CHAPTER I

INTRODUCTION AND DESIGN OF THE STUDY

I.1 Introduction

The capital structure (CS) problem is, perhaps, one of the prime areas of attraction for many researchers in the area of finance. It deals with the firm’s choice of the types of securities to issue. Myers (1984) has rightly mentioned CS as “The capital structure puzzle”. The determinants of optimal CS and its influence on the CS decision are still an unsolved problem, giving ample scope for further research. Pioneered by the work of Modigliani and Miller, (1958) who studied the impact of corporate tax in use of debt capital, many researchers viz., Jensen and Meckling (1976), Myers (1984), Kester (1986), Titman and Wessel (1988), Rajan and Zingales (1995), Jonson (1998), Booth Collins et al. (2001), Dogra and Gupta (2009) have analyzed the factors that determine the CS of a firm and while there exist varied views about the relation between profitability (P) and CS. The necessity for such researches, in this area, has gained importance as globalization and stiff competition have forced today’s corporate firms to determine that level of debt, which offers increased P to the firm’s owners without unduly increasing the risk of insolvency and at the same time make the firm a less attractive target for corporate restructuring viz., merger or takeover.

This chapter gives a precise introduction to the food industry in India, the problems faced by the industry, governmental measures and the significance of the study in untangling the problem. The CS theories and the P theories are also briefly discussed to identify the gap in the previous works and also to set the objectives of the present study. It also presents the research design of the study, wherein the problems of the study, the significance, scope, objectives, hypotheses, methodology, research methods for analysis, sampling design, period of the study, limitations, and chapter design are stated.
I.2 Capital Structure Theories

Capital Structure (CS) has been defined as “that combination of debt and equity that attains the stated managerial goals (i.e.) the maximization of the firm’s market value”.

The optimal CS is also defined as that combination of debt and equity that minimizes the firm’s overall cost of capital.

I.2.1 Net Income Approach

According to this approach, the cost of debt and the cost of equity remain unchanged when the debt – equity ratio varies. Debt is treated as the cheaper source of finance. So when debt increases the average cost of capital decreases. This approach suggests that the cost of capital decreases continuously with leverage so the firm should use as much leverage as possible.

I.2.2 Net Operating Income Approach

This approach states that an increase in the use of debt funds, which are apparently cheaper, is offset by an increase in the equity capitalization rate. So there is no advantage in using debt financing. David Durand advocated eloquently in support of this approach and he argued that the market value of a firm depends on its net operating income and business risk. Leverage merely changes the distribution of income and risk between debt and equity without affecting the total income and risk which influence the market value of the firm.

I.2.3 Traditional Approach

The Traditional Approach is compounded between net income approach and net operating income approach. It assumes the cost of debt capital remains more or less constant up to a certain degree of leverage (LEV) but rises thereafter at an increasing rate. The cost of equity capital remains more or less constant up to a certain degree of LEV and rises only gradually up to a certain degree of leverage and rises sharply thereafter. The average cost of capital as consequences of the above behavior of cost of debt and equity, decrease up to a certain point, remains more or less unchanged for moderate increase in LEV, thereafter and rises beyond a certain point.
I.2.4 Modigliani and Miller Proposition

Modern theory of CS began with the valuable contribution of Modigliani and Miller (1958)\textsuperscript{15} who framed the basis upon which the other researchers have made improvements. They identified the lack of an adequate theory of the effect of financial structure on market valuations and have formulated a theory that can answer the cost-of-capital question. This theory also permitted the development of the theory of investment of a firm under conditions of uncertainty.

The theory assumed a perfect capital market where there is no problem of asymmetric information: there are no transaction costs; no bankruptcy cost and the securities are infinitely divisible. Managers act in the interest of shareholders and the firms can be grouped into equivalent risk classes on the basis of their business risk. They assumed that there is no tax. However, Modigliani and Miller (1963)\textsuperscript{16} made a correction to bring out the tax advantages of debt financing in the work “Corporate Income Taxes and the Cost of Capital: A Correction”. In this work they viewed the value of the firm as a function of leverage and the tax rate.

In their proposition I they considered the value of the firm to be independent of its CS. This proposition was more or less similar to that of the net operating income approach. They viewed the value of a firm as a function of expected operating income divided by the discount rate appropriate to its risk class. They proved that the average cost of capital within a given class is independent of the degree of LEV\textsuperscript{17}.

The proposition II held that financial leverage (FL) increases the expected earnings per share (EPS) while the share price remains constant. This is because the change in the expected earnings is offset by a corresponding change in the return required by the shareholders\textsuperscript{18}.

Their proposition III made an attempt to develop the Theory of Investment. They concluded that an investment financed by common stock is advantageous to the current stockholders if and only if its yield exceeds the capitalization rate. When a corporate income tax, under which interest is a
deductible expense, is considered, gain can accrue to stockholders from having debt in the \( CS \), even when capital markets are perfect\(^{19}\).

I.2.5 Trade-off Theory

Trade-off theory, implies that company’s \( CS \) decision involves a trade-off between the tax benefits of debt financing and the costs of financial distress.

I.2.6 Static Trade-off Theory

In a Static Trade–off framework the firm is viewed as setting a target debt to value ratio and gradually moving towards it (Myers 1984)\(^{20}\). The theory says that every firm has an optimal debt–equity ratio that maximizes its value. This optimal debt-equity ratio is determined by a trade off of the cost and benefits of borrowing, holding the firm’s assets and investment plans constant. The benefits derived from interest tax shields are offset against various costs of financial distress and agency cost.

I.2.7 Dynamic Trade-off Theory

Implementing the role of time is very significant in identifying the optimal \( CS \). The first dynamic models to consider the tax savings versus bankruptcy cost trade-off are Kane et al. (1984)\(^{21}\) and Brennan and Schwartz (1984)\(^{22}\). Their models took into consideration: uncertainty, taxes, and bankruptcy costs, but no transaction costs.

