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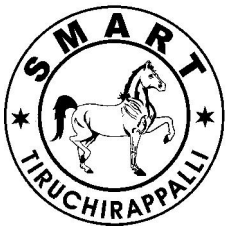


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# DETERMINANTS OF PROFITABILITY: A STUDY WITH REFERENCE TO INCOME SIZE-WISE ANALYSIS OF SELECTED FIRMS OF FOOD INDUSTRY IN INDIA

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***Abstract***

*Profitability (**P**) is the profit earning capacity which is a crucial factor in contributing to the survival of the firms. The perpetual existence of the firm depends on the profit earning capacity of the firm, which is also considered as the main factor in influencing the reputation of the firm. Further, the borrowing capacity of the firm is also determined by **P**. Thus, it is considered as the main factor in determining the capital structure of the firm. This paper is an attempt to study the impact of income size on **P**, considering the **"income"** as the control variable. For studying the impact of income earned on **P**, the selected firms of Food Industry are classified into three size categories viz., "low income", "medium income", and "high income" firms based on the Earnings Before Interest, Tax and Depreciation (EBITD) of the firm. The study proves that under the regression model 2 (after removing the predictor variable size **(SIZ)**) of low income firms), capital intensity (**CAPINS)** has significant positive coefficient (0.463) with **P,** while for medium income firms, growth (**GROW)** has significant negative coefficient (-7.515) with **P.** Also volatility (**VOL)** has negative coefficient (-10.416) with **P**. The regression model 2 of high income firms shows that **GROW** has significant negative coefficient (-7.515) with **P,** indicating that the increase in the asset could not impact the **P** of high income firms of Food Industry in India. Hence, $H_0^3$ and $H_0^4$ are rejected in the case of high income firms. Liquidity (**LIQ)** is, however, not significant for all the categories of income size.*

***Key Words:*** *Profitability **(P);** Volatility **(VOL);** Growth **(GROW);** Liquidity **(LIQ);** Capital Intensity **(CAPINS),** Return on Assets **(ROA),** Return on Investment **(ROI)***

## 1. Introduction

Profitability (***P***) is the profit earning capacity which is a crucial factor contributing to the survival of the firms. The perpetual existence of the firm depends on the profit earning capacity of the firm, which is also considered to be the main factor in influencing the reputation of the firm. The borrowing capacity of the firm is also determined by ***P***. Thus, it is considered as the main factor in determining the capital structure of the firm. ***P*** consists of two words, *profit* and *ability*. Therefore, it is necessary to differentiate between Profit and Profitability at this juncture.

***Profit***, from the accounting point of view, is arrived at by deducting from the total revenue of an enterprise all amount expended in earning that income whereas ***Profitability*** can be measured in terms of profit shown as a percentage of sales known as Profit Margin. It can also be expressed as R*eturn on Investment **(ROI)*** or R*eturn on Asset **(ROA)***. This study, in particular, uses ***ROA*** for determining ***P*** because sufficient *return on investment* in asset is essential for encouraging a growing industry like Food Industry as it is in the growing phase in India.

### 1.1 Significance of Food Industry in India

India is the world's second largest producer of food, next to China, and it has the potential of being the biggest under the Food and Agricultural Sector. The total food production in India is likely to 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 turnover of Food Industry is expected to reach $ 258 billion by the fiscal year 2015 and $318 billion by the fiscal year 2020 from the current level of $181 billion. Although India is one of the world's major food producers, it accounts for less than 1.5 per cent of international food trade. This is due to lack of adequate infrastructure facility in India.

Further, 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 also the food processing sector is also growing at a rapid rate to cater to the domestic needs and the export market. The Indian Food Industry is growing at over nine per cent per annum. The size of the Food Industry is as large as Rs. 4 lakh crores and has been growing fast. It is one-fifth of the US Food Industry, which accounts for $550 billion (Rs. 22 lakh crore). These facts indicate a wider scope for development of Food Industry in India. Therefore analyzing the determinants of profitability of these food industries becomes imperative.

### 1.2 Categories of Firms

The study concentrates on three income size categories of Food Industry comprising of Tea, Dairy and Vegetable Oil Firms. According to the National Sample Survey Organization (NSSO) on household consumer expenditure for 2007-08 (July-June), milk accounts for 14.9 per cent of the average rural family's spending on food and the figure stands higher, at 18.3 per cent for urban India. NSSO's consumption data is based on a comprehensive survey covering a sample of 31,673 rural and 18,624 urban households, spread over the entire country. India has also emerged as the world's leader in tea production, consumption and export. India's tea production accounts for 31% of global production. It is, perhaps, the only industry where India has retained its leadership over the last 150 years and India is also the largest oilseeds and vegetable oil producing country in the world but equally, it is the biggest consumer of vegetable oil.

