IS LEVERAGE MAGNIFYING THE PROFITABILITY OF A COMPANY? 
(SOME FACTS ABOUT PAKISTAN’S FERTILIZER SECTOR)

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Abstract
Agriculture products are actually the backbone of any country in terms of their contribution in the growth and GDP directly or indirectly. Pakistan’s economy is also mainly depends upon the agricultural products. Agricultural products are solely depends upon the availability of their right ingredients like Urea and Pesticides. The production of the fertilizer companies always depends upon the availability of the financial resources. We have analyzed the availability of financial resources and their impact on the profitability. This study shows that debt source of financing has a positive impact on the profitability. Mainly the most importantly the companies should focus on the long term side of debt financing. This will magnify their returns. The data for past 10 years of Pakistan Stock Exchange (PSE) listed top fertilizer companies has been analyzed and the factual results are giving a positive indication regarding the impact of leverage on profitability.

Keywrods: Leverage, Profitability, ROA, ROE, GPM, NPM, TAT, CAT, FAT, TDTAR, TDCAR, TDFAR, CDTAR, CDCAR, CDFAR, FDTAR, FDCAR, FDFAR

Introduction:
Financial statement analysis is usually used to analyze the financial status of the company. Financial analysis of listed fertilizer companies of PSE will project its situation in today’s scenario. Pakistan is basically an agricultural country. This is the major sector of Pakistan. Because it contributes 24% of country’s GDP, almost half of population earning based on agriculture sector, major contributor in export, and growth rate of 3 to 4%. According to population size Pakistan stands among top six most populous countries that lead to huge food consumption. Fertilizer usage will increased food production. Fertilizers provide essential nutrients to the soil including potassium nitrogen proteins and phosphorus. This increased the productivity of land and ultimately increased food production. Fertilizer industry of Pakistan is central part of Pakistan economy. Fertilizer sector flourished during the era of green revolution in Pakistan in 1958. After that with the passage of time new plants and fertilizer companies were established. This study is based on the analysis of the financial statement leading 4 fertilizer companies which are listed on Pakistan Stock Exchange (PSE). These companies are Arif Habib Corporation (AHCL), Dawood Hercules (DAWH), Fauji
Fauji Fertilizer Corporation (FFC) and Fertilizer Bin Qasim Limited (FFBL). All major production of fertilizer including urea and ADP has been taken from these companies. So these are the key players of fertilizer industry. These 4 companies have more than 70% of the market share in that industry.

**Literature review:**

Financial ratios analysis is a method to find out position of a company in terms of its strengths and weakness as compared to the other companies in an industry. There are major five types of ratios that can be evaluated for the purpose of comprehensive analysis including efficiency, profitability, solvency, liquidity and market ratios (Memon & Tahir, 2012). For liquidity analysis mostly current ratio and quick ratio had been used and for fertilizer sector 1:1 considered to be good as this sector hold less liquid assets (Masood, 2014). Financial ratio analysis was better as compared to the other techniques because it is used to analyze the data of past years and make a comparison where the company stands over different periods that is also called trend analysis (Tirkey & Khilkhal, 2014). Ratios were related to each other some are direct and some had inverse relations. In the fertilizer and chemical industry the liquidity ratios were positively correlated to the ROA and ROE, while solvency ratios were inversely related with ROA and ROE (Khidmat & Rehman, 2014).

Financial ratio analysis was actually addressed all the stakeholders including creditors and shareholders, who wanted to see the pattern of fulfilling the liabilities as well as to see the earnings of the company. Actually shareholders wealth maximization (Tugas, 2012). A Study of fertilizer and oil and gas sector of Pakistan revealed that there exist positive relationship between ROE and profit margin with the corporate governance indicator included board size and annual general meeting and having negative relation for chief executive status and audit committee (Dar et al 2011). A study determined that ratio analysis also provided a comprehensive analysis about corporate governance and performance measurement of the companies. Financial analysis of non-financial companies of Pakistan suggested that capital structure of large companies consist of more debt than equity and it has an inverse relation with growth. Growing companies in Pakistan preferred more equity investment as compared to debt. Because studies suggested that profitable of firm has mostly greater equity investment then debt taken (Shah & Hijazi, 2004).