I.2.8 Effects of Bankruptcy Cost

Another important imperfection affecting \( CS \) decision is the presence of bankruptcy cost. When a firm is unable to meet its obligations it results in financial distress that can lead to bankruptcy because a major contributor to financial distress is debt. Expected bankruptcy cost is higher for firms with more volatile earnings, which should drive smaller, less-diversified firms toward fewer targets \( LEV \).

I.2.9 Agency Costs

Jensen and Meckling (1976)\(^{23}\) put forward the concept of agency costs. Agency theory recognizes that the interests of managers and shareholders may conflict. Debt financing is a crucial factor that limits the free cash flow available
to managers and thereby helps to control this agency problem (Jensen and Meckling 1976)\textsuperscript{24}.

### I.2.10 Signalling Theory

Myers and Majluf (1984)\textsuperscript{25} proposed a new theory, called the signalling, or asymmetric information theory of CS. They demonstrated that with asymmetric information, equity issues are rationally interpreted on average as bad news, since managers are motivated to make issues when the stock is overpriced.

### I.2.11 Market Timing Theory

Baker and Wurgler (2002)\textsuperscript{26} suggested a new theory of CS: the “market timing theory of CS”, which states that the current CS is the cumulative outcome of past attempts to time the equity market.

### I.3 Profitability Theories

\( P \) consists of two words profit and ability. It is necessary to differentiate between Profit and \( P \) at this point. Profit, from accounting point of view, is arrived at by deducting from total revenue of an enterprise all amount expended in earning that income. Profitability (\( P \)) is defined as the ability of a given investment to earn a return from its use\textsuperscript{27}.

\( P \) can be measured as profit shown as a percentage of sales known as profit margin. It can also be expressed as Return on Investment (ROI)\textsuperscript{28}. Since this study concentrates on the relationship between CS \& \( P \), the ROI may be apt. The theories mentioned below focus on the \( P \) of the firm.

### I.3.1 Pecking Order Theory

In contrast to Static Trade-off theory, which states that every company has a target optimal debt-equity ratio, the pecking order stresses a financing order rather than a target debt-equity ratio. This theory states that highly profitable firms prefer internal funds and when external funds are required the firm will borrow, rather than issuing equity. The pecking order theory explains why the bulk of external financing comes from debt. It also explains why more profitable firms borrow less: not because their target debt ratio is low — in the pecking order they don’t have a target—but because profitable firms have more internal
financing available. Less profitable firms require external financing, and consequently accumulate debt\(^{29}\).

**I.3.2 Free Cash Flow Theory**

This theory is also framed for matured firms that are prone to overinvest. It says that high debt levels will increase value, despite the threat of financial distress, when a firm’s operating cash flow significantly exceeds its profitable investment opportunities. Thus, the profit earning capacity increases the value of the firm despite the threat of financial distress\(^{30}\).

**I.4 Food Industry in India**

India is the world’s second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector. India is the third largest producer of food grain and the second largest producer of fruits and vegetables\(^{31}\). Agriculture sector provides employment to 52% of country’s work force and is the single largest private sector occupation, while, the contributory share of agriculture in gross domestic product (\(\text{GDP}\)) has decreased over years. The share in \(\text{GDP}\) was 55.4% in 1950-51, 52% in 1960-61, reduced to 18.5% in 2006-07 and agriculture and allied sectors account only for 15.7% of the \(\text{GDP}\) for the year 2009–10\(^{32}\). This is a crucial area to be considered to enhance the Indian economy.

**I.5 Food Management in India**

Food management in India has three basic objectives:

- Procurement of food grains from farmers at remunerative prices.
- Distribution of food grains to consumers particularly the vulnerable sections of the society at affordable prices.
- Maintenance of food buffers for food security and price stability.

The instruments of food management are the minimum support price (\(\text{MSP}\)) and central issue price (\(\text{CIP}\)). The nodal agency which undertakes the procurement and distribution and storage of food grains is the Food Corporation of India (\(\text{FCI}\))\(^{33}\). *Table I.1* shows the procurement of rice and wheat over the years.
### Table I.1

**Production and Procurement of Rice and Wheat in India**

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (in mn MT)</th>
<th>Procurement of rice and wheat (in mn MT)</th>
<th>Procurement as % of production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rice</td>
<td>Wheat</td>
<td>Total</td>
</tr>
<tr>
<td>2003-2004</td>
<td>88.5</td>
<td>72.2</td>
<td>160.7</td>
</tr>
<tr>
<td>2004</td>
<td>83.1</td>
<td>68.6</td>
<td>151.7</td>
</tr>
<tr>
<td>2005-2006</td>
<td>91.8</td>
<td>59.4</td>
<td>151.2</td>
</tr>
<tr>
<td>2006-2007</td>
<td>93.4</td>
<td>75.8</td>
<td>169.2</td>
</tr>
<tr>
<td>2007-2008</td>
<td>96.7</td>
<td>78.6</td>
<td>175.3</td>
</tr>
<tr>
<td>2008-2009</td>
<td>99.2</td>
<td>80.7</td>
<td>179.9</td>
</tr>
<tr>
<td>2009-2010</td>
<td>89.1</td>
<td>80.7</td>
<td>169.8</td>
</tr>
</tbody>
</table>

*Source: Economic Survey 2010 and Monthly Food Bulletin October 2010, Department of Food and Public Distribution, Ministry of Agriculture and Cooperation*

Driven by the recent rise in food prices and food scarcity faced by various countries, food security has begun to gain importance, with various governments taking an active role in agricultural development. To overcome the rising price and solve problems such as under-nutritioned children and women, growing hunger and inequality, the government has involved in the process of enacting National Food Security Act (NFSA). NFSA is envisaged as a path-breaking legislation, aimed at protecting all children, women and men in India from hunger and food deprivation. The motivation for the proposed NFSA to provide a guarantee of adequate nutrition is derived from the right to food as an aspect of the right to life under Article 21 (interpreted by the Supreme Court as a right to life with dignity), which is a fundamental right of all citizens. Even though the NFSA focuses mainly on food entitlements, the National Advisory Council (NAC) recommends that it should take a broad view and not restrict itself only to the Public Distribution System (PDS). NFSA supplements (i) the NAC recommendations on food security released on 23 October 2010; and (ii) the NAC Framework Note on the Draft National Food Security Bill released on 21 January 2011. Major issues covered under the act are as follows:
35 kgs per household per month at Rs 3/2/1 for rice/wheat/millets for priority category; 20 kgs at (at most) half of MSP for General category.