## 2. Literature Review

***P*** is a crucial factor to judge the perpetual existence of a firm. A brief review of the past research works of experts in the field will help us understand the importance of the present study. ***P*** is considered to be an important factor in determining the Capital Structure (***CS***) of the firm. Different views prevail with regard to the relation between ***P*** and ***CS***. *Static trade off theory* works only to a certain extent but *pecking order theory* recognizes both asymmetric information and costs of financial distress. The works on asymmetric information also put production roughly in line with pecking order theory. Hence mangers follow the general rule, "issue safe securities before risky ones" **(Myers, S. C. 1984)**. The corporate managers are more likely to follow a financing hierarchy than to maintain a target debt- equity ratio **(Pinegar, M. J. *et al.* 1989),** which supports the pecking order theory. The regression result shows a negative relation between ***CS*** and ***P*** under market value basis and book value for both U.S. and Japanese manufacturing firms. There are no significant country differences in ***CS*** between U.S. and Japanese manufacturing after controlling the characteristics such as

growth, profitability, risk, size and industry classification **(Kester, C. W. 1986)**.

Another dimension of perception is that managers tend to avoid secured debt financing as it may increase the level of monitoring and may reduce their level of perquisites. Hence G*rowth Rates* ***(GROW)*** are negatively related to L*ong-Term Debt* (***LTD***). The Pecking Order Theory, which assumes that firms give more preference to retained earnings while deciding about financing a project, is also acceptable in this sense **(Titman and R. Wessels 1988)**. A higher, firm-specific, predicted Cost of Capital ***(CoC)*** lowers capital intensity. Predicted Capital Intensity ***(CAPINS)*** increases ***LTD*** in the firm's ***CS*** and predicted ***P*** decreases. Increased debt financing raises the firm's systematic rise **(Frederick H. De B. Harries 1994)**. ***P*** is inversely related to debt, while firm size as well as ***CAPINS*** are insignificantly inversely related to debt. However, the growth rate is positively correlated to debt **(Barton *et al.* 1988)**. ***P*** is positively associated with inside ownership and family portions of inside ownership. Performance determines ownership structure but not vice versa **(Chang, S. J. 2003)**. **Rajan, R. G. *et al.* (1995), Barton *et al.* (1988)** strongly supported the hypothesis that ***P*** is inversely related to debt. The data collected in US and European countries showed that more profitable the firm, lower the debt ratio, regardless of how the debt ratio is defined which is consistent with the *Pecking-Order Hypothesis* **(Booth, L. *et al.* 2001)**. Optimum ***CS*** enhances the ***P*** and the value of the firm. The results of a study on SMEs in India showed that they relied more on their own funds and comparatively less on borrowed funds **(Balramdogra *et al.* 2009)**. Therefore, it is recommended that more profitable firms should hold less debt since higher profit generates more internal funds **(Bevan *et al.* 2002).**

There are different perceptions about the impact of ***CAPINS*** and ***SIZ*** on ***P***. **Hutchinson *et al.* (1998)** showed that ***P*** did not affect the ***CS*** of small firms. ***CAPINS*** can affect ***P*** because cut-throat competition might eliminate all future profits, depressing each firm's security level **(Ghemawat *et al.* 1986)**. Their study proved that profits decline with ***CAPINS***. **Thomsen *et al.* (2000)** found that compared to other owner identities, financial investor ownership is found to be associated with higher shareholder value and ***P*** but lower sales growth. ***CAPINS*** imposes a greater degree of risk because assets are frozen in long lived forms that may not be easy to sell. Hence difference in ***CAPINS*** may be associated with difference in ***P*** **(Bettis, R. A. 1981).** Fluctuation in the profit earned by firms makes debt capital costlier. Consistent profit earning capacity is also looked into as a determinant of ***P***. Further, competitive market creates such a risk. In more competitive markets, ***P*** gets reduced due to higher cost of debt and thereby the chances of financial distress and bankruptcy also increase **(Pandey, I.M. 2002).** Profitable firms tend to issue more debt as debt capital may be available at a cheaper rate. The negative relations between ***P*** and ***Levarage*** ratios arise from firm's preference of internal funds over external funds and the availability of internal funds **(Chen, L. *et al.* 2004).**