Eljelly (2004) says that to reduce the business risk and unrequired investment in assets and to be able to meet short term business commitments an organization should be able to calculate as well as forecast its liquid assets and liabilities. Liquidity of the company is calculated by dividing its short term assets to its short term liabilities. Liquidity of the company shows the amount available to the business to invest in the business and also for the expenses of the company. It also shows the amount available to meet long term and short term liabilities (Ross, 1977). A firm which own some extra amount of short term assets can increase the chance of internal funding which will further result in relationship between leverage and liquidity(S., 1977)(Bhunia, 2012)(Qureshi, 2012). A reasonable liquidity position has an impact on the financial position of the business (Zhao Bei, 2012) Many studies have proven a statistical relationship between leverage and liquidity (Harris, 1991)(Al-Najjar, 2011)(Al-Najjar B. T., 2008)(Eriotis N, 2007)(Rajan, 1995)(Sheikh NA, 2011)(Titman, 1988)(Qureshi1, 2012)

The financial structure of a firm of mostly profitable firms had positive relation between short term financing and ROE and profitability and an inverse relation between long term financing and profitability (Abor, 2005). Similar study revealed that financial analysis through ratio analysis had a significant importance and reliability. Financial ratio analysis is fundamental
analysis of profitability, equity and growth analysis. Because it tells about the past as well as predict future trends. Financial statement analysis basically considered the first thing to make future decisions and in this ratio analysis predict the future outcomes. (Nissim & Penaman, 2001).

Pakistan is basically an agriculture country. Major part of Pakistani earning is comprises of earning from the agriculture sector. After green revolution in Pakistan productivity of the crops increased due to the labor saving technologies and fertilizers which make soul better for crops.(Ali & Byerlee, 2002). Majority of the farmers in Pakistan had small farms therefore they needed fertilizers to increase productivity but could not afford high prices of fertilizers. Because it increased cost of production (Khan etal 2010).So financial analysis of fertilizer sector will predict the production, profitability, liquidity and solvency of the companies.

Methodology:
In order to find a relationship between leverage and profitability in the fertilizer sector in Pakistan, the data from these 4 PSE listed companies were gathered for the period of 10 years starting from 2006 to 2015. The detail of the methodology and data is given below:

Problem Statement:
The purpose of the study is to examine the performance of fertilizer industry in Pakistan and to find out the real opportunity in this field and to check out that whether the fertilizer firms safeguard the rights of their creditors or they are just exploiting their loans. Also to find out whether the existing of leverage in the financial statements of fertilizer firms are really magnifying their profitability or not.

Hypothesis:
H_0: There is no relationship of profitability and leverage in fertilizer industry.
H_1: Leverage decreases the profitability in fertilizer industry.
H_2: Leverage increases the profitability in fertilizer industry.

Aim of Study:
The aim of study is to provide necessary information to the creditors of the fertilizer industry. So that they may identify that the real position of the company to whom they are planning to grant some loan that whether that company really will be able to pay back their loan on due time or not. Also to identify that which king of loan is more important in the current era to be preferred.