- Universalization of Integrated Child Development Services (ICDS).
- Counselling and support for optimal Infant and Young Child Feeding.
- Nutrition take-home rations for children under 3 and pregnant/lactating women.

I.5.1 Important Recommendations of NAC with regard to NFSA

- The NAC recommends an expansion of decentralised procurement as the path to higher procurement. More and more states should be encouraged to procure locally. This is far superior to FCI procuring food grains from a few states and distributing them across the country.

- The NAC strongly recommends inclusion of other nutritious cereals (such as bajra, jowar, ragi, and maize) as part of the food security basket using millets in several nutrition-related schemes, including ICDS, mid-day meals, community canteens and destitute feeding programmes.

- All ICDS services (supplementary nutrition, growth monitoring, nutrition and health education, immunization, referral and pre-school education) should be extended to every child under the age of 6 years, all pregnant women and lactating mothers and all adolescent girls.

- It also recommends that the Ministry for Consumer Affairs, Food & Public Distribution should serve as the nodal Ministry for the implementation of the NFSA.

India and the US also launched a joint initiative for an ‘Evergreen Revolution’ in agriculture to promote food security across the world. As part of the food security initiative, India’s expertise in agriculture sector will be shared with farmers in Africa. G-20 Finance Ministers have reached a compromise deal to correct global economic imbalances and expressed concern over excessive commodity price volatility impacting the world food security, an issue pressed by India.
I.6 Classification of Food Industry in India
The Food Industry in India is grouped into the following categories:

Diagram I.A
Classification of Food Industry

I. Food industry
- Dairy
- Tea
- Sugar
- Vegetable oils & products
- Coffee
- Other products

II. Beverages and tobacco
- Tobacco products
- Beer and Alcohol

Other products include:
- Cocoa products & confectionery
- Bakery products
- Processed / packaged foods
- Starches
- Marine food
- Poultry & meat products
- Floriculture
- Milling products

I.7 Advantages and Challenges Faced by Food Industry in India
India has diverse agro-climatic conditions and has a large and diverse raw material base suitable for food processing companies. India is becoming the eastern hub of the food industry. Not only does it have leading productions of various materials like milk, fruits and vegetables, grains and animal products but the food processing sector is also growing at a rapid rate to cater to domestic needs and the export market (JS Pai, executive director, Protein Foods and Nutrition Development Association of India (PFDAI)).
With its growing population, India is not only one of the largest producers of food materials but also a large consumer of food. This has brought about an imbalance between demand and supply leading to a rise in food prices. The economic slump had an adverse impact on most industries including the food & beverage (F&B) industry. However, the Indian economy managed to sustain from the collapse of the global growth and trade due to the global meltdown that took place in the year 2007-09 followed by the year 2008-09 which saw negative growth in agriculture and allied sector due to erratic monsoon and late rain in the year 2009-2010, which reflected in decreased food crop production leading to a rise in food inflation. The major problems faced by the industry are rising food prices, increasing transportation costs due to a rise in oil prices, and decline in consumer spending. Nevertheless, the F&B industry has been relatively less affected when compared to other industries. This is mainly attributed to the fact that food products continue to be essential to consumers in spite of the slowdown. The rising demand for food item and relatively slower supply response from the agricultural sector has led to frequent spikes in food inflation.

Another major problem faced by the food industry is the lack of proper infrastructure facility and proper storage facility. Although India is one of the world’s major food producers it accounts for less than 1.5 per cent of international food trade due to lack of proper infrastructure facility. High food prices, resulting from the combined effects of the weak 2009 monsoon and inefficiencies in the government’s food distribution system have shook Indian economy to the core. Lack of proper infrastructural facilities has led to a storage loss as high as 30% (The Food Corporation of India), which has added to the food inflation caused due to rising demand and adverse weather, tightening food supplies. Urgent efforts are needed to expand, improve and modernize storage of food grains in the country in order to arrest the wastage of food grains. However, the NAC has been informed that the government has already finalized a plan for food grain storage that will extend storage capacities to 58 million metric tonnes in the near future.

Development of food industry would be the right alternate for overcoming these setbacks. This development should necessarily be backed by good analysis.
and study of the financial structure of food industry to help it to grow faster and
direct the growth of the industry in the right path.

I.8 Current Status of Food Industry in India

The Food Industry in India is growing at over 9% per annum (Pai further
indicated)\textsuperscript{44}. The size of the food industry is as large as Rs. 4 lakh crore and
growing fast. It is one-fifth of the US food industry, which is $550 billion (Rs. 22
lakh crore). The total food production in India is likely to become double in the
next ten years and there is an opportunity for large investments in food and food
processing technologies, skills and equipment, especially in areas of canning,
dairy and food processing, specialty processing, packaging, frozen
food/refrigeration and thermo Processing. The “food industry is expected to
reach $ 258 billion by fiscal year 2015 and $318 billion by fiscal year 2020 from
the current level of $181 billion” (Federation of Indian Chambers of Commerce
and Industry (FICCI) Food Processing Committee Chairman, Shrijee Mishra).
Foreign direct investment (FDI) in agriculture has increased six-fold, rising from
$96.4 million in 2004 to $656 million in 2008\textsuperscript{45}. The US is the largest source
country followed by the Germany and the UK. The agriculture related FDI flows
are shown in table 1.2.