## 3. Statement of the Problems

*Pecking Order Theory* and *Signaling Theory* have pointed out the importance of ***P*** in deciding ***CS***. A behavioral study of the managers of US firms shows that managers give more importance to projected cash flow from assets to be financed while making a financing decision. This shows that the ***P*** and ***Profit*** to be earned have significant influence on deciding the ***CS***. Pecking Order Theory and Signaling Theory have posited that the profitable firms use lesser ***LEV*** as they rely on internal funds. Thus, there exists a negative relation between ***P*** and ***LEV***. The studies of **Myers (1984)**, **Kester (1986),**

**Hasbrouch (1988), Friend & Lang (1988), Titman & Wessels (1988), and Chen *et al.* (2004)** provide empirical evidences in support of the negative relation between ***P & LEV***. **Long & Malitz (1985)**[26] pointed out that ***LEV*** increases with increase 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 ***CS & P***.

## 4. Objectives of the Study

- To analyze the factors that influence the profitability of a firm in Food Industry in India.
- To analyze the impact of income of firms on profitability of Food Industry in India.
- To study the deviation of the impact of determinants of profitability in respect of income size of firms in Food Industry in India.

## 5. Hypotheses of the Study

$H_o^1$ = "Liquidity of a firm does not have a significant impact on profitability of the firm".

$H_o^2$ = "Capital intensity of a firm does not have a significant impact on profitability of the firm".

$H_o^3$ = "Firm's volatility in earnings does not have a significant impact on profitability".

$H_o^4$ = "Growth of a firm does not have a significant impact on profitability".

$H_o^5$ = "Firm's size does not have a significant impact on profitability".

## 6. Methodology of the Study

### 6.1 Sampling Design and Technique

Multi-Stage Random Sampling Technique was used by adopting the following stages:

**Stage 1:** 1572 food products manufacturing firms were taken as the base data (population) and out of which firms coming under Beverages & Tobacco Categories were ignored as they constitute a negligible share of the total firms in Food Industry.

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

**Stage 3:** Among the 1314 firms, 309 firms were found to have BSE listing flag and 62 firms were having NSE listing flag. The NSE listed firms, being few in numbers, were ignored and therefore, BSE listed firms of 309 were taken into consideration for further analysis.

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

**Stage 5:** Out of 99 firms, only 87 firms displayed complete data for the period of study. Out of 87 firms, only 52 firms of three categories viz., 9 firms from Tea Sector, 11 firms from Dairy Sector, and 32 firms from Vegetable Oil Sector of Food Industry constituted the ultimate sample size, ignoring 37 firms of different categories with negligible numbers in each category of firms. Hence the final sample size was 52 firms only.

### 6.2 Sources of Data

The study was based on Secondary Data, which were collected from CMIE (Centre for Monitoring Indian Economy) Prowess Package as on 30th January 2010.

### 6.3 Period of the Study

The required data were collected for a period of 10 years ranging from 1998-1999 to 2008-2009. The data for the food products manufacturing firms collected for this period were subject to conditions such as continuous listing for 10 years and availability of data for the period under study.

### 6.4 Research Methods for Analysis

Descriptive Statistics such as Mean, Median and Standard Deviation were used to neutralize the fluctuations in the value of independent and dependant variables. Correlation Co-efficient was extensively used to determine the one-to-one relationship between selected variables. Multiple Regressions were also used to determine the various impact and control variables that influenced the ***P*** of a firm.

#### 6.4.1 Ratios of Independent Variables

***LIQ*** = The average Ratio of Cash and Marketable Securities to Total Assets

***CAPINS*** = Total Assets to Sales

***SIZ*** = Logarithm of Sales over Years

***GROW*** = Compounded Annual Growth Rate of Total Assets

***VOL*** = Standard Deviation of Earnings before Interest, Taxes and Depreciation (***EBITD***) divided by Total Assets.

**Controlling Variables**

For the purpose of measuring ***P,*** the control variable, *income earned,* was used. The firms were further grouped into three sub-categories viz., '*low income firms*' with profit (EBITD) < Rs.25 crores; '*medium income firms*' with profit > Rs.25 crores but < Rs.100 crores; '*high income firms*' with income >Rs.100 crores. The average income (***EBITD***) for a period of 10 years was taken for this purpose.

#### 6.4.2 Regression Equation

Regression Equation was fitted for the purpose of finding the factors determining ***P***. The term ***P*** has been defined (as the average rate of return on assets) by **Julian Lowe *et al.* (1994).**

**Dependant Variable**

The dependant variable is ***P,*** computed by using ***ROA*** Ratio.

