CHAPTER-I

INTRODUCTION AND METHODOLOGY

1.1 INTRODUCTION

The development of the accounting framework started with pressure from the users of financial statements to increase the quality and usefulness of financial reporting. Financial reporting is based on financial standards that may be seen as the means to account for certain business transactions. Each standard is part of Generally Accepted Accounting Principles (GAAP) that serves as the accounting law of a country.\(^1\)

Accounting standards may be defined as authoritative and are generally accepted as practical guidelines. They prescribe the recording and measuring of financial information in the annual financial statements. The aim, therefore, is to enhance the usefulness of reported financial statements for economic decision-making purposes.\(^2\)

In an attempt to establish a foundation upon which financial accounting and reporting standards could be based, the accounting profession identified a set of objectives for financial reporting. These are necessary to provide information that is useful for investment and credit decisions and for assessing cash flow prospects. They also supply information about an entity’s resources, claims to those resources and
changes in those resources. The Financial Accounting Standard Board (FASB) believes that accounting information can be useful in decision-making only if it is relevant, reliable and comparable.

The main criticism against accounting standards is that they were prepared without reference to an acceptable theoretical framework. To lessen this criticism and to maintain the initiative in setting of standards, the accounting profession in the USA initiated intensive research into the development of a conceptual framework.

1.1.1 The development of a conceptual framework in the United States of America

Shortly after its formation in 1973, the FASB began a project to develop a conceptual framework. The goal of FASB was to develop a constitution that will define the nature and function of financial accounting. This project provided a framework for the various accounting concepts and principles that are used to prepare financial statements.

The FASB described its purpose for the conceptual framework project as the establishment of a coherent system of interrelated objectives and concepts that are expected to lead to consistent financial accounting and reporting. These concepts are expected to guide the selection of events to be accounted for, the measurement of those events as well as the means of their
summarisation and their communication to interested users. The conceptual framework should enable investors, creditors and others to obtain increased understanding of and confidence in financial reporting. A conceptual framework developed on these objectives would help narrow the range of acceptable accounting methods as well as promote increased comparability of financial information\textsuperscript{7}.

A conceptual framework would, firstly, be useful for standard setting that would build on and relate to an established body of concepts and objectives. The result would be a coherent set of standards and rules because they shared the same foundation. The framework should increase financial statement users’ understanding and confidence in financial reporting, and it should enhance comparability among different financial statements. Secondly, new and emerging practical problems should be more quickly solvable by referring to an existing framework of basic theory.

The FASB believes that without conceptual underpinnings, measures provided by accounting and financial reporting are essentially matters of judgement and personal opinion. Therefore, more precise definitions in the framework are expected to narrow subjectivity, circumscribe the areas for applying judgements and provide a frame of reference for those judgements\textsuperscript{8}. 

\textsuperscript{7}FASB (1985).

\textsuperscript{8}Ibid.
In 1976, the FASB issued a three-part discussion memorandum entitled Conceptual Framework for Financial Accounting and Reporting: Elements of Financial Statements and Their Measurement. It set forth the major issues to be addressed in establishing a conceptual framework that would be the basis for setting accounting standards and for resolving financial reporting controversies. Since the publication of the document, the FASB has issued numerous statements of financial accounting concepts in its project to develop a framework for financial reporting.

Although the concepts were issued individually, they form a coherent system of interrelated objectives and concepts and are, therefore, used collectively in financial reporting. Most entities recognise the need for more uniform standards between countries as the objectives of financial reporting in one country may often differ from those in other countries. In addition the institutional structures between countries are often not comparable and strong national tendencies are pervasive. Therefore, several organisations are working to achieve worldwide harmony in accounting standards. Chief among these organisations is the International Accounting Standards Committee (IASC). Since its creation in 1973, the same year as the formation of the FASB, the IASC has had the support of the accounting professions in the United States, most of the British Commonwealth
countries, Japan, France, Germany, the Netherlands and Mexico. As the IASC has no authority to require compliance with its accounting standards, it must rely on the cooperation of the various national accounting professions. However, since its formation, the IASC has succeeded in narrowing certain differences in international accounting standards\textsuperscript{11}.

Since the early 90’s, the accounting profession has experienced considerable pressure to increase the usefulness of accounting reporting. Accounting standards were criticized because they were prepared without reference to an acceptable theoretical framework. Therefore, the Financial Accounting Standards Board (FASB) in the USA involved in a project to develop standards in order to contribute towards the development of an accounting framework for financial accounting and reporting. The very first publication was launched in the USA in 1973 and resulted in the development of a conceptual framework. In July 1989, the International Accounting Standards Committee (IASC) issued a document entitled, ‘Framework for the Preparation and Presentation of Financial Statements’.
1.1.2 The objectives of the accounting framework

Opperman et al. have identified some of the objectives to be achieved by the accounting framework:\(^\text{12}\):

- to support the development of future international accounting standards.
- to provide a basis for reducing the number of alternative accounting practices.
- to assist national accounting standard setting bodies in developing national standards.
- to assist the compilers of annual financial statements in dealing with that have yet to form the subject of an international accounting standard.
- to assist auditors in forming an opinion as to whether financial statements conform to GAAP of the IASC.
- to assist users of financial statements to interpret the information reported therein.
- to provide parties with information about the approach of the IASC to the formulation of international accounting standards.
1.1.3 The objectives of financial statements

The main objective of financial statements is to provide information about the financial position (balance sheet), performance (income statement) and changes in financial position (cash flow statement) of an entity that is useful to a wide range of users in making economic decisions

The users of financial statements are, *inter alia*, interested in the ability of an entity to generate cash and cash equivalents and the need to utilise these cash flows. Accordingly, a cash flow statement must be presented as an integral part of a financial statement.

The financial position of an entity will be affected by the control exercised over its economic resources, financial structure, liquidity and solvency, and capacity to adapt to the changes in its business environment. Information on the performance or profitability of an entity is required to evaluate changes in the economic resources that are likely to control the future. Information regarding the changes in the financial position of an entity is useful in evaluating the investing, financing and operating activities during a reporting period.
1.1.4 Underlying assumptions of financial statements

When preparing financial statements, two broad basic assumptions have to be dealt with, namely, the accrual basis and the going concern concept. With the accrual basis, the assumption is that the effect of transactions and other events must be recognised when they occur. They must be recorded and reported on in the accounting periods and financial statements to which they relate. The going-concern concept, on the other hand, assumes that the entity will continue to be in operational existence for the foreseeable future.

1.1.5 Qualitative characteristics of financial statements

Qualitative characteristics are the attributes that make the information in the financial statement useful to users. The four qualitative characteristics are understandability, relevance, reliability and comparability.

The information provided in financial statements should be readily understood by the users. It is also assumed that the users have a reasonable knowledge of business, economic and accounting activities as well as a willingness to study the information with reasonable diligence.

Information is of relevance when it influences the economic decisions of the users by helping them to evaluate the past, present and future events, or confirm, or correct their past evaluations. The relevance of information is
also affected by its nature and materiality. For information to be material, its omission or misstatement could be seen to influence the economic decisions of financial statement users. For information to be regarded as reliable, it has to be free from material errors and bias; and users can rely on it representing what is reasonably expected. The reliability of information is influenced by the following considerations:

- Faithful representation;
- Substance over form;
- Neutrality;
- Prudence; and
- Completeness.

The financial statements of an entity must be comparable over time in order to identify trends in its financial position and performance. The comparability of financial statements may be enhanced by the:

- Consistency of an accounting treatment of similar / like transactions and other events;
- Disclosure of accounting policies applied by an entity;
- Disclosure of changes in accounting policies and their effect; and
- Presentation of comparative figures of the preceding periods.
Constraints may be found in the relevance and reliability of information. These are identified as:

- Timeliness of information;
- Balance between benefit and the cost of information supplied; and
- Trade-off between qualitative characteristics of information. If this occurs, the main objective of financial statements should be maintained.

Financial statements are described as presenting a true and fair view of, or as presenting fairly, the financial position, performance and changes in financial position of an entity. Such financial statements are the results of the application of principal qualitative characteristics and of appropriate accounting standards.