Table 1.2

\begin{tabular}{|l|c|c|}
\hline
\textbf{FDI Inflows in India} & \textbf{in $ million} & \textbf{$ \% $ to total} \\
\hline
Sugar & 5.0 & 0.76 \\
Vegetable oil & 44.1 & 6.72 \\
Tea and coffee & 52.4 & 7.99 \\
Hybrid seeds and plantation & 1.2 & 0.18 \\
Horticulture & 4.1 & 0.62 \\
Food processing & 150 & 22.86 \\
Fermentation industries & 388.7 & 59.23 \\
\hline
TOTAL & 656.2 & 100 \\
\hline
\end{tabular}

In the budget 2011-12, the Government of India has announced to set up 15 more mega food parks (MFPs) and also urged that the states should reform the Agriculture Produce Marketing Act (APMC) to improve the supply chain. In the 11th Five year plan, the number of food parks will be increased to a total of 30. The budget also allocated US$ 135 million to the Food Processing Ministry from the existing US$ 90 million. As a measure to boost investment in agriculture the minister extended the Viability Gap Funding Scheme (VGFS) for public private partnerships (PPP) for setting up modern storage capacity besides giving infrastructure status to cold chains.

The Vision 2015 of the Government of India also provides for enhancing the level of processing of perishable to 20 per cent, enhancing value addition to 35 per cent. All these facts indicate a wider scope for development of food industry in India. Studies and researches facilitate the advancement of the industry; hence the study is a step ahead of one such attempt. So analysis of the CS of food products manufacturing firms and analysis of the P of such developing industry becomes significant.

I.9 Origin of the Research Problem

Review of past studies in precise brings out different findings about between CS and P. Modigliani and Miller (1958) finding states that “when a corporate income tax is considered, gain can accrue to stakeholders from having debt in the CS even when capital markets are perfect”. Pecking Order Theory and Signaling theory have pointed out the importance of P in deciding CS. In contrast to Static Trade off Theory, the Pecking Order Theory states that when external finance is required, firms issue the safest security first (Myers 1984). Major US industrial firms follow a financing hierarchy (pecking order) and the managers consider the projected cash flow from asset to be financed as the main criteria in governing financing decisions (Pinegar and Wilbricht 1989). The works of Titman and Wessel (1988), Kester (1986), Chang (2003) and many others have considered P as one of the determinants of CS. Wald (1999) found that P was “the single largest determinant of debt/asset ratios” in cross-sectional tests for the US, the UK, Germany, France and Japan (Myers 2001), which shows how important P is in determining the CS of the firms. The ability of the
firm to earn consistent profit is the deciding factor of a firm’s CS. “Debt capacity” depends on the future $P$ and value of the firm; it may be able to increase borrowing if it does well, or be forced to pay down debt if it does poorly (Myers 2001). The works of Myers (1984), Kester (1986), Friend Hasbrouch (1988), Friend & Lang (1988), Titman and Wessel (1988), Rajan and Zingales (1995), Jonson (1998), Booth Collins et al. (2001), and Dogra and Gupta (2009) give empirical evidences in support of the negative relation between $P$ & LEV. Long & Malitz (1985) pointed out that LEV increases with increases in $P$ but their result was insignificant. Though there are varied views regarding the type of relation, the works give strong evidence that there is a binding link between $P$ & CS.

To throw light into these forbidden areas the following questions are considered relevant to be raised and need to be answered:

- What type of relation prevails between profitability and leverage?
- How important is profitability in determining the debt ratio / leverage of a firm?
- What is the impact of size and sector-wise difference on the relation between profitability and leverage?
- What are the other variables that determine leverage of the firms?
- What are the variables that determine the profitability of the firms?
- Does size and sector-wise difference influence the relation between the predictor variables and profitability?

In order to seek answer to the stated questions the following objectives are set.

**I.10 Objectives of the Study**

**I.10.1 General Objectives**

- To analyze the determinants of capital structure (leverage) with particular focus on the impact of profitability on capital structure.
- To analyze the determinants of profitability.
Chapter I

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I.10.2 Specific Objectives

- To study the relationship between profitability and leverage in general.
- To analyze the impact of profitability in determining capital structure / leverage of a firm when compared to that of the other variables.
- To analyze the impact of non debt tax shield, collateral asset, profitability, growth rate, size, age and volatility on leverage.
- To analyze the impact of aggressive investment policy, capital intensity, growth rate, size and volatility on profitability; and
- To analyze the impact of sales size, income size and sector-wise differences of firms in deviating the relationship between profitability and leverage.

I.11 Hypotheses Development

Hypotheses for the Preliminary Analysis

Myers (1984) developed pecking order theory, which gave a new frame to the role played by the profit earned in CS choice. It assumes that firms give more preference to retained earnings when deciding about financing a project. Titman and Wessel (1988), Pinegar and Wilbricht (1989) backed the pecking order theory with supporting findings. Titman and Wessel (1988), in their work “the determinants of capital structure choice”, analyzed LEV in three measures viz., short-term, long-term, and convertible debt rather than an aggregate measure of TD. Hence, the study also attempts to sub-divided CS to make a closer and detailed study about the relation between PBITD and the different constituents. The hypotheses are thus:

- \( H_0^1 \) = “There is no significant relationship between profit earned and the size of long-term debt of the firms”.
- \( H_0^2 \) = “There is no significant relationship between profit earned and the size of short-term debt of the firms”.
- \( H_0^3 \) = “There is no significant relationship between profit earned and the size of total debt borrowed by the firms”.
- \( H_0^4 \) = “There is no significant relationship between profit earned and the size of equity capital of the firms”.