***P*** was computed as ***ROA*** = Ratio of EBIT + Depreciation Charges to Fixed Assets **(Dianne, *et al.* 1995).**

**Independent Variables**

Liquidity **(*LIQ*)**

Capital-Intensity **(*CAPINS*)**

Size of the Firm (***SIZ***)

Growth in Total Assets (***GROW***)

Volatility (***VOL***)

**Equation:** $P = \alpha + \beta_1 LIQ + \beta 2\, CAPINS + \beta_3 SIZ + \beta_4 GOW + \beta_5 VOL + \epsilon$

### 7. Limitations of the Study

- Analysis of the study was based on financing data collected from CMIE Prowess Package and hence the quality of the study depends purely upon the accuracy, reliability and quality of secondary data.
- The analysis could not be extended to a longer period due to the problem of resources/ data availability.
- The sample firms chosen for the study were restricted to a small number due to limitations such as lack of continuous listing, non-availability of data of firms in the data source-Prowess Package.

**Analysis of Profitability of Firms of Food Industry in India**

### 8. Industry Analysis and Discussion

#### 8.1 Trend of *EBITD* of different categories of Firms under Food Industry in India

The **Chart - 1** shows the trend of income earned by the firms under the Food Industry. The trend line shows that income had risen to the peak in 2007-08 for *high income firms* and *medium income firms* while the income line seems to be flat for *low income firms* with no significant peaks or falls.

### 8.2 Overall Descriptive Statistics for Tea, Dairy, and Vegetable Oil Firms of Food Industry

Overall Descriptive Statistics (***Table 1***) reveals that ***CAPINS*** recorded higher mean value and their deviation was also higher. This shows that Food Industry probably did not block a fixed amount of capital in the form of long lived asset. Their investment in fixed asset kept on changing over the period of study, leading to a higher Standard Deviation when compared to other variables. The deviation from mean values for ***P, LIQ, SIZ, GROW*** and ***VOL,*** however, remained less than one, indicating that other variables fluctuated lesser than that of the ***CAPINS.***

### 8.3 Overall Correlation Matrix and Regression on Dependant Variable-Profitability

#### 8.3.1 Overall Correlation Matrix of selected variables on Profitability

The overall correlation matrix shows (***Table 2***) that the correlation between ***SIZ*** and ***P*** (0.426) was highly significant at 1% level. The ***SIZ,*** therefore, significantly influenced ***P*** and the positive correlation indicates that ***P*** increased with ***SIZ.*** There was significant positive correlation between ***GROW*** and ***P*** (0.351) at 5% level, which indicates that as the firm grew, the ***P*** also increased. However, ***CAPINS*** shows a negative correlation with ***P*** as pointed out by **Ghemawat, P. *et al.* (1986)** in their study. They suggested that ***CAPINS*** can affect ***P*** because cut-throat competition might eliminate all future profits, depressing each firm's net security level. ***LIQ*** and ***VOL,*** though not significant, recorded a positive correlation with ***P.***

#### 8.3.2 Overall Regressions of selected variables on Dependant Variable-Profitability

The Multiple Regression result shows (***Table 3***) that ***SIZ*** registered significant positive coefficient (0.136) with ***P,*** highlighting the significance of the impact of ***SIZ*** on ***P***. ***VOL*** shows a significant positive coefficient with ***P*** (1.067) at 5% level of significance, which does not match with the results of the study of **Pandey, I. M. (2002)** who pointed out that fluctuation in the profit earned might increase the cost of capital and thus reduce ***P***. However, this holds good for a well established industry, which has lesser challenges. Food Industry, being a growing industry, needs to take risk to earn more profit and hence this industry shows an abnormal positive relation between ***VOL*** and ***P***. The adj-$R^2$ also shows that the model was 21% fit and the F statistics was, however, highly significant at 1% level.

### 9. Impact of Income Earned (*EBITD*) on Profitability

### 9.1 Descriptive Statistics for Low Income, Medium Income and High Income Firms

The Descriptive Statistics of firms grouped on the basis of income earned, shows (***Table 4***) that ***CAPINS*** recorded maximum deviation from mean values for *low income firms* and *medium income firms,* indicating that there was high degree of variation in how intensively they used their asset for the purpose of earning income. *High income firms* recorded lesser deviation in ***CAPINS,*** showing that they were comparatively stable in utilizing the asset for the purpose of earning profit.