1.1.6 **Elements of financial statements**

Financial statements describe the financial effects of transactions and other events by grouping them into broad classes according to their economic characteristics. These classes are referred to as the elements of financial statements. The elements, which are directly related to the measurement of a financial position, are according to Opperman et al.:
• Assets, that are resources controlled by the enterprise as a result of past events and from which future economic benefits are expected to flow to the entity;
• Liabilities, which represent the obligations of an entity arising from past events, the settlement of which is expected to result in an outflow of resources from the entity; and
• Equity, which is the net interest in the assets of an entity after deduction of all liabilities.

The elements that are directly related to the measurements of profitability of an entity are:

• Income, which is the increase in economic benefits during an accounting period in the form of an inflow of assets, or a decrease of liabilities that result in an increase in equity, except contributions from owners.
• Expenses, which are decreases in economic benefits during an accounting period in the form of outflow of assets, or increases in liabilities that result in decreases in equity, other than distributions to owners.

The revaluation or restatement of assets and liabilities that give rise to an increase or decrease in equity meet the definition of income and
expenses. However, they are not included in the income statement under capital maintenance but in the balance sheet as reserves.

1.1.7 Inclusion of Cash flow statement as an element of financial statements in India

The Institute of Chartered Accountants of India (ICAI) issued an Accounting Standard AS-3 on the subject titled ‘Cash flow Statement’ in April 1997. This has replaced earlier AS-3 on ‘Statement of Changes in Financial Position’. However, the standard has been made mandatory with effect from 1st April 2001 in India in respect of (i) Companies whose shares or debentures are listed in a recognised stock exchange in India and the Companies which are in the process of issuing shares or debentures that will be listed in a recognised stock exchange in India and (ii) All other commercial, industrial and business enterprises whose turnover for the accounting period exceeds Rs. 50 crore. AS – 3 (revised) requires that cash flow statement should be presented in a manner that highlights all major categories of cash flows. It has classified cash flows into three categories namely, (1) Cash flow from Operating Activities (2) Cash flow from Investing Activities and (3) Cash flow from Financing Activities.

Cash flow ratios that could be derived from cash flow data have the potential to increase the usefulness of the Cash flow statement (AS-3) and Financial Reporting. The Cash flow statement can determine the ability of
business operations to generate future cash flows, meet out obligations from internally generated funds and also indicate reliance on outside financing. Cash flow ratios can also be used to predict financial failure.

Traditionally, however financial ratios were used for financial analysis. These ratios were categorised to measure liquidity, asset and debt management and profitability. With the inclusion of the statement of Cash flows in financial reporting, new and more useful information has become available for inclusion in a financial analysis.

1.1.8 Corporate Distress / Financial Distress

At the end of the twentieth century, corporate distress reached the levels not seen since the great depression of 1930. The number of business failures and bankruptcies increased together with the increase in corporate distress. Four generic terms that are generally found in literature for corporate distress are failure, insolvency, default and bankruptcy.

- **Corporate Failure** means that the realised rate of return on invested capital, with allowances for risk consideration, is significantly and continually lower than prevailing rates on similar investments. Somewhat different criteria has also been utilized, including insufficient revenues to cover costs and cases of the average return on investment being below the company’s cost of capital. A company
could be in an economic failure for many years without failing to cover its current obligations because of the absence of legally enforceable debt.

- **Insolvency** is a term used in a more technical way. It indicates lack of liquidity, so it is more cash based, which happens when a company cannot meet its financial obligations. Technical insolvency most often is the cause of formal bankruptcy declaration.

- **Bankruptcy** comes along when the insolvency of a company becomes critical and when the total liabilities of a company exceed a fair value valuation, for example stock based, of its total assets.

- **Corporate Default** is another condition that is inescapably associated with distress. Defaults always occur between the debtor company and a creditor class. A company is not always immediately in default when it misses a loan payment or its interest payments. However, when a company misses interest payments or principal repayments of publicly held bonds, and this problem is not fixed within 30 days, the security is immediately “in default”. In the last few decades, these defaults on publicly held indebtedness have become a common event.
Generally, a company can go bankrupt when the total liabilities exceed a fair value of the total assets of that company. On the other hand, in USA, a company can be declared bankrupt by a Federal District Court. The Federal District Court can declare the company bankrupt immediately or offer the company to participate to a recovery program, which is called “bankruptcy reorganization”. When a company’s value is worth more than its liquidation value, such a company has to participate in a recovery programme. The company’s creditors and the shareholders of the company are the two primary groups of interest when a company is in corporate distress. These two groups have an extremely large importance in the evaluation of the bankruptcy reorganization process. The goal of the reorganization process is to restructure the company in a way that the company’s financial situation will stabilize and that no other financial problems will occur in the near future. Similar process of reorganization of companies exists in India too.

1.1.8.1 ‘Corporate Failure’- Definition

The most common definition of corporate failure used in prior accounting research is filing for bankruptcy (Kuruppu et al., 2003). Corporate failure or financial distress occurs when asset values shrink below the level of liabilities and / or when a company can no longer obtain
sufficient cash to meet payments as they fall due. It is also believed that the inconsistency may be caused by external factors such as, economic conditions, business costs, and new business formations which affect the consistency between the ratios and the actual status of the company. Corporate insolvency is either by fall in the asset value or due to liquidity shortage. Corporate failure includes large losses disproportionate to assets, stock exchange delisting, and companies in the process of liquidation or receivership, failure to pay annual listing fees, negative stock returns, and the receipt of a going-concern qualification. It is identified that the presence of company-specific factors like, the size and industry of a company may have different acceptable levels of financial ratios. Other specific factors of companies include profitability and funds flow, financial leverage and interest, liquidity, market to assets ratio, and market value and size of the company. The usual sign that points to the weakening of a company is its problem with cash flow. These problems can be attributed to certain causes, such as the presence of the right people in the right places, and management’s misalignment with philosophy and goals of organizations. Therefore, it is expected that the ratios that reflect cash flow structure and movement of market value of company’s assets are going to be different among defaulted and solvent companies. Surprisingly, good ratios for a
failing company may stem from the so-called creative accounting caused by various management incentives to manipulate accounting data in order to improve economic figures in a failing company. Bankruptcy prediction is the art of predicting bankruptcy and various measures of financial distress of companies. It is used to indicate a condition when promises, made to the creditors of a company are broken or honored with difficulty.

1.1.8.2 Importance of corporate distress prediction

When a company is in corporate/financial distress, there are two primary groups of interest namely, the lenders and the contributors whose interest would be at stake, but besides these two groups, bankruptcy prediction is also of importance to bond holders, and to a lot of other major players in the financial and legal services markets. The reasons of importance to the owners and the creditors are easy to imagine. For the bond holders, the default risk of a bond is an important factor influencing the value of a bond. When a company or government, who has issued a bond, is not capable of meeting the financial obligations that come along with the bond, it is assumed that the issuer has ‘defaulted’ on the bond. So it is of great importance for the bond holder to know about the possibility of failure of the issuer of the bond. For legal and accounting companies, bankruptcies are big business. Particularly, the bankruptcy reorganisation processes are
extremely profitable for these business entities. Besides them, bankruptcy courts are extremely busy handling all new or current bankruptcies. The bankruptcy prediction problem can be seen a classification problem. Investors, auditors, and other individuals, who like to evaluate the risk of an investment, want to know if the company they are looking at is going to be bankrupt in the near future with a certain probability. The input of the classification problem can be modeled as a vector of financial and/or strategic ratios. Given this vector, a classification technique has to be able to assign one of the two possible outputs to the company; they are bankrupt or not bankrupt.

1.1.8.3 Causes of corporate distress and bankruptcy

It is important to identify the main reasons for corporate distress with bankruptcies as a consequence. Several studies about this subject have been done over the past decades. An example of these studies was done by a consulting firm, Buccino & Associates\textsuperscript{20} (1991). They surveyed over 1,300 managers, and the result pointed out that, by 88\% of the respondents, the quality of management was identified as the primary difference in success or failure. Dun and Bradstreet\textsuperscript{21} (1980) identified earlier that lack of experience, unbalanced experience, or just plain incompetence was the cause of company failures in more than 44\% of the situations.
Another important issue to take into account is the relation between the age of a company and the possibility to fail. Dun and Bradstreet\textsuperscript{22} (1980) showed that over 50\% of all failures occur with companies with ages between two and five. After the age of five, companies tend to be more stabilized, experienced, established and as an indirect result of these reasons, they have better access to capital. Other, mainly financial reasons for the failure of companies which had the upper hand during the 80s are the following:

- **Industries**- Some industries tend to be “sick”. Companies which are active in these industries have a high possibility to fail in the near future.