A STUDY ON THE DETERMINANTS OF CAPITAL STRUCTURE AND PROFITABILITY
Rajan and Zingales (1995)\textsuperscript{11} put forth to light the impact of size on the relation between $P$ and $LEV$ stating that the negative influence of $P$ on $LEV$ should become stronger as firm size increases. The impact of size is studied in two ways- average turnover size and average income size. Hence the hypotheses are:

$H_o^5 = \text{“There is no significant influence of size of sales on the relation between profit earned and the various constituents of capital structure of the firms”}$.

$H_o^6 = \text{“There is no significant influence of size of income on the relation between profit earned and the various constituents of capital structure of the firms”}$.

Barton, Hill, and Sundaram (1989)\textsuperscript{12} studied relativity of business as a determinant of $LEV$ along with the other variables, hence the sector differences are also taken into consideration to study the impact of profit earned on level of various constituents of $CS$.

Hence, the hypothesis is:

$H_o^7 = \text{“There is no significant influence of sectoral differences on the relation between profit earned and the various constituents of capital structure of the firms”}$.

Hypotheses for the Core Analysis

Since we have two main objectives i.e., “to analyze the determinants of capital structure” and “to analyze the determinants of profitability”, the hypotheses developed are classified under two heads as stated below:

I.11.1 Hypotheses for Analyzing the Determinants of Capital Structure

Myers (1984)\textsuperscript{67} introduced pecking order which the firms use for financing their investment. His theory suggested that there is a negative relationship between $LEV$ and $P$. The works of Titman and Wessel (1988)\textsuperscript{68} also supported this view. Barton & Gordon (1988)\textsuperscript{69}, Johnson (1998)\textsuperscript{70} and other works also supported for a negative relation between $CS$ and $P$. Hence, large size firms with
consistent $P$ depend more on internal funds and when they are not sufficient they raise funds from a safer source i.e. debt capital.

In contrast to this, there are some views that the firms optimally recapitalize at the end of each period and this leads to a positive relationship between $\text{LEV}$ and $P$. To illustrate, Pandey (2004)\textsuperscript{71} predicted a positive relation between $\text{CS}$ and $P$. Less profitable firm will employ more internal funds as external financing is costlier, thereby $P$ creates the necessity of the firm to shield its excess profit from taxes.

Leland (1994)\textsuperscript{72} found that $\text{LEV}$ ratio is invariant to changes in $P$. Kane, Marcus and MacDonald (1984)\textsuperscript{73} and Wiggins (1990)\textsuperscript{74} also retain the Modigliani-Miller proposition that the firm’s cash flows are invariant to debt choice. These variations in the views of various experts create an interest in testing the existence of relationship between $P$ and $\text{CS}$. Thus, the hypothesis is:

$H_0^8 = \text{"There is no significant relationship between profitability and leverage of the firms".}$

Modigliani and Miller (1958)\textsuperscript{75}, pointed out that the size of non-debt corporate tax shields like deductions for depreciation and investment tax credits may affect leverage, and Givoly Collins et al. (1992)\textsuperscript{76} indicated that there exists a substitution effect between debt and non debt tax shields, and that both corporate and personal tax rates affect leverage decisions which makes it necessary to analyze whether there exists relationship between $\text{NDTXSH}$ and $\text{CS}$. Hence, the hypothesis is:

$H_0^9 = \text{"There is no significant relationship between non debt tax shield and leverage of the firms".}$

Myers (1984)\textsuperscript{77} argued that collateral asset ($\text{COLASS}$) will help the firms to easily access debt capital and therefore there exists a positive relationship between $\text{COLASS}$ and debt level, while Harris and Raviv (1991)\textsuperscript{78} argued that small firms with low levels of fixed assets would have more problems of asymmetric information, making them issue more debt, since under priced equity issues only is possible. Titman and Wessel (1988)\textsuperscript{79} identified opposite relation
between collateralizable capital and debt level. Hutchinson and Michaelas (1998)\textsuperscript{80} used collateral as one of the determinants of CS. Therefore, the hypothesis is:

\[ H_{10} = \text{"There is no significant relationship between collateral assets and leverage of the firms".} \]

Titman and Wessel (1988)\textsuperscript{81} established that growth (GROW) rates were negatively related to long-term debt, accepting the pecking order theory. Smith and Watts (1992)\textsuperscript{82}, Balakrishnan and Fox (1993)\textsuperscript{83}, and Fama and French (2002)\textsuperscript{84} indicated that GROW was found to have negative relation with LEV as the dependant variable, while Barton and Gordon (1988)\textsuperscript{85} provided evidence in the contrary stating that GROW rate is positively correlated with debt. Hence, the hypothesis is:

\[ H_{11} = \text{"There is no significant relationship between growth and leverage of the firms".} \]

Volatility (VOL) in profit increases the risk associated with the debt capital. Bradley, Jarrel, and Kim (1984)\textsuperscript{86}, Kester (1986)\textsuperscript{87}, and Titman and Wessels (1988)\textsuperscript{88} proved that leverage decreases with VOL. Johnson (1997)\textsuperscript{89} also determined the impact of VOL on LEV as one of the determinants. Hence, the hypothesis is:

\[ H_{12} = \text{"There is no significant relationship between volatility and leverage of the firms".} \]

Small enterprises are characterized by variability in profits and growth. Hutchinson and Michaelas (1998)\textsuperscript{90} showed that P did not affect the CS of small size firms, which fact shows some kind of influence of size (SIZ) on the relation of P with CS. Titman and Wessels (1988)\textsuperscript{91} indicated that larger firms have diversified business and therefore have lower possibility of experiencing financial distress, which leads to positive relationship between firm SIZ and debt level. Frank and Goyal (2003)\textsuperscript{92}, and Rajan and Zingales (1995)\textsuperscript{93} argued that larger firms have lesser problem of asymmetrical information reducing the chances of undervaluation of the new equity issue, which encourage large firms to use
equity financing. Therefore, there exists a negative relation between \( SIZ \) and \( LEV \).