### 9.2 Impact of selected Variables in Low Income (*EBITD*) Firms on Profitability

The correlation matrix of the *low income firms* shows (***Table 5***) that ***GROW*** was highly significant and positively correlated (0.456) with ***P*** at 1% level of significance and ***VOL*** was also significantly positively correlated with ***P*** at 5% level of significance. In other words, the ***P*** increased with ***VOL*** in the case of *low income firms*. *Low income firms* faced more risk or they had to face more challenges in order to

increase ***P***. Growth in asset also increased the ***P*** of *low income firms*.

The Multiple Regressions of *low income firms* were studied by using two models **(*Table 6*).** Under model 2, ***SIZ*** recorded a higher Adj-$R^2$ when compared to *model 1*. *Model 2* shows that ***CAPINS*** recorded significant positive coefficient (0.463) with ***P*** at 5% level. ***LIQ*** registered negative coefficient while ***GROW*** and ***VOL*** recorded positive coefficient with ***P***.

### 9.3. Impact of selected Variables in Medium Income (*EBITD*) Firms on Profitability

The correlation matrix of *medium income firms* shows **(*Table 7*)** that ***VOL*** was significantly and positively correlated (0.723) with ***P*** at 5% level of significance. This shows that *medium income firms* also had to strive hard to increase the ***P*** as that of the *low income firms*. However, the other predictor variables recorded insignificant correlation with ***P***.

Multiple Regressions of *medium income firms* were studied under two models **(*Table 8*).** *Model 1* recorded higher $R^2$ (0.926) value and Adj-$R^2$ value (0.858) when compared to *model 2,* indicating that the regression model fit was >92%. But the predictors ***CAPINS*** and ***SIZ*** were removed to study the impact of other predictor variables on ***P***. *Model 2* shows that ***VOL*** recorded significant positive coefficient (18.205) with ***P*** at 5% level. ***GROW*** registered negative coefficient (1.516) with ***P*** at 10% level. In short, for *medium income firms*, the growth in asset could not contribute to an apparent increase in ***P***.

### 9.4. Impact of selected Variables in High Income (*EBITD*) Firms on Profitability

The correlation matrix of *high income firms* shows **(*Table 9*)** that there was negative correlation (0.823) between ***GROW*** and ***P,*** significant at 10% level. ***SIZ*** also was negatively correlated with ***P***. But the result was not quite significant. Hence it is found that the *high income firm's* increase in sales did not contribute to an apparent increase in ***P***.

The Regression *Models 1* and *2* **(T*able 10*)** have used two predictor variables, each removing the impact of other variables. The $R^2$ was also > 90 %, indicating that the model fit was good. The *model 2* shows that ***GROW*** recorded significant negative coefficient (-7.515) with ***P*** at 5% level of significance, while ***VOL*** registered negative coefficient (-10.416) with ***P*** at 10 % level.

## 10. Findings, Suggestions and Concluding Remarks

### Findings and Suggestions

The profit earned by firms was a major contributing factor to the ***P***. This study proposed to find out the impact of various predictor variables (viz., ***LIQ***, ***CAPINS, SIZ, GROW***, and ***VOL)*** on ***P*** when income earned was controlled. The results show that the firms, with varying income levels, were influenced by different determinants in deciding their ***P***.

The overall result shows that there was significant positive correlation between ***GROW*** and ***P*** (0.351) at 5% level, indicating that as the firm grew, the ***P*** also increased. However, ***CAPINS*** shows a negative correlation with ***P*** as pointed out by **Ghemawat *et al.* (1986).** Thus, the hypothesis $\mathbf{H_0}^4$ is rejected. The correlation between ***SIZ*** and ***P*** (0.426) was highly significant at 1% level, throwing light on the significant impact of ***SIZ*** in determining ***P*** of Indian Food Industry. Thus, $\mathbf{H_0}^5$ is rejected as ***SIZ*** has significant impact on the variables in determining ***P***. ***VOL*** also shows a significant positive coefficient with ***P*** (1.067) at 5% level of significance and this does not match with the outcome of the study of **Pandey (2002),** who pointed out that the fluctuation in the profit earned might increase the cost of capital, and thus reduce the ***P***. However, the statement holds good for a well established industry, which has lesser challenges. Food Industry, being a Growing Industry in India, needs to take risk to earn higher

profit. Thus, this Industry shows an abnormal positive relation between ***VOL*** and ***P,*** which leads us to reject the $\mathbf{H_o}^3$.