- **Interest rates**- Because of high interest rates, some companies fall into the position in which they cannot obey to their obligations anymore.

- **Competition International** – International competition intensifies the charges for companies enormously.

Debt to equity Companies enjoy leverage. But, presence of debt in the capital employed of a company puts itself in a situation of more financial obligations. In times of corporate distress, these persisting obligations could lead to failure, deregulating of key industries leads to a far more competitive environment; Formation rates- High new business formation rates will cause
higher frequency of failure of companies. In general, new companies have a higher probability of failure than established companies.

All the aforementioned reasons and probably even much more reasons contribute to the chance of failure of a company. The focus of the study is primarily on the financial causes of failure of companies, mainly because of the fact that these causes are more quantifiable.

1.1.9 Usefulness of Cash flow statement

Now a day, the cash flow statement is accepted as a necessary component of complete financial reporting by the setters of national and international accounting standard; because financial statement users note that the balance sheet, income statement and retained earnings statement do not always show the whole financial condition of a company.\(^2^3\) The balance sheets show the variety of assets owned by a company and the manner in which they were financed at the end of period but the source of activity related to those items during the period are not provided. Also profit in the income statement does not reflect an increase in cash. Moreover, the profitability and financing issues are reported separately on income statements and balance sheets respectively. This causes misleading and confusing results to users.\(^2^4\).
The requirements of cash flow statements are based on the assumption that past cash flows are useful for assessing future cash flows and the cash flow statement supplements and presents information differently to the information provided in other financial statements. Accounting standard setters claimed that the cash flow statement used in conjunction with other financial statements, the balance sheet and income statement, provides the following perceived benefits:

- It presents an insight into the changes in net assets of a company.
- It shows the ability of a company to generate cash and cash equivalents.
- It can be used in developing models to assess and compare the present value of the future cash flows of different companies.
- It also enhances the comparability of the reporting of operating performance by different enterprises because it eliminates the effects of using different accounting policies in accrual accounting for the same transaction and events.
- It is usually used as a sign of the amount, timing and certainty of future cash flow.
- It is also useful in checking the accuracy of past assessments of future cash flows and in examining the relationship between
profitability and net cash flow and the impact of changing prices”

Cash flows are advocated as very useful information for investors and creditors. Many advocates argued that the main benefit of cash flows to users is that the information overcomes many limitations associated with accrual accounting measurement procedures, manifested in traditional financial statements. In addition, because cash flows represent the most objective measure of capacity to consume and command resources and cash portrays the best measure of liquidity, they are not contaminated by measurement problems, and facilitate the prediction of future dividends and credit and loan payments.

1.1.10 Usefulness of cash flow information

The prediction of financial distress is one of the suggested uses of the cash flow statement, although users may have different uses for the cash flow statement. Shareholders will use the cash flow statement as it records the changes in the other statements and focuses on what shareholders really care about: the cash available for operations and investments. Investors are interested in the dividends they will receive and the market value of their investments. They are, therefore, more interested in the cash flow than in the earnings of their investment.
Small businesses often prepare a business plan in order to obtain financing for expansions. A business plan has multiple uses and, according to Crawford-Lucas\textsuperscript{30}, the cash flow statement can be the life and breadth of a business plan. It will inform an entrepreneur where the cash will come from. Durham\textsuperscript{31} indicates that the cash flow statement is one of the most important tools for planning future expenditures of non-profitable entities.

Clark\textsuperscript{32} agrees with Guira\textsuperscript{33} that the cash flow must be computed monthly. It is the lifeblood of an entity and by monitoring the cash flow, an entity’s future growth will be guided more effectively and revenue problems may be prevented. Scott\textsuperscript{34} points out that the income statement is not a predictor of an entity’s cash situation but the cash flow statement shows what is happening with cash flow.

Cash flow on hand is the measure by which real estate investments are valued. When asset conditions change and more in-depth analysis is needed, cash flow results are more revealing since it is important to know where the cash flows are coming from and where they are being spent or distributed\textsuperscript{35}.

The statement of cash flows can be especially useful for financial analysis because cash items are separately identified and classified with respect to activities (operating, financing and investing). In addition, ratios derived from the cash flow statement can provide information useful for
performance evaluation. Ratios can be computed and used to measure liquidity, asset and debt management, profitability and performance.

Giacomino and Mielke 36 point out that most cash flow studies show the value of cash flow data in predicting bankruptcy and financial distress of companies. Havel and Levine37 state that an entity will not go out of business because it reports net losses, but because it runs out of cash. Ozanian & Badenhausen38 believe that it is possible for an entity to report impressive earnings and yet be bleeding cash.

The ability to generate cash flow and future cash flow is, therefore, critical for the financial success of an entity. If an entity can generate sufficient cash out of internally generated funds to cover its current debt, pay interest and dividends and reinvest in assets, it should be able to survive. Cash flow from investing and financing activities can also be used to pay the obligations, but operating activities are the primary source of an entity’s funds. If an entity can cover all obligations, reinvest in assets and pay dividends out of internally generated funds, it indicates a financially healthy entity.
1.1.11  **Power of cash flow ratios**

Since its proposal, the cash flow statement has been greatly supported. The cash flow statement is useful for financial reporting as it reveals information about the ability to generate future cash flows. The inclusion of the cash flow statement in financial statements revealed the need to develop cash flow ratios for analysing the cash flow statement.

When it comes to liquidity analysis, cash flow information is more reliable than balance sheet data or income statement information. Balance sheet data are static measuring a single point in time – while the income statement contains many arbitrary non cash allocation. In contrast, the cash flow statement records the changes in the other statements and nets out the book keeping artifice, focusing on cash available for operations that is what the share holders really care for. The financial statement users have argued in favor of the disclosure of detailed information on an entity’s current operating cash flows. Therefore, the cash flow statement was designed to bridge the information gap between traditional accrual accounting and an understanding of the cash flow activities of an entity. A gap existed because accrual accounting failed to provide relevant disclosure to assess the amount, timing and uncertainty of future cash flows. Such disclosures would allow users to better assess the ability of an entity to
generate positive future net cash flows, to meet obligations and to assess the need for external financing. It should also assist users of financial statements in their assessment of liquidity, viability and financial adaptability.

An analysis of the cash flow statement will indicate the accuracy of past assessment of future cash flows and the relationship between profitability and net cash flow. The greater the amount of future net cash inflows from operations, the greater the ability of an entity to withstand adverse changes in operating conditions. A cash flow statement highlights the liquidity and the management of working capital of an entity and enables users to be better informed about the performance of management.

1.2 STATEMENT OF THE PROBLEM

Analysts have been using financial ratios for a financial analysis and also to predict the financial variables of an entity. These ratios are grouped into liquidity, profitability, turnover and solvency categories. The net working capital, current and quick ratios are used to evaluate the liquidity of an entity but many researchers and authors agree that these ratios are not enough for liquidity prediction. Financial distress will result when obligations can not be met because of poor state of liquidity and there is no
access to additional financing. Current and quick ratios can be positive and profits can increase, while at the same time, an entity can be in severe financial distress. Within the financial analysis of an entity, the cash flow information can be more reliable than the information derived from the balance sheet and income statement. The balance sheet information is static since it measures a single point in time that is the date of balance sheet. The income statement on the other hand, contains many non-cash transactions also. But, cash flow statement is dynamic. It records the changes in the other statements over a period and focuses on the cash available from as well as for the operations and further investments. A set of cash flow ratios used in conjunction with the traditional balance sheet and income statement ratios could be of increased value to evaluate the financial strengths and weaknesses of an entity. Many researchers and authors in other countries have emphasised the importance of including cash flow ratios that are derived from the cash flow data in the financial analysis of companies, apparently to protect the interest of different stakeholders associated with the business entities. However, to date, there is no consensus on a comprehensive set of cash flow ratios for the evaluation of the cash flow statement.
In India, the application of financial ratios to evaluate the financial state of an entity and the prediction of financial distress, if any have been done widely in relation to various industries. However, the research on the application of cash flow ratios as indicators of financial distress of business entities is perceived to be new. It is the primary reason of this study to identify and apply a set of cash flow ratios computed using cash flow data that would facilitate early identification and prevention of financial distress with reference to Indian private sector manufacturing companies. This study also makes a comparative analysis between the predictive ability of financial ratios and cash flow ratios towards the financial distress of companies.