Booth, Collins et al. (2001), Panday (2002), and Chen and Zhao (2004) also suggested that there exists a negative relation between \( P \) and \( SIZ \) in developing countries, therefore, the impact of \( SIZ \) of the firms on the relationship between \( P \) and \( CS \) should be analyzed. Hence, the hypothesis is:

\[ H_0^{13} = \text{"There is no significant influence of size in deviating the relationship between profitability and capital structure of the firms"}. \]

Barton, Hill, and Sundaram (1989) suggested that relativity of business influences \( LEV \). Miao (2005) also found that \( LEV \) ratio varies across industries. Thus, the hypothesis is:

\[ H_0^{14} = \text{"There is no significant influence of sectoral differences of firms in deviating the relationship between profitability and capital structure"}. \]

**I.11.2 Hypotheses for Analyzing the Determinants of Profitability**

Liquidity affects both the firm’s \( P \) as well as the operating risk (Papaioannou, Strock, and Travlos 1992). Aggressive investing policy (\( AIP \)) on the other hand, though risk involved, increases the profit of the firms, hence it becomes important to study the relation between \( AIP \) and \( P \). Hence, the hypothesis is:

\[ H_0^{15} = \text{"There is no significant relationship between aggressive investment policy and profitability of the firms"}. \]

Capital intensity (\( CAPINS \)) imposes a greater degree of risk because assets are frozen in long lived forms that may not be easy to sell, hence the difference in \( CAPINS \) may be associated with difference in \( P \) (Bettis 1981). \( CAPINS \) can affect \( P \) because, in uncontestable markets it offers the opportunity to make binding commitments of resources. It does so by tilting the cost structure of production from ongoing towards sunk cost: firms that compete in \( CAPINS \) industries typically have to shoulder large, unrecoverable outlays of capital in advance of production decision.
**CAPINS** can affect \( P \) because cut-throat competition might eliminate all future profits depressing each firm’s net security level. Thus, \( P \) declines with capital intensity (Ghemawat and Caves 1986). Based on this view, the following hypothesis is formulated:

\[ H_0^{16} = \text{"There is no significant relationship between capital intensity and profitability of the firms".} \]

Fluctuation in the profit earned by firms makes debt capital costlier. Consistent profit earning capacity is also looked into as a determinant of \( P \). Competitive market creates much of such risk. In more competitive markets where price cut out were sort for, \( P \) gets reduced due to higher cost of debt. The chances of financial distress and bankruptcy also increase (Pandey 2002). Volatility (**VOL**) in earning should be studied when considering consistent profit earning capacity; hence the following hypothesis is formulated:

\[ H_0^{17} = \text{"There is no significant relationship between volatility and profitability of the firms".} \]

More profitable firms tend to issue more debt as debt capital may be available at a cheaper rate. The negative relation between \( P \) and \( LEV \) ratio arises from firm’s preference of internal funds over external funds and the availability of internal funds (Chen and Zhao 2004). It is recommendable that more profitable firms should hold less debt since higher profit generates more internal funds (Bevan and Danbolt 2002). However, growing firms may have greater fund requirement to grab new opportunities, which may exceed their retained earnings, hence they act according to pecking order and choose debt rather than equity. Therefore, to study the relation between growth (**GROW**) and \( P \) the following hypothesis is formulated:

\[ H_0^{18} = \text{"There is no significant relationship between growth and profitability of the firms".} \]

Small enterprises are characterized by variability in profits and growth. Increase in \( P \) along with increase in size and age may aid them to grow at a faster rate (Storey Collins et al. 1987). The influence of sectoral difference on the relation between the predictor and \( P \) is also to be analyzed and hence to study
the impact of \textit{SIZ} and sectoral differences on \textit{P} the following hypothesis is formulated:

\[ \text{H}_0^{19} = \text{“There is no significant influence of size in deviating the relationship between the predictor variables and profitability of the firms”}. \]

\[ \text{H}_0^{20} = \text{“There is no significant influence of sectoral differences in deviating the relationship between predictor variables and profitability of the firms”}. \]

\textbf{I.11.3 Summary of Hypotheses of the Study}

The aggregate of hypotheses developed to achieve the stated objectives are as follows:

\begin{itemize}
  \item “There is no significant relationship between profit and different constituents of capital structure”.
  \item “There is no significant impact of size on the relation between profit and the various constituents of capital structure”.
  \item “There is no significant impact of sectoral differences on the relation between profit and the various constituents of capital structure”.
  \item “There is no significant relationship between profitability and leverage in general”.
  \item “There is no significant impact of size (sales-wise and income-wise) in influencing the relationship between profitability and leverage”.
  \item “There is no significant impact of sectoral difference in deviating the relationship between profitability and leverage”.
  \item “There is no significant relationship between non debt tax shield, collateral assets, growth as well as volatility and leverage”.
  \item “There is no significant relationship between capital intensity, aggressive investment policy, volatility, growth as well as size and profitability”.
\end{itemize}

\textbf{I.12 Methodology of the Study}

\textbf{I.12.1 Sources of Data and Period of the Study}

The study is based on secondary data, which are collected from Centre for Monitoring Indian Economy (\textit{CMIE}) Prowess package for a period of 10 years.
on year to year basis ranging from 1999-2000 to 2008-2009. The data for the food products manufacturing firms collected for the period are subject to limitations such as continuous listing for 10 years, availability of data for the years under study, and hence the final sample is restricted to 86 firms as shown in table I.3.