The income-wise analysis shows that in *low income firms,* ***GROW*** was significantly and positively correlated (0.456) with ***P*** at 1% level of significance and ***VOL*** was also significantly and positively correlated with ***P*** at 5% level of significance. Regression *model 2* (after removing the predictor variable-***SIZ***) of the firms shows that ***CAPINS*** recorded significant positive coefficient (0.463) with ***P*** at 5% level. Hence, $\mathbf{H_o}^2$ is rejected in the case of *low income firms*. Therefore, l*ow income firms* had to use their assets to the maximum to increase ***P***. In the case of *medium income firms*, regression *model 2* shows that ***GROW*** registered significant negative coefficient (-7.515) with ***P*** at 5% level of significance, while ***VOL*** recorded negative coefficient (-10.416) with ***P*** at 10 % level. Therefore, $\mathbf{H_o}^3$ and $\mathbf{H_o}^4$ are rejected in the case of *medium income firms*.

However, the Regression Model 2 of *high income firms* shows that ***GROW*** recorded significant negative coefficient (-7.515) with ***P*** at 5% level of significance, indicating that the increase in the asset could not impact the increase of the ***P*** of *high income firms*. ***VOL*** also recorded negative coefficient (-10.416) with ***P*** at 10 % level. Therefore, $\mathbf{H_o}^3$ and $\mathbf{H_o}^4$ are rejected in the case of *high income firms* as in the case of *medium income firms*. Hence ***GROW*** and ***VOL*** determined the ***P*** of *medium* and *high income firms*, while ***CAPINS*** was the significant major determinant variable of ***P*** in the case of *low income firms*.

## Conclusion

Thus, income decides the extent to which other predictor variables are related to ***P***. The $\mathbf{H_o}^1$, which assumes that ***LIQ*** has no significant impact on ***P*** of the firms of Food Industry in India, is accepted in all the categories irrespective of the level of income of the firms. The overall results also support the same.

## 11. Scope for Further Research

- The study was restricted to a few categories of Food Industry alone. Hence studies could be undertaken in other categories viz., sugar, coffee, and other products of Food Industry as well as in other industries too. A comparative study across industries can also be attempted.
- ***P*** was studied by the use of ratio of ***ROA***. For further studies, other profitability ratios can also be considered. Other than the predictor variables used in this study, age, exports, reliance on debt, employee productivity and managerial efficiency may also be used as predictor variables.

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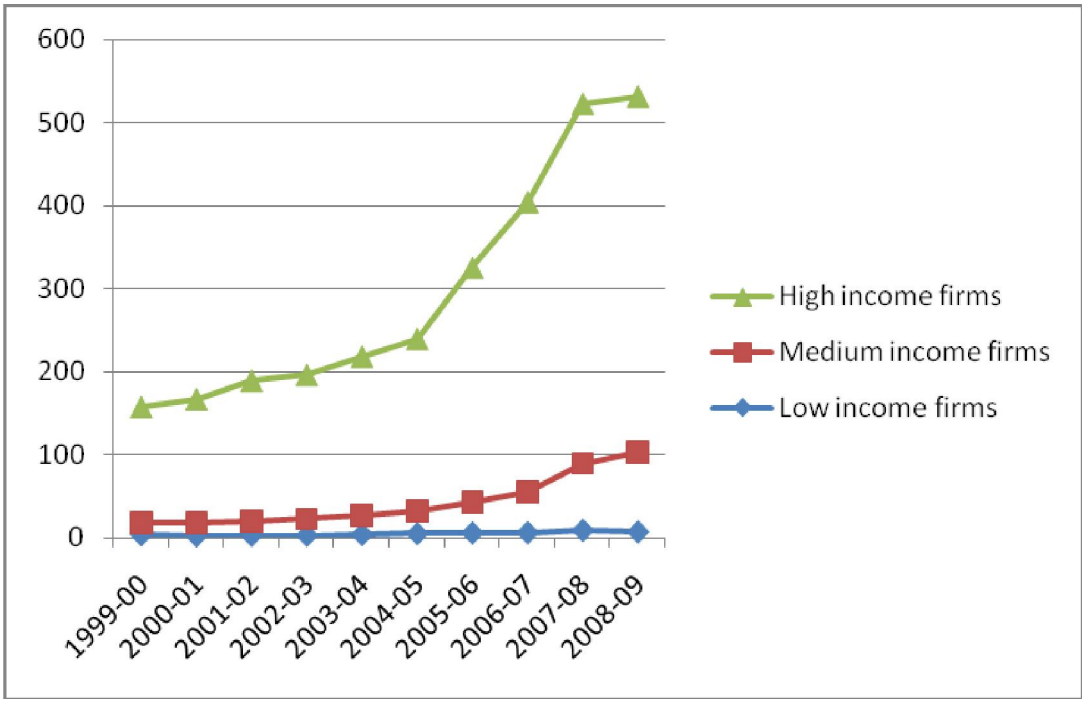
**Chart-1**
**Trend of *EBITD* of different categories of Firms of Food Industry in India**




Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

**Table - 1**
**Overall Descriptive Statistics for Tea, Dairy, and Vegetable Oil Firms of Food Industry**

| Variables | Mean | Std. Deviation |
|---|---|---|
| P | .320 | .314 |
| LIQ | .052 | .054 |
| CAPINS | 6.242 | 3.262 |
| SIZ | 1.965 | .938 |
| GROW | .096 | .122 |
| VOL | .066 | .087 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

**Table - 2**
**Overall Correlation Matrix for Tea, Dairy, and Vegetable Oil Firms of Food Industry in India**

| Variables | P | LIQ | CAPINS | SIZ | GROW | VOL |
|---|---|---|---|---|---|---|
| P | 1 | | | | | |
| LIQ | .082<br>.565 | 1 | | | | |
| CAPINS | -.178<br>.208 | -.039<br>.783 | 1 | | | |
| SIZ | .426**<br>.002 | .271<br>.052 | -.504**<br>.000 | 1 | | |
| GROW | .351*<br>.011 | .274*<br>.050 | -.202<br>.151 | .530**<br>.000 | 1 | |
| VOL | .184<br>.192 | -.161<br>.255 | -.055<br>.696 | -.157<br>.266 | -.213<br>.129 | 1 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

**Table - 3**
**Multiple Regressions on Predictors - Profitability**

| Variables | Un-standardized Coefficients Beta Value |
|---|---|
| (Constant) | -.068<br>(.574) |
| LIQ | -.229<br>(.765) |
| CAPINS | .001<br>(.551) |
| SIZ | .136<br>(.021*) |
| GROW | .585<br>(.138) |
| VOL | 1.067<br>(.027*) |
| $R^2$ | .288 |
| Adj-$R^2$ | .211 |
| F Stat | 3.728** |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

Note: The figures in parentheses are 'p' values
**significant at 0.01 level; *significant at 0.05 level

**Table - 4**
**Descriptive Statistics of Predictors for Low Income, Medium Income and High Income Firms of Food Industry in India**

| Variables | Low Income Firms | | Medium Income Firms | | High Income Firms | |
|---|---|---|---|---|---|---|
| | Mean | Standard Deviation | Mean | Standard Deviation | Mean | Standard Deviation |
| P | .234 | .240 | .388 | .251 | .875 | .359 |
| LIQ | .047 | .050 | .067 | .067 | .076 | .071 |
| CAPINS | 7.941 | 3.763 | 1.335 | 1.392 | .845 | .726 |
| SIZ | 1.695 | .902 | 2.502 | .312 | 3.208 | .313 |
| GROW | .067 | .110 | .208 | .136 | .152 | .062 |
| VOL | .077 | .097 | .032 | .017 | .039 | .024 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

**Table - 5**
**Correlations Matrix of Selected Variables of Predictors for Low Income Firms of Food Industry in India**

| | P | LIQ | CAPINS | SIZ | GROW | VOL |
|---|---|---|---|---|---|---|
| P | 1 | .181 | -.205 | .274 | .456** | .401* |
| | | .271 | .211 | .091 | .004 | .011 |
| LIQ | .181 | 1 | -.024 | .190 | .340* | -.131 |
| | .271 | | .886 | .247 | .034 | .427 |
| CAPINS | -.205 | -.024 | 1 | -.551** | -.205 | -.077 |
| | .211 | .886 | | .000 | .211 | .640 |
| SIZ | .274 | .190 | -.551** | 1 | .471** | -.061 |
| | .091 | .247 | .000 | | .003 | .711 |
| GROW | .456** | .340* | -.205 | .471** | 1 | -.166 |
| | .004 | .034 | .211 | .003 | | .314 |
| VOL | .401* | -.131 | -.077 | -.061 | -.166 | 1 |
| | .011 | .427 | .640 | .711 | .314 | |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.
Note: ** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

**Table - 6**
**Multiple Regressions on Predictors – Profitability (For Low Income Firms)**

| Variables | Un-standardized Coefficients Beta Value | |
|---|---|---|
| | Model 1 | Model 2 (after removing predictor variable *SIZ*) |
| (Constant) | -.131<br>(.914) | .360<br>(.425) |
| LIQ | -1.416<br>(.370) | -1.594<br>(.255) |
| CAPINS | .486<br>(.068) | .463<br>(.045*) |
| SIZ | .140<br>(.665) | - |
| GROW | .205<br>(.835) | .086<br>(.919) |
| VOL | 3.695<br>(.518) | 3.317<br>(.515) |
| $R^2$ | .771 | .759 |
| Adj-$R^2$ | .486 | .566 |
| F Stat | 2.701 | 3.937 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.
Note: The figures in parentheses are 'p' values
**significant at 0.01 level; *significant at 0.05 level