1.3 SIGNIFICANCE OF THE STUDY

The manufacturing segment is considered to be the largest industry which has many companies registered to its credit in India. The manufacturing industry is a key segment for the Indian economical, social, capital market and other developments. The manufacturing industry paves way to future technological innovations and discoveries that impact all other areas of the society. Manufacturing industry in India captures the major portion of the population as it has generated more employment opportunities. It continues to dominate the other Indian industries for the past few decades in terms of productivity, employability, consumption and
turnover. The greater financial gains and losses of the past decades are directly related to the manufacturing industry. Out of 22,583 companies that are registered and listed in the industries list of the database “Prowess” as of the year 2008-09, 10,385 companies are manufacturing companies.

The audit report of a company generally reveals the extent to which the company has incurred accumulated and cash loss for consecutive years. The study of the financial distress of manufacturing companies permits to investigate the risk factors impacting the manufacturing industry and at the same time provides valuable tool for banks, auditors, creditors, investors and managers in assessing the “going concern” of a company in the same industry. Understanding the financial distress position of the Indian manufacturing industry enables to identify and determine the warning signals of the financial distress in manufacturing industry. The purpose of this study is to construct models using financial and cash flow ratios for the prediction of financial distress among Indian private sector manufacturing companies. The study applies a particular default prediction model namely, the Z score model of Altman to 33 paired samples of non-distressed and distressed manufacturing companies. The study is for the time period of 2003-04 to 2007-08, in which 2007-08 is the indicator year of default.
The aim of the present study is to determine if cash flow ratios could complement information already provided by accrual accounting and be effectively used to predict financial distress. It is the intention of the study to show that how the cash flow ratios, constructed integrating the cash flow data with accrual accounting data could provide a superior measure over accrual accounting data alone for predicting the business failure.

The principal objective of cash flow statement is to assist the users of financial statements to determine the ability of an entity to generate future cash flows, meet obligations, pay dividends and rely on internal and external financing. As there is no consensus on a comprehensive set of cash flow ratios for analyzing the cash flow statement, this study investigates the cash flow ratios suggested by different authors. A set of cash flow ratios shall be identified from the past studies to serve the objectives of the cash flow statement and the same will be suggested to be included in financial analysis of business entities. The present study becomes more relevant and accurate as financial information derived from cash flow statement will help better to identify the companies’ failure or progress of companies.
1.4 OBJECTIVES OF THE STUDY

This study has master minded with the following objectives:-

Ø To examine the cash flow ratios suggested by different authors in their past studies.

Ø To evaluate whether financial ratios have the ability to predict financial distress of companies.

Ø To evaluate whether cash flow ratios have the ability to predict financial distress of companies.

Ø To determine whether cash flow ratios are better predictors of financial distress of companies than financial ratios.

Ø To suggest financial distress prediction models of financial and cash flow ratios to be included in the financial analysis on companies.

1.5 METHODOLOGY

1.5.1 Data used

This study is based on secondary data. It is a descriptive research. The additional resources such as textbooks, financial accounting standards and accounting journals have been used for studying cash flow standards, the cash flow statement, ratios and the needs of the users of financial statements.
The core resources used are the financial statements of listed companies. There is a software package named “Prowess” developed and maintained by “Center for Monitoring Indian Economy Pvt Ltd,” Shortly known as CMIE which provides a detailed list of information about the listed companies from the available source. “Prowess” contains the financial statements that include cash flow statement data of listed companies that are related to the industries, classified under various heads, such as public, private and foreign owned corporations. The study includes non-financial privately owned companies, but excludes companies of non corporate form, publicly owned corporations and non industrial companies (public utilities, transport companies and financial institutions). Referring the database, the available paired samples of non-distressed and distressed companies belonging to the Indian private sector manufacturing industries that fulfill the set criteria of asset size and industry, have been chosen in this study. The sampling technique, used in the study is Survey Sampling. The asset size of the company varies to be large in privately held corporations. Therefore, the study takes in to account small and medium Companies, where the probability of failure is more than in large companies. The study has evidence over its statement as large companies are established and financially strong in spite of challenges, but small and medium companies
once hit the financial crisis find themselves difficult to restart. Strictly analyzing, the influences drawn from this study apply only to companies that are registered, listed and has registered number in CMIE database. The similarity of asset size is more among small and medium companies than large companies.

1.5.1.1 Selection of failed (or) financially distressed and non –failed (or) financially non- distressed companies

The identification (classification) of the failed companies according to industry and their asset size is an essential pre-requisite for the selection of the non-failed companies. The selection process of the companies was based upon a paired – sample design that is for each failed company in the sample, a non failed company of the same industry and with the same asset size was selected. The failed companies of the same industry that have been included in the study were obtained from the list of identification, based on the following aspects:–.

Where the auditor’s report specifies that:–

- The company has incurred accumulated and cash loss for the current as well as the previous years.
- The company is stated as not a going concern.
The company has not paid its financial obligation to its borrowers or the bank.

The bank disclosure of the company provides information of its borrowings from banks and non-repayment of obligations during the current period or the series of period.

The company has not paid the dividends for the last five years.

The company should be a listed company in any one of the stock exchanges and has the listing criterion.

Among the many features, related to the CMIE’s software named ‘Prowess’, few that are convenient for the study, have been considered and the same are listed as follows:

(i) The industries are classified under main and sub categories

(ii) The industrial sub-classification has number of companies giving detailed information about their industry

(iii) Within each industry group, the failed and non-failed entities with similar asset size have been considered for analysis.

(iv) The companies should have followed the standard and prescribed financial statement format for each financial year and the mandatory cash flow statement as per Indian Accounting Standard (AS-3) that
came into force from the accounting year 2001-2002 which is the major criteria.

The companies which do not fulfill the above said criteria do not become part of the population sample selected for the study.

*The following procedure was used to select the failed and the non – failed companies:-*

(i) The classifications of the industries that have progressed and had the highest fluctuations in the market are considered.

(ii) Identifying their asset size, their failure, the bank disclosure and their listed evidence.

(iii) Within the industry group, tentatively select a pair of failed and non-failed companies whose asset size is the same to one another.

(iv) If it is not possible to find a pair as per previous point, return back to the list and tentatively select the non-failed company which is next in the list, but closest to the asset size of the failed one.

The paired –sample design was selected in the study to help provide a “control” over factors that otherwise might blur the relationship between ratios and failure. As early as 1923, the ratios literature suggested that industry factors must be incorporated in any complete ratio analysis. The literature contends that “differences” exist among industries that prevent the
direct comparison of companies from different industries. Another way of stating this argument is that the same numerical value of a ratio implies a different meaning or probability of failure in different industries. The evidence offered on behalf of industry differences is the fact that the ratio distribution differ among industries.

The earlier researches have paid less attention towards the asset size of the company. Moreover, there are certain statistical reasons for believing that asset size alters the relationship between ratios and failure. Asset size of the company for the study is the total assets of the company at the end of a financial year.

In order to accept the failed and non-failed companies from the database based on the asset size, the following conditions are to be met:-

(I) The asset size of the failed and the non-failed companies should be in closet value or digits as of the year ended on 31st March 2004.

(II) Imperfect pairing is difficult to assess and conclusions cannot be drawn.

(III) Larger companies with same asset size that are more solvent are not considered.

(IV) Companies of the same industry and the same asset size are considered for the study.
(V) Each failed company has a non failed mate in the sample.

(VI) To make the study relevant, the comparison of the failed and non failed companies has to be meaningful and the sample of non- failed company should be drawn from the sample population as that of the failed company.

Based on the parameter for selection, initial sample composed of 66 companies with 33 in each of the two groups. Group A is composed of 33 financially distressed companies that are identified as not a going concern and sick companies, having accumulated losses or cash loss as per the audit report. The financially distressed companies need to have the financial statements before default prediction is to be made. Group B is composed of 33 non-distressed companies that were in existence at the time when the companies in Group A became default. Each of the companies in the group-B has been selected in such a manner that they would match its corresponding distressed company in Group A in terms of the industry as well as the total asset size. Therefore, Group B is the non-distressed mirror image of Group A. The mean asset size of the companies in Group B was slightly greater than that of Group A. The difference is not significant to the development of the model and does not affect the similarity between the companies. Moreover, finding the exact asset size is impractical for
financially distressed companies. The data of the 33 distressed companies were obtained for a period of five years that include the time period of their distressed position. Following the same methodology, financial statements for the non-distressed companies were considered. Every financially distressed mate has a financially non-distressed mate.