### Table I.3

**Food Product Firms Under Various Categories**

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Firms</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. <strong>Food Products</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy products</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Tea</td>
<td>213</td>
<td></td>
</tr>
<tr>
<td>Sugar</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Vegetable oils &amp; product</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Coffee</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Other products</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cocoa products &amp; confectionery</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>• Bakery products</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>• Processed / packaged foods</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>• Starches</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>• Marine food</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>• Poultry &amp; meat product</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>• Floriculture</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>• Milling products</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>• Other agricultural products</td>
<td>252</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>766</td>
<td>1572</td>
</tr>
<tr>
<td>II. <strong>Beverages &amp; Tobacco</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tobacco Products</td>
<td>35</td>
<td>175</td>
</tr>
<tr>
<td>Beer &amp; Alcohol</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>175</td>
</tr>
<tr>
<td><strong>TOTAL FIRMS IN FOOD INDUSTRY</strong></td>
<td></td>
<td>1747</td>
</tr>
</tbody>
</table>

*Source: CMIE (Centre for Monitoring Indian Economy) Prowess package as on 30th January, 2010.*
I.12.2 Sampling Design

*Multi-stage sampling technique* is used for the study and the different stages followed are mentioned below:

**Stage 1:** The total of 1747 food products manufacturing firms are reduced to 1572 since firms coming under Beverages & Tobacco categories are ignored as they occupy a negligible share (10%) of the total firms in food industry.

**Stage 2:** Out of 1572 food products manufacturing firms, 1314 firms are found to have details of incorporated year as on 30th January, 2010.

**Stage 3:** Among the incorporated firms, 309 are identified to have Bombay Stock Exchange (BSE) listing flag and 62 are having National Stock Exchange (NSE) listing flag. The NSE listed firms, being few in numbers are ignored, and BSE listed firms are taken into consideration for further stage.

**Stage 4:** Out of the 309 BSE listed firms, 99 firms are found to have continuously listed, based on BSE trading data availability, over the period of study.

**Stage 5:** Final sample constitutes 86 actively traded firms in BSE listing flag with availability of complete data required for the study for the study period.

I.12.3 Research Methods for Analysis

Descriptive statistics such as mean, median and standard deviation are used to neutralize the fluctuation in the value of explained as well as explaining variables. Correlation co-efficient is extensively used to study one-to-one relationship between the variables. Multiple regression is also used to study various variables that influence the debt ratio / leverage in a firm. Factor analysis is also used to determine the factors influencing $P$ and $CS$. Appropriate ratios as stated below are used to calculate individual relative properties of the selected variables.
## Table I.4
### Description of Ratios Used

<table>
<thead>
<tr>
<th>Variables</th>
<th>Description</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LEV_STD</strong></td>
<td>Short term debt/Book value of equity</td>
<td>A high value denotes high leverage in terms of short term debt and vice versa</td>
</tr>
<tr>
<td><strong>LEV_LTD</strong></td>
<td>Long term debt/Book value of equity</td>
<td>A high value denotes high leverage in terms of long term debt and vice versa</td>
</tr>
<tr>
<td><strong>LEV_TD</strong></td>
<td>Total debt/Book value of equity</td>
<td>A high value denotes high leverage in terms of total debt and vice versa</td>
</tr>
<tr>
<td><strong>VOL</strong></td>
<td>Standard deviation of earnings before interest, taxes and depreciation (EBITD) / Total Assets</td>
<td>A high value denotes greater volatility in earnings from the assets invested and vice versa</td>
</tr>
<tr>
<td><strong>COLASS</strong></td>
<td>Ratio of Property, Plant and Equipment / Total Assets</td>
<td>A high value denotes higher share of fixed asset to total asset, which implies greater share of assets is invested for increasing earning and vice versa</td>
</tr>
<tr>
<td><strong>NDTXSH</strong></td>
<td>Ratio of the sum of depreciation and amortization / Total Assets</td>
<td>A high value denotes a higher non debt tax shield and vice versa</td>
</tr>
<tr>
<td><strong>P</strong></td>
<td>PBITD/Fixed Assets</td>
<td>A high value denotes higher profitability in terms of fixed assets</td>
</tr>
<tr>
<td><strong>SIZ</strong></td>
<td>Logarithm of Sales over Years</td>
<td>Turnover adjusted for fluctuation over years</td>
</tr>
<tr>
<td><strong>AG</strong></td>
<td>Total number of years from the date of incorporation</td>
<td>The number of years the firm has been carrying out business</td>
</tr>
<tr>
<td><strong>GROW</strong></td>
<td>Compounded annual growth rate (CAGR) of total assets</td>
<td>The growth of total asset over years</td>
</tr>
<tr>
<td><strong>P_TASSET</strong></td>
<td>PBITD/ Total Assets</td>
<td>It indicates the return on assets invested. High value denotes large return on asset and vice versa</td>
</tr>
<tr>
<td><strong>P_SAL</strong></td>
<td>PBITD/Sales</td>
<td>It indicates the profit margin earned on turnover of firm. A high value implies a great profit margin and vice versa</td>
</tr>
<tr>
<td><strong>AIP</strong></td>
<td>Current Assets /Total Assets</td>
<td>It indicates the proportion of current assets to total assets. A low value indicates more aggressive use of assets for increasing earnings and vice versa</td>
</tr>
<tr>
<td><strong>CAPINS</strong></td>
<td>Total Assets / Sales</td>
<td>It indicates how intensively the assets are used to increase turnover. A low value indicates large turnover for the investment in assets and vice versa</td>
</tr>
</tbody>
</table>

*Source: Compiled from secondary sources*
I.13 Plan of Analysis

The analysis part is divided into two parts namely, preliminary analysis and core analysis. The preliminary analysis portrays the relation between profit before interest taxes and depreciation (\(PB\text{BITD}\)) and the various constituents of \(CS\), while the core analysis put to light the determinants of \(CS\) and \(P\).