**Table - 7**
**Correlations Matrix of Predictors of Profitability of Medium Income Firms of Food Industry in India**

| | P | LIQ | CAPINS | SIZ | GROW | VOL |
|---|---|---|---|---|---|---|
| P | 1 | -.285 | .100 | -.319 | -.064 | .723* |
| | | .495 | .814 | .441 | .881 | .043 |
| LIQ | -.285 | 1 | -.278 | .576 | -.240 | -.623 |
| | .495 | | .505 | .135 | .567 | .099 |
| CAPINS | .100 | -.278 | 1 | -.872** | -.546 | -.044 |
| | .814 | .505 | | .005 | .162 | .917 |
| SIZ | -.319 | .576 | -.872** | 1 | .430 | -.312 |
| | .441 | .135 | .005 | | .288 | .452 |
| GROW | -.064 | -.240 | -.546 | .430 | 1 | .467 |
| | .881 | .567 | .162 | .288 | | .243 |
| VOL | .723* | -.623 | -.044 | -.312 | .467 | 1 |
| | .043 | .099 | .917 | .452 | .243 | |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.
Note: * Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

**Table - 8**
**Multiple Regressions of Predictors - Profitability (For Medium Income Firms)**

| Variables | Un-standardized Coefficients Beta Value | |
|---|---|---|
| | Model 1 | Model 2 (after removing predictor variables *LIQ* and *CAPINS*) |
| (Constant) | -2.221<br>(.454) | -.721<br>(.324) |
| LIQ | -.051<br>(.980) | - |
| CAPINS | .108<br>(.544) | - |
| SIZ | .847<br>(.446) | .339<br>(.245) |
| GROW | -1.633<br>(.213) | -1.516<br>(.069) |
| VOL | 21.803<br>(.098) | 18.205<br>(.017*) |
| $R^2$ | .926 | .903 |
| Adj-$R^2$ | .858 | .815 |
| F Stat | 2.424 | 5.879 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.Note: The figures in parentheses are 'p' values

**significant at 0.01 level; *significant at 0.05 level

**Table - 9**
**Correlations Matrix of Predictors of Profitability for High Income Firms of Food Industry in India**

| | P | LIQ | CAPINS | SIZ | GROW | VOL |
|---|---|---|---|---|---|---|
| P | 1 | -.702 | .803 | -.760 | -.823 | .178 |
| | | .186 | .102 | .136 | .087 | .774 |
| LIQ | -.702 | 1 | -.367 | .271 | .631 | .007 |
| | .186 | | .544 | .659 | .254 | .991 |
| CAPINS | .803 | -.367 | 1 | -.540 | -.402 | -.194 |
| | .102 | .544 | | .347 | .502 | .755 |
| SIZ | -.760 | .271 | -.540 | 1 | .602 | -.175 |
| | .136 | .659 | .347 | | .283 | .778 |
| GROW | -.823 | .631 | -.402 | .602 | 1 | -.675 |
| | .087 | .254 | .502 | .283 | | .211 |
| VOL | .178 | .007 | -.194 | -.175 | -.675 | 1 |
| | .774 | .991 | .755 | .778 | .211 | |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

**Table - 10**
**Multiple Regressions of Predictors – Profitability (For High Income Firms)**

| Variables | Un-standardized Coefficients Beta Value | |
|---|---|---|
| | **Model 1 (after removing predictor variables *LIQ VOL* and *SIZ*)** | **Model 2 (after removing predictor variables *LIQ CAPINS* and *SIZ*)** |
| (Constant) | 1.167<br>(.032) | 2.425<br>(.017) |
| LIQ | - | - |
| CAPINS | .279<br>(.092) | - |
| SIZ | - | - |
| GROW | -3.471<br>(.083) | -7.515<br>(.031*) |
| VOL | - | -10.416<br>(.097) |
| $R^2$ | .943 | .941 |
| Adj-$R^2$ | .887 | .882 |
| F Stat | 16.644 | 15.881 |

Source: Results of the outcome of the compiled data from CMIE data source for the years from 1999-00 to 2008-09.

Note: The figures in parentheses are 'p' values

**significant at 0.01 level; *significant at 0.05 level