1.5.1.2 Collection of financial and cash flow data

Financial and cash flow data of distressed and non distressed companies were obtained from ‘Prowess’ of CMIE for 5 years that include 4 years prior to financial distress and the 5th year that is the year of financial distress. Only companies which had full data as well as uniform / standardised financial and cash flow statements have been considered for the study. The “first year before failure” is defined as the year that relates to the most recent financial statement prior to the date, the company failed. The second year before failure is the fiscal year preceding the first year. The third and fourth years are similarly defined. The financial statement data of the non-failed companies were obtained for the same fiscal years as those of the failed mates. Many companies could not become part of this analysis because of the non submission of report or data to CMIE. Availability of data over the 5 year period was made a criterion for inclusion in the sample.
1.5.2 Statistical Instruments Used

After careful consideration of the nature of the problem and of the purpose of the study, Multiple Discriminant Analysis (MDA) was chosen as the appropriate statistical technique for measurement. Multiple Discriminant Analysis (MDA) is used to identify that among the chosen ratios which ratios contribute the most to predict the financial distress of an entity. It is used primarily to classify or make predictions in problems where the grouping variable appears in qualitative form that is distressed and non-distressed companies. Therefore, the first step is to establish explicit group classification. The original groups are only two, distressed companies are given the range zero as the dummy value and non-distressed companies are given a range of one.

After the groups are established, data are collected for the Objects (ratio) in the groups. MDA then attempts to derive a linear combination of these characteristics which best discriminates between the groups. If a ratio is quantified for all the companies in the analysis, MDA determines a set of discriminant coefficient. When these coefficients are applied to the actual ratios, a basis for classification into one of the mutually exclusive grouping exists.
The study consists of two groups in the order of distressed companies on the one hand and of the non-distressed companies on the other hand. Therefore, the analysis is transformed into its simplest form.

The discriminant function of the form:

\[ Z = V_1X_1 + V_2X_2 + V_3X_3 + \ldots + V_nX_n \]

It transforms the individual variable value which is then used to classify the object.

Where \( V_1, V_2 \ldots V_n \) = Discriminant coefficient means the discriminant score identified statistically for the ratios that have the significant level as 0.000.

\( X_1, X_2 \ldots X_n \) = Independent variables are those which are considered as ratios for the study.

\( Z \) = the overall index or the score. The overall index or the score represents the present condition of the company that is whether the company is in distressed or non-distressed state.

\( Y_0, Y_1 \) = Grouping Variable (ranges between 0, 1 for the study). It is the qualitative data that is transformed into quantitative data. They are distressed and non-distressed companies.

The MDA computes the discriminant coefficient, \( V_j \) while the independent variables are actual values, that is the ratio. Where, \( j = 1, 2 \ldots n \)
Independent Variable - The independent variables, considered in the study are the ratios that are predictors of distress of companies.

Grouping Variable – Two categories of companies such as, distressed and non – distressed are taken for the study. Distressed company is identified as 0 and the non – distressed company is identified as 1.

Original Sample- The analysis is initially performed on a single subset.

Cross Validation of sample has been done to analyze the other subsets that are retained for subsequent use in conforming and validating the initial sample.

When utilizing a comprehensive list of cash flow ratios and financial ratios in assessing a company’s distress potential, there is a reason to believe that some of the measurement will have a high degree of correlation with each other. It is because the correlation itself is the association of the relationship between two variables. If these two variables contribute more towards financial distress, they will have negative relationship or else, they will have positive relationship. The closer they are towards distress; they are likely to have more negative relationship. They have positive relationship when they are more far from the distressed situation.

MDA approach to ratio analysis has the potential to reformulate the problems correctly. Specifically, combination of ratios can be analysed
together in order to remove possible ambiguities and misclassifications, observed in earlier traditional studies. In this study, MDA helps to identify the ratios (variables) for analysis, when the companies face financially distressed situation.

While the aspect necessitates careful selection of the predictive variables (ratios), it also has the advantage of yielding a model with a relatively small number of selected measurements which has the potential of conveying a great deal of information. This information might very well indicate differences between groups but whether or not these differences are significant and meaningful is a more important aspect of the analysis. Definitely, there are differences between financially distressed companies and financially non-distressed companies; but are these differences of a magnitude to facilitate the development of an accurate prediction model? Perhaps, the primary advantage of MDA is that in dealing with classification problems, it has the potential for analysing the entire variables’ profile of the object simultaneously rather than sequentially examining its individual characteristics.
1.5.3 Steps involved in the Model Development

Four key parameters constitute the basic characteristics of sample data which are explained below.

1.5.3.1 The first parameter is the identification of industry and industry classification that has become part of the study. Manufacturing industry accounts for a significant share of industrial sector in India. Manufacturing Companies have borrowed loans from banks and owe a lot to banks. Manufacturing industry is an employment generator and it is the same that is considered for the study.

Table 1.1 – Sampling Framework- Industry wise

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Industry</th>
<th>Distressed</th>
<th>Non-Distressed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cotton and Blend Yarn</td>
<td>5</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>Pharmaceuticals</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Plastic Tubes</td>
<td>10</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Steel</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Machine Tools</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>Other Electronics</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>33</strong></td>
<td><strong>33</strong></td>
<td><strong>66</strong></td>
</tr>
</tbody>
</table>
1.5.3.2 The second parameter is identification of the time force. The study analyzes financial information related to the period from 2003-04 to 2007-08 for following three reasons:-

First, the manufacturing industry is a relatively established old sector and the financial information can easily be accessed; Secondly, in order for financial comparison across companies to be less biased, the external factors should be constant over the research period. Shirata et al. 2003\textsuperscript{40} conclude that “under different economic circumstances, discrimination using the same discriminant is difficult to implement”. From an economic perspective, the 2003 to 2008 time frame is a period of crises during which industries faced recession; lastly, the chosen period is extremely favorable for distressed companies in terms of availability of data. Since preparation and presentation of cash flow statement became mandatory in India only from the year 2001-2002, the cash flow statement of listed companies are made available only from the financial year 2001-2002. During the year 2008, many companies have faced financial distress which helps the prediction in a better way.

1.5.3.3 The third parameter is the size of the companies involved in the analysis. Large companies with more asset size face less failure than small and medium companies with less asset size. This is very identical in
the case of recession that made the survival of small and medium companies difficult. Therefore the study considers the small asset size companies than that of the large asset size.

Table -1.2 – Sampling Framework- Asset size

<table>
<thead>
<tr>
<th>Asset Size (in crore of INR)</th>
<th>Distressed</th>
<th>Non Distressed</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td>23</td>
<td>23</td>
<td>46</td>
</tr>
<tr>
<td>25-50</td>
<td>6</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>50-75</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>75-100</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td><strong>33</strong></td>
<td><strong>33</strong></td>
<td><strong>66</strong></td>
</tr>
</tbody>
</table>

1.5.3.4 The last parameter for the study is to determine which financial statement to be considered for the study. Many past studies have taken two years before the bankruptcy, but the present study undertakes 4 years prior to financial distress with uniformity of financial information, to be the most predictive source of information.
1.5.4 Variable Selection

The study examined the financial statements of selected 66 companies that alone fulfilled the criteria, established for this study. The percentage change of figures over the last 5 years is tremendous for distressed as well as non distressed companies. By comparing these absolute increase and decrease across companies, there are similarities between the distressed companies.

On the face of the balance sheet, it can be identified that there is an increase in the size of assets for non distressed companies and a decline in the asset size of the distressed companies. The decline is significant for companies facing losses. The decline in the asset was caused by a decline in accounts receivables, inventories, property and equipment. On the liability side, there was a significant increase in the current liabilities and the current portion of long term debt accounts. On the other hand, the value of long term liabilities decreased and in some cases reduced to zero.