I.13.1 Preliminary Analysis

The preliminary study analyses the relation between \(PB\text{BITD}\) and the various constituents of \(CS\) viz., short term debt (\(STD\)), long term debt (\(LTD\)), total debt (\(TD\)) and equity. The analysis aims at exploring the nature of impact of \(PB\text{BITD}\) on various constituents of \(CS\) in food industry in India. The impact of size, income and sector-wise differences are also portrayed in this part, which is considered to be the base for the core analysis, focusing the nature of relation between \(P\) and \(LEV\), hence the equation is:

\[CS = \alpha + PB\text{BITD} + \epsilon\]

I.13.2 Core Analysis

The core analysis is again subdivided into two parts namely (i) determinants of \(CS\) and (ii) determinants of \(P\). Regression equation I is formulated to study the determinants of \(CS\), and equation II is designed to study the determinants of \(P\). The impact of size and sector-wise differences on \(CS\) and \(P\) is also brought to light.

I.13.3 Regression Equation 1

Equation I attempts to study the determinants of \(CS\). The dependent variable \(LEV\) is studied under three heads viz., short term debt (\(LEV\_STD\)), long term debt (\(LEV\_LTD\)) and total debt (\(LEV\_TD\)). Hutchinson and Michaelas (1998)\(^{106}\) analyzed \(CS\) in terms of \(STD\), \(LTD\) and \(TD\). Titman and Wessel (1988)
also analyzed the implication with regard to different types of debt instruments viz. short-term, long-term and convertible debt rather than an aggregate measure of total debt, hence the equation is:

\[
LEV = \alpha + \beta_1 VOL + \beta_2 COL ASS + \beta_3 NDT XSH + \beta_4 P + \beta_5 SIZ + \beta_6 AG + \beta_7 GROW + \varepsilon
\]

I.13.4 Regression Equation II

Equation II is formulated to study the determinants of \( P \). The term \( P \) has been defined by Lowe, Naughton, and Taylor (1994) as the average rate of return on assets (ROA).

\[
P_{TASSET} = \text{PBITD}/ \text{Total Assets}
\]

Profit margin is also used as dependent variable to measure profitability.

\[
P_{SAL} = \text{PBITD}/\text{Sales}, \text{ hence, the equation is: }
\]

\[
P = \alpha + \beta_1 AIP + \beta_2 CAPINS + \beta_3 SIZ + \beta_4 GOW + \beta_5 VOL + \varepsilon
\]

I.13.5 Controlling Variables

Negative influence of \( P \) on \( LEV \) increases with the size of the firm (Rajan and Zingales 1995). Profitable large size firms have relatively less debt when compared to that of the smaller and riskier firms. Smaller firms tend to use significantly more short term debt than that of the larger firms (Titman and Wessel 1988). Debt capital decreases with higher \( P \) and \( SIZ \) in developing countries (Booth, Collins et al. 2001, Panday 2002, and Chen and Zhao 2004). To study the impact of size, the sample firms are grouped based on sales size and income size as detailed below:

Barton, Hill, and Sundaram (1989) proved the relativity of business as a determinant of \( LEV \). Bhattacharjee (2010) concluded that leverage varied across industries and between firms belonging to the same industrial sector. The sector wise impact is studied by grouping the firms into three sectors.
I.14 Limitations of the Study

- Analysis of the study is based on financing data collected from CMIE Prowess Package. The quality of the study depends purely upon the accuracy, reliability and quality of secondary data.
- The firms chosen are restricted to 86 due to limitations such as lack of continuous listing, non-availability of data pertaining to those firms in the data source.
- The sector-wise classification has grouped the firms into three sectors out of which the second and third sectors constitute related firms since there is more number of sectors with less number of firms.
- The firms of Beverages & Tobacco category are left out as they occupy a negligible share (only 175 out of 1747 of food manufacturing firms,
recording a share of 10%) and the nature of social concern of these firms also differs, hence firms categorized under food products alone are included in the study.

I.15 Chapter Design

The study consists of five chapters.

- **Chapter 1** gives a brief introduction of CS and P which brings to light the status of Food Industry in India. It also presents the research design of the study, wherein the problems of the study, the significance, scope, objectives, hypotheses, methodology, research methods for analysis, sampling design, period of the study, limitations, and chapter design are elaborated.

- **Chapter 2** presents review of literature related to the study.

- **Chapter 3** gives review of the concepts and theories of CS and P.

- **Chapter 4** is analysis chapter. It is divided into two parts (Part I and Part II). While Part I is the preliminary analysis, which attempts to study the relation between \( \text{PBITD} \) and various constituents of CS which forms the basis for the core analysis, Part II analyses the determinants of CS and P in terms of size and sectors.

- **Chapter 5** presents summary of findings and conclusion of the study. It also proposes appropriate suggestions and scope for future research.

I.16 Conclusion

Many researchers have tried to identify the variables that predict the debt level of corporate firms. The present study attempts to bring out the variables that determine the CS of food industry in India since agriculture is the livelihood of large portion of people in India. Moreover, India is the world's second largest producer of food next to China, and has the potential of being the biggest with the food and agricultural sector. India is not only one of the largest producers of food but also a large consumer which has led to difference in demand and supply resulting in food inflation that shook Indian economy to the core. Lack of proper infrastructural facilities also supplemented to the problem. The government has now felt the necessity for enacting National Food Security Act (NFSC) in order to provide a guarantee of adequate nutrition to all people. This Act mainly
focuses on food entitlements. This alone cannot efficiently solve the problem. Development of food industry would largely help in overcoming the problem. Growth should be supported by good researches and study about the financial aspects of that industry. Globalization and stiff competition have forced today’s corporate firms to determine that level of debt, which offers increased $P$ to the firm’s owners without unduly increasing the risk of insolvency. This is also an empirical work aiming at bring the food industry to light and to direct their growth in the right path. Review of past studies will be more helpful in identifying the gaps and to determine the objectives to be attained through this empirical work. The empirical and theoretical works are argued in comprehensively in the second chapter.
Chapter I
INTRODUCTION AND DESIGN OF THE STUDY

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