has suggested norms for inventory and receivables. It
suggested three methods for calculation of permissible bank credit limit for working capital.

I Method: \[ MPBF = 75\% \text{ of } (CA - CL_E) \]

II Method: \[ MPBF = (75\% \text{ OF CA}) - (CL_E) \]

III Method: \[ MPBF = 75\% \text{ of } (CA - CCA) - (CL_E) \]

MPBF - Maximum Permissible Bank Finance, CA - Current Assets. 
CL_E - current liabilities excluding Bank Finance, CCA - Core current Asset.

The methods are based on the principle that the working capital should increasingly be financed by the industries out of their own funds (internal long term sources). This would bring about gradual reduction in bank credit.

Analysis of Tandon Committee suggestions leads to the conclusion that the norms suggested by the committee for holding of inventory levels were not suitable for the textile mills. To solve this problem the Indian Cotton Mills Federation (ICMF) submitted a memorandum which suggested changes in the norms to Reserve Bank of India.

In July 1983, the Reserve Bank of India appointed the Pathak Committee (1983)\(^6\) to examine the need for revision of the inventory norms laid down by the Tandon Committee. The committee has suggested revised norms in respect of composite, spinning and processing mills wherever applicable.
The Chore Committee (1979)\textsuperscript{69} was appointed to review the cash credit system and to examine the prevailing style of bank credit and consider the effectiveness of the monitoring and follow-up system adopted by banks. The committee has suggested that in assessing bank credit limits, banks should follow the second method of lending recommended by the Tandon committee.

The Marathe committee (1983)\textsuperscript{70} was appointed to review the working of cash authorization scheme from the point of view of its operational aspects. The committee has observed that the basic purpose of the Credit Authorization Scheme (CAS) is to ensure orderly credit management and improve the quality of bank lending so that all borrowings are in conformity with the policies and priorities laid down by the Reserve Bank of India.

**APPROACH CHOSEN FOR THE STUDY**

From the above discussion, it is clear that the different authors including economists, financial theorists, management scientists, and practicing business executives have approached working capital management in different ways and at varying levels of analysis. These different approaches to working capital management improved with the emergence of more and more literature on the subject over time. Though there are various approaches, only a few of them can be considered in this study.
The approaches that are included in the study cover assessing the structure and utilisation of working capital, structural determinants of working capital, assessing the financial liquidity position, impact of working capital ratio on profitability, estimating demand for working capital, and isolating inflationary effects on working capital of the selected sugar industries of Tamil Nadu.
REFERENCES


38) Reserve Bank of India study (1988).