On the equity side, almost 60% of the financially distressed companies have increased the number of share issues in last few years before financial distress. It seems that these companies were desperately trying to raise cash in order to pay long term debt.
Analyzing the income statement of companies, it is found that sales of 70% of the distressed companies have increased that resulted on increase in operating, selling, administrative, research and development expenses. The increase in sales has not brought cash flow, but remained as book profit for years. This was one of the causes for financial distress of companies.

An analysis over cash flow statement of each company indicates that 70% of the non-distressed companies reported an increase in cash used in operating activities and investment activities, whereas 50% of them reported a decrease in cash provided by financial activities. The distressed companies found a great difficulty in maintaining cash profit.

1.5.5 Procedure for selection of ratios

Past studies have taken many ratios into consideration but the ratios selected for the present study are based on how a ratio helps to identify the distressed situation of companies in India. To identify whether the cash flow ratios are better predictors of financial distress than the financial ratios, the two categories of ratios, taken for computation are:- Financial Ratios and Cash flow ratios.
1.5.5.1  Financial Ratios used in the study

This present study has made use of ten financial ratios that are presented in table 1.3. All of such ratios have been chosen from the past studies, made by the researchers in other developed countries. The ratios which were used by the researchers in their studies and found appropriate are considered for this study. All these ten ratios were put into the Kolmogorov-Smirnov test of normality to identify their normality. After the outlier was identified and removed, the ratios were sent for Discriminant analysis.

Table 1.3  FINANCIAL RATIOS USED IN THIS STUDY

<table>
<thead>
<tr>
<th>S.No</th>
<th>Ratios</th>
<th>Expansion of Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC / TD</td>
<td>Net Cash / Total Debt</td>
</tr>
<tr>
<td>2</td>
<td>NI / S</td>
<td>Net Income / Sales</td>
</tr>
<tr>
<td>3</td>
<td>NI / TA</td>
<td>Net Income / Total Assets</td>
</tr>
<tr>
<td>4</td>
<td>CL / TA</td>
<td>Current Liabilities / Total Assets</td>
</tr>
<tr>
<td>5</td>
<td>CL + LTL / TA</td>
<td>Current Liabilities + Long-term liabilities / Total Assets</td>
</tr>
<tr>
<td>6</td>
<td>C + REC / TA</td>
<td>Cash + Receivables / Total Assets</td>
</tr>
<tr>
<td>7</td>
<td>WC / TA</td>
<td>Working Capital / Total Assets</td>
</tr>
<tr>
<td>8</td>
<td>C / CL</td>
<td>Cash / Current Liabilities</td>
</tr>
<tr>
<td>9</td>
<td>CA / CL</td>
<td>Current Assets / Current Liabilities</td>
</tr>
<tr>
<td>10</td>
<td>NW / S</td>
<td>Net Worth / Sales</td>
</tr>
</tbody>
</table>
1.5.5.2  **Cash flow ratios used in the study**

In addition to the financial ratios used, this study has made use of ten Cash flow ratios that are presented in table 1.4. All such ratios have been chosen from the past studies, carried out by the researchers in developed countries. The ratios which were suggested by many researchers and found suitable are considered for this study. All these ten ratios would be put into the Kolmogorov-Smirnov test to identify their normality. After the outlier was identified and removed, the ratios were sent for Discriminant analysis.

**Table 1.4  CASH FLOW RATIOS USED IN THE STUDY**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Ratios</th>
<th>Expansion of Ratios</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CFO / TEFS</td>
<td>Cash flow from operations / Total external financing sources</td>
</tr>
<tr>
<td>2</td>
<td>CFFA / TSC</td>
<td>Cash flow from financing activities / Total sources of Cash</td>
</tr>
<tr>
<td>3</td>
<td>CFFA / TA</td>
<td>Cash flow from financing activities / Total Assets</td>
</tr>
<tr>
<td>4</td>
<td>CFO / NI</td>
<td>Cash flow from operations / Net Income</td>
</tr>
<tr>
<td>5</td>
<td>CFO / TSC</td>
<td>Cash flow from operations / Total sources of cash</td>
</tr>
<tr>
<td>6</td>
<td>CFO / TA</td>
<td>Cash flow from operations / Total Assets</td>
</tr>
<tr>
<td>7</td>
<td>CFO / S</td>
<td>Cash flow from operations / Sales</td>
</tr>
</tbody>
</table>
The significant contribution of the ratios towards prediction of financial distress is done through a statistical test. In order to arrive at a final profile of variability, the following procedure was considered:-

(I) To identify the normality of data, Kolmogorov – Smirnov test was implemented.

(II) The multivariate discriminant analysis was applied to identify the discriminating ratios and their discriminant score.

(III) The inter-correlation between the relevant variables was identified.

(IV) Observation of the predictive accuracy of the various profiles was made.

(V) Identifying Z, the total index or score and the trends of failure.

Several past studies concluded that failing companies exhibit significantly different ratio measurements than the continuing entities. Altman, in one of his studies compared a list of ratios individually for failed companies and a matched sample of non-failed companies. He found that observed evidence for five years prior to failure was cited as conclusive that ratio analysis can be useful in the prediction of failure of entities.
The present study has taken into consideration a pair of failed as well as non failed entities for identification of financial and cash flow ratios that contribute towards financial distress. The study is done for a time period of 5 years where predictions validity was more concrete. This study implies a definite potential of ratios as predictors of financial distress. In general, ratios measuring profitability, liquidity, and solvency prevailed as the most significant indicators. The order of their importance is not clear since almost every study cited a different ratio as being the most effective indication of impending problems.

1.5.6 Justification and development of prediction model

1.5.6.1 Which model is the best?

A number of research studies in the literature have used complex bankruptcy prediction models. However, one of the most controversial questions is which model is the best. According to Wallace \(^{41}\)(2004), “a triangulation approach, whereby multiple methods are applied would be appropriate.” Atiya \(^{42}\)(2001) argues that “the Neural Network approach has generally outperformed other existing studies having in consideration the existence of saturation effects in the relationships between financial ratios and the prediction of default”. At the same time, Altman \(^{43}\) (2000) advocated the superiority of the Z-score model. According to Altman, the advantage of
using MDA analysis is considering an entire profile of characteristics that are common to the relevant companies as well as the interaction of these properties. Shirata\textsuperscript{44} (2003) compared three models for bankruptcy discrimination: linear, quadratic, and a non-parametric (e.g. neural network) normal kernel model. The results confirmed that the linear model had the strongest results while the quadratic and non-parametric produced unstable results. Shirata’s study makes a strong point in the literature towards the advantage of using the linear model. However, the bankruptcy phenomenon does not have a standard symptom or a specific identifiable pattern. Therefore, it is difficult to claim the best method of measurement. Thus, the researcher can point out only the preferred and non-preferred methods under different circumstances. In Shirata’s and Altman’s case, the preferred model is the linear model. Considering the popularity and utility of the model, linear model is applied in this study.

1.5.6.2 \textit{Which ratios are most important in predicting default?}

Once the model is chosen, it has to design the study by determining the independent variables. In this case, the independent variables are financial ratios as well as the cash flow ratios. Most studies [e.g. Deakin, 1972; Altman, 1968; Shirata, 1998; and others] use a pool of significant ratios and apply correlation and significance tests to select the most relevant
ones. The tests used are stepwise and *classification and regression trees* (CART). CART is a decision tree model that arranges data into a set of terminal nodes. These nodes are decision points and at each point, the data are partitioned into branches. Shirata (2003) and (1998)\(^{45}\) used both stepwise and CART to select the variables in order to “confirm the accuracy of parameter selection through comparison of the results”. The stepwise method assumed that the variables are normally distributed while CART selected the variables accurately without any requirements of statistical assumption.

The afore-mentioned studies imply a group of relevant ratios that should be used in order to create a significant model. However, there is no hierarchy to determine the importance for these financial ratios as well as cash flow ratios. In general, ratios measuring profitability, liquidity, and solvency have prevailed as the most significant parameters. Shirata remarked that “profitability and liquidity ratios can predict bankruptcy only to a certain extent” (1998,12). She concluded “that these financial ratios could not expose the financial distress of Japanese companies” (1998, 12).

Beaver\(^{46}\) (1967) concluded that the cash flow to debt ratio was the single best ratio predictor. Altman (2000) does not point to a single best ratio, however he advocates a combination of ratios “based on their
popularity in the literature and their potential relevancy” (2000, 9) to his specific study.

In this present study, to identify the ratios that influence the predictability of financial distress and to predict the normality of data Kolmogorov – Smirnov test has been implemented. This step removed all those ratios that do not match the normality test before applying the discriminant analysis. The discriminant analysis helps in identifying the ratios that have the greater power to indicate the state of financial distress of a company.

1.5.6.3 Are variables influenced by industry type and asset size?

It is widely believed that industry size and industry type influence the predictive power of the financial and cash flow ratios. Altman\textsuperscript{47} concluded that "it is not completely clear what the relationship is between size and ratio". However, Shirata’s (1998) results contradicted the results of Altman. She concluded that “the variables selected in a study can significantly discriminate the bankrupt group independent of industry and size” (Shirata,1998). In addition, another study was concerned with ratios of large asset-size corporations that experienced difficulties in meeting their fixed indebtedness obligations."
The present study does not validate the study of Shirata, conducted in the year 1998 that variables that become part of the study are not influenced by industry type and asset size.

1.5.6.4 Are financial patterns influenced by macroeconomic phases?

Another question examined in the research is whether there is a difference in financial patterns in phases of economic downturn and recovery. Namsik and Lee\textsuperscript{48} analyzed bankruptcy during the 1998 Korean economy crisis and compared the same to the Korean economic stability period of 1991-1995. They found that “in period of economic stabilization capital turnover ratio and total assets cash flow ratio are significant, while in an economic crisis, liabilities to cash flow ratio and fixed assets to long-term debt ratio are significant”.- Shirata\textsuperscript{49} (2003, 4). Although there has been a great deal of research emphasis in this area, the impact of the overall economic environment is a major factor that should be taken into consideration in predicting default. The present research finds that an economic indicator also helps in identifying the status of a company.

1.5.6.5 How does accounting logic affect statistical relevance?

Studies have shown that there is a trade-off between statistical relevance and accounting logic. Shirata (1998) has placed a special emphasis on the issue of variable selection. She argues that there are shortcomings in
using only statistical means (Stepwise and CART) as methods for ratio selection. As she shows in the 1998 study, statistical significance does not always follow accounting logic; therefore it is dangerous to select the variables using only statistical logic. For example, assume that statistics show that the current ratio is better than the quick ratio in analyzing liquidity in current assets. Accounting logic contradicts this result. The current ratio includes inventories while quick ratio does not. Consequently, the result may cause mistakes in assessing liquidity. In this case, the researcher should use accounting logic and not statistical results. But to prove it as per research, accounting logic as well as statistical relevance play a major role. Almost all studies have approved those ratios that were also statistically proved to be part of the study. Although the other ratios that are relevant but not statistically proved were eliminated. It shows that statistically proved ratios can only become part of identification of distress state of an entity. Balance sheet and income statement data were collected only after the initial groups are defined and companies are selected. Since a large number of variables found to be significant indicators of corporate problems in the past studies, a list of various potentially helpful variables (ratios) have been compiled for evaluation.
The ratios, used in this study have been chosen on the basis of their:-

1) Popularity in the literature, and
2) Potential relevance to the study

From the original list of variables, five variables have been selected as doing the best overall job together in the prediction of financial distress. In order to arrive at a final profile of variables, the following procedure has been followed:-

(1) Observation of the statistical significance of various alternative functions including determination of the relative contributions of each independent variable;
(2) Evaluation of inter-correlations between the relevant variables;
(3) Observation of the predictive accuracy of the various profiles; and
(4) Judgment of the analyst.

1.5.6.6 What weights should be applied to the selected ratios?

Once the independent variables are chosen, the study faces another dilemma: how to determine the corresponding weights for each variable. Altman (2002) and the majority of researchers (Shirata; Wallace; Zavgren) used coefficients, determined through regression as weights in their model. Therefore, these weights will be different if the sample changes or if new
variables are used. The weights used in this study are purely based on the multiple discriminant analysis weights that are assigned statistically.

1.5.6.7 Are timing issues a concern in financial distress prediction?

Another question examined in the research is whether using data from different years can impact the financial distress prediction model. Shumway (2002), who studied hazard models, has criticized the “static” type of analysis where the data samples span several years: Altman’s data (1968) span 20 years; Shirata’s data (2003) span 9 years. Shumway argues that because the characteristics of most companies change from year to year, static models ignore data on healthy companies that go bankrupt and such models study one set of variables at one point in time. Altman (2000, 7) admits that a “20-year sample is not the best choice because average ratios do shift over time.” However, he concluded that one financial statement prior to distress “yields the most accurate post-model building test result”.

Shirata (1998) considered that a large sample spanning several years develops a “Generalizable Model”. Shumway’s (2002) reason for choosing a hazard model is based on three reasons:

(1) static models fail to account for the period of time in which a company was at risk before becoming bankrupt;
(2) hazard models analyze a company’s failure through annual observations using time-varying covariates; and

(3) hazard models are preferable because they analyze a large data sample over long period of time.

Shumway’s conclusion has not been proven in research or practice, and therefore, it is not clear if the hazard models are more predictive than other types of study. The present study has considered only 5 years that include 4 years prior to the financial distress and the 5th year that is the year of financial distress.

1.5.7 Z - Score Model (Altman-1968)54

This model is a multi-variate approach built on the values of both ratio-level and categorical uni-variate measures. These values are combined and weighed to produce a credit risk score that best discriminates between companies that default and those that do not. The Z-Score model has been constructed using multiple discriminant analysis - a multivariate technique that analyzes a set of variables to maximize the difference between group variance while minimizing the within group variance. This is a sequential process in which the analyst included or excluded variables based on various statistical criteria.
From the original set of 22 variables, the final Z-Score model, chosen by Altman in his study was the following discriminant function of five variables:

\[ Z = 0.012X_1 + 0.014X_2 + 0.033X_3 + 0.006X_4 + 0.999X_5 \]

*Where:*  
\( X_1 = \) working capital / total assets,  
\( X_2 = \) retained earnings / total assets,  
\( X_3 = \) earnings before interest and taxes / total assets,  
\( X_4 = \) market value equity / book value of total liabilities,  
\( X_5 = \) sales / total assets, and  
\( Z = \) overall index

**1.5.7.1 What is the Z-score measuring?**

According to Altman, it is more than simply an assessment of bankruptcy potential. When viewing the component ratios, one can reveal many of the critical issues / risks, faced by the corporations that are assessed by traditional ratio analysis:

- Liquidity issues are measured in \( X_1 \)
- Shareholder claims against assets are measured in \( X_2 \) (low for a highly levered company)
- Profitability is measured in \( X_3 \)
• Shareholder confidence (indicated by stock price) relative to debt is measured in $X_4$ (low for an overly levered company)

• Asset utilization is measured in $X_5$

Each one of these issues / risks can potentially create significant problems (Liquidity problems, operational problems, leverage problems, etc) for the company and individually can be analysed much more extensively.

The researcher has made use of Z Score Model of Altman as the basis for building new models to predict financial distress of companies using both financial and cash flow ratios in this present study.

1.5.8 ALGORITHM OR PROCESS

The procedure applied to do analytical test is as follows:-

(I) Selection of the industry and the companies in the industry.

(II) Identifying the distressed companies based on the auditor’s report and finding a non-distressed mate for each distressed company.

(III) Comparing with the asset size, selection of the companies from the same industry based on the established criteria.

(IV) The companies selected should have the financial statements for the years from 2003-04 to 2007-08 in the same format.
After the variables are selected for computation of ratios, the ratios are calculated using MS Excel.

After the variables are transposed and arranged in MS Excel, these are taken for further analysis in SPSS.

Kolmogorov-Smirnov test is used to identify the normality of ratios.

After the outlier is identified and removed, the ratios are sent for discriminant analysis.

All the ratios that have normality become part of Multiple Discriminant Analysis (MDA).

Multiple discriminant analysis is used to identify that among the used ratios which ratio is more discriminant than the others.

Removing the ratios that do not form part of the discriminant analysis and selection of the ratios that have the discriminant ability.

Computation of Z score of the companies for the study period of five years, using the ratios identified.

After computing the Z score, implement the cut off rate.

Classifying the companies as distressed or non-distressed based on their Z-score.
1.6 SCOPE OF THE STUDY

Prior to the introduction of new cash flow standards, traditional operating cash flow ratios were employed for financial analysis in few developed countries. The cash flow from operations had to be estimated from the statement of changes in financial position or Balance Sheet and suffered from the inherent limitations of cash flow reporting, not based on the cash flow statement. The primary categories of cash flow activities had not been specified and the term ‘cash’ had not been defined. Therefore, ratios lacked comparability over time and across entities.

The first ratio ever to be recorded was the current ratio that was used to measure liquidity. Ratios were originally developed as devices of short-term credit analysis and can be traced as far back as the late 19th century. Since then, analysts have developed many financial ratios that are widely used by practitioners and academics. With the requirement to prepare a cash flow statement as part of financial reporting, a need has arisen for cash flow ratios. Useful cash flow ratios may be derived from cash flow information of the cash flow statement.

Operating cash flow ratios may also provide a more complete picture of an entity’s ability to generate sufficient operating cash flow to serve its debt and equity obligations and to fund asset acquisitions.
If cash flow information is useful but unused, the logical conclusion is that the analysts are not analysing available data properly. While there is no general consensus on appropriate set cash flow ratios, this study has explored the relative utility of cash flow ratios in financial analysis and will determine if the potential exists to predict financial distress.

A cash flow analysis can be used to address an entity’s cash flow dynamics and it should throw light on questions such as:

- Is the strength of internal cash flow generation positive or negative? Negative because the entity is growing, or operations are unprofitable, or is the entity having difficulty managing its working capital properly?
- Were short-term financial obligations such as interest payment met with operating cash flows?
- Was the amount of cash invested in growth financed by internal cash flows, or did it rely on external financing?
- Were dividends paid from internal free cash flow, or did these rely on external financing?
- Is the type of external financing on which an entity relies short-term or long-term debt?
Does the entity have excess cash flow after making capital investments?

Cash flow ratios can be used to answer all such mentioned questions. A cash flow analysis focuses on a company’s liquidity, solvency and financial flexibility, since debt obligations are met with cash. This will result in adequate lines of credit, unrestricted cash availability, debt maturity schedules with respect to financing requirements and the willingness to issue shares. This allows an analyst to examine an entity’s liquidity, and how the entity is managing its operating, investing and financing cash flows.

Entities in the public sector / utilities, transportation, investment, banking, insurance and finance are not included in the study. According to Mossman et al. (1998:36) as well as in other studies (Gilbert et al., 1990: 162; Beaver, 1966:72), financial institutions were excluded as their ratios and cash flows are always substantially different from those of other entity types, even when they are in no danger of failure. Ohlson (1980:114) also excluded financial institutions from a study on the prediction of bankruptcy as entities in the financial and investment industries are structurally different and have a different bankruptcy environment. The reason for this is that the central objective of a bank is to attract funds at an acceptable cost and reinvest the same at a higher return. Therefore, financial ratios were
developed specifically for the analysis of the banking industry (Stanko & Zeller, 1994). This present study has been restricted only to the Indian private sector manufacturing companies with the asset size up to 100 crore Rupees.

1.7 PERIOD OF THE STUDY

This study has made use of secondary data relating to the various aspects of financially distressed and non-distressed companies available in the software named ‘Prowess’ of CMIE Ltd for a period of five years from the year ended on 31st March 2004 to 31st March 2008.

1.8 LIMITATIONS OF THE STUDY

a) This study is based on the secondary data. The limitations associated with the source of the data are also the limitations of this study.

b) This study is restricted only to the private sector companies of manufacturing industry. The findings of the study cannot be validated for the companies in other sectors such as Public sector companies, Companies in service, finance, Insurance, etc.

c) This study restricts the application of suggested financial distress prediction models only to the Indian private sector manufacturing companies with the asset size up to 100 Crore Rupees.
d) The number of companies for which the data available in the software ‘Prowess’ also varies from time to time. This does not help in determining a proper size of sampling.

1.9 HYPOTHESES FOR THE STUDY

Ha 1:- Financial Ratios have the normality to predict financial distress of companies

Ha 2:- Financial ratios have significant ability to predict financial distress of companies

Ha 3:- Cash flow ratios have the normality to predict financial distress of companies

Ha 4:- Cash flow ratios have significant ability to predict financial distress of companies

Ha 5:- Cash flow ratios are better predictors of financial distress of companies than financial ratios

1.10 DEFINITIONS OF IMPORTANT CONCEPTS AND TERMS USED

(a) Financial Distress

According to the study, ‘Financial distress’ is defined as “the inability of a company or failure of a company to pay its financial obligations on the specified time period”. Operationally, a company is said to have failed when
any of the following events have occurred: bankrupt, loan default, an overdrawn bank a/c, or non-payment of a preferred stock dividend and non-payment of interest. In this study, a company is said to have failed if it is not able to generate cash from operating activities.

(b) **Financially distressed company or failed entity**

In practice, any company with higher book profits, higher EPS and higher share price is said to be successful. Such a company which is said to be successful, but unable to generate cash from operating activities and mainly depends upon new borrowings to pay off the old borrowings is called as a failed entity in this study. The moment a company is unable to generate cash from operations, increase its borrowings and pays off the existing or old borrowings from the current or new borrowings, the company is said to be a financially distressed or a failed entity.

(c) **Non-failed or Financially non-distressed company**

Non-failed or Non-distressed Company is defined as” a company that is capable of performing operational activities as well as meeting out its payment of financial obligations promptly”.

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(d) **Predictive ability**

It is defined as” to predict the failure of the company before the company becomes incapable to pay its financial obligations before they mature or when the company has failed in various dimensions”.

(e) **Cash flow from operations**

Cash flow from operations is the amount available in the Cash flow statement (as per AS-3) against the title ‘Cash flow generated from operations’. It is the end result of operating activities of an entity for an accounting period.

(f) **Net Cash or Cash flow**

Net cash is otherwise called as Cash flow. In this study, net cash refers to the total of (i) Profit after tax (PAT) (ii) Depreciation and (iii) Amortization. Therefore, it is amount calculated and not directly given in the profit and loss account of an entity’s financial statements.

(g) **Cash flow Statement**

The Institute of Chartered Accountants of India (ICAI) issued an Accounting Standard AS- 3 on the subject titled ‘Cash Flow Statement’ in April 1997. This has replaced the earlier AS- 3 on ‘Statement of Changes in Financial Position’. However, the standard has been made mandatory with effect from 1st April 2001 in India. Cash flow statement refers to the
statement, prepared and published as per the Indian Accounting Standard-3 titled ‘Cash flow statements’. The same has been detailed as per International Accounting standard – 7. As per AS-3 (revised) in India, Cash flow statement is an integral part of the financial statements. Cash flows arising from operating, investment and financing activities are shown in the Cash flow statement on Net basis. Non-monetary transactions should be disclosed outside the Cash Flow Statement.

1.11 CHAPTERISATION

This study consists of Five Chapters, presented as follows:-

**Chapter- I   Introduction and Methodology**

The first chapter addresses the title, statement of the problem, objectives, scope of the study, limitations and methodology of the study. This chapter also spells out clearly in all its magnitude the importance of developing models using a set of financial as well as cash flow ratios to predict the financial distress of business entities.

**Chapter- II   Review of Literature**

This Chapter presents the literature related to the cash flow statement, cash flow information, cash flow ratios, multiple discriminant analysis, and accrual accounting.
Chapter- III  Critical Analysis of Cash Flow Statement and Cash flow Ratios

This chapter presents an overview of Cash Flow Statement as per AS-3 (revised in India) and made a comparison between International standard IAS-7 on Cash Flow Statement with that of the Indian One. In addition, this Chapter describes the available cash flow ratios, suggested by various authors as being important for financial analysis.

Chapter- IV  Analysis and Interpretation of data

This Chapter presents the results and gives a detailed explanation of the same using required statistical tools.

Chapter- V  Summary of findings, suggestions and conclusions

In this Chapter, a summary of the study is given. Findings of the study are presented and possible recommendations have also been discussed. The suggestions for future research are also presented.
REFERENCES:


22. Dun and Bradstreet., “The Failure Record”, 1980 and annually


39. “*Prowess*”- a data base software, owned and maintained by “Centre for Monitoring India Pvt Ltd” (CMIE).,