Variables:
a. Dependent Variable:
   i. Profitability:
      It will be measured with the help following ratios:
      a) Gross Profit Margin (GPM)
      b) Net Profit Margin (NPM)
      c) Return on Assets (ROA)
      d) Return on Equity (ROE)
      e) Total Assets Turnover (TAT)
      f) Current Assets Turnover (CAT)
      g) Fixed Assets Turnover (FAT)

b. Independent Variable:
   i. Leverage:
      It will be measured with the help following ratios:
      a) Total Debts to Total Assets Ratio (TDTAR)
b) Total Debts to Current Assets Ratio (TDCAR)
c) Total Debts to Fixed Assets Ratio (TDFAR)
d) Current Debts to Total Assets Ratio (CDTAR)
e) Current Debts to Current Assets Ratio (CDCAR)
f) Current Debts to Fixed Assets Ratio (CDFAR)
g) Fixed Debts to Total Assets Ratio (FDTAR)
h) Fixed Debts to Current Assets Ratio (FDCAR)
i) Fixed Debts to Fixed Assets Ratio (FDTAR)

**Study Design:**
It is correlational as well as exploratory type study because here we have found the effect of leverage on profitability as well as we gave some important facts with reference to type of loan and type of assets based on the available data of the fertilizer companies.

**Study Population and Sampling:**
The population is the fertilizer companies in Pakistan. But for the purpose specific study top 4 public sector stock exchange listed companies are targeted for analysis. These companies are listed in Pakistan Stock Exchange (PSE). The sample interval is 10 years data from 2006 to 2015.

**Data Collection Methods and Instruments:**
The research study includes only secondary data which is taken from the Annual Financial Statements of the Fertilizer Industry. Data is extracted from the financial statement of 4 top ranked listed Fertilizer Companies in Pakistan.

**Data Analysis Methods:**
The data is analyzed in different ways by using two data analysis software Minitab and Stata. Firstly, we analyzed the cause and effect relationship between the leverage and profitability by using different regression techniques and secondly we use different graphics representation of the assets and liabilities to show their relationships over the past decade. For the former one we applied multiple regression technique as well as partial regression techniques for analysis. And for later we use different sort of charts to give a quick eye view of the important movements of different category of accounts. In the first stage, some basic ratio analysis techniques have been applied to find out the some basic results then in the second stage multiple regression model have been applied to find out within company effect and the whole industry effect because these companies holds more than 80% market share in Pakistan Fertilizer Sector. Then the individual and combined effects have been found.

**Schematic Diagram:**
Following is the schematic diagram of study:
Empirical Model:

a) Model 1:
In this model the impact of total debts with respect to different assets level on profitability will be measured.

i. \[\text{ROA} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

ii. \[\text{ROE} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

iii. \[\text{GPM} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

iv. \[\text{NPM} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

v. \[\text{TAT} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

vi. \[\text{FAT} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

vii. \[\text{CAT} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \epsilon\]

b) Model 2:
In this model the impact of current debts with respect to different assets level on profitability will be measured.

i. \[\text{ROA} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

ii. \[\text{ROE} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

iii. \[\text{GPM} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

iv. \[\text{NPM} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

v. \[\text{TAT} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

vi. \[\text{FAT} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

vii. \[\text{CAT} = \beta_0 + \beta_1 \text{CDTAR} + \beta_2 \text{CDCAR} + \beta_3 \text{CDFAR} + \epsilon\]

c) Model 3:
In this model the impact of fixed debts with respect to different assets level on profitability will be measured.

i. \[\text{ROA} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

ii. \[\text{ROE} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

iii. \[\text{GPM} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

iv. \[\text{NPM} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

v. \[\text{TAT} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

vi. \[\text{FAT} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

vii. \[\text{CAT} = \beta_0 + \beta_1 \text{FDTAR} + \beta_2 \text{FDCAR} + \beta_3 \text{FDFAR} + \epsilon\]

d) Model 4:
In this model the impact of total debts with respect to different assets level on profitability will be measured.

i. \[\text{ROA} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]

ii. \[\text{ROE} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]

iii. \[\text{GPM} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]

iv. \[\text{NPM} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]

v. \[\text{TAT} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]

vi. \[\text{FAT} = \beta_0 + \beta_1 \text{TDTAR} + \beta_2 \text{TDCAR} + \beta_3 \text{TDFAR} + \beta_4 \text{CDTAR} + \beta_5 \text{CDCAR} + \beta_6 \text{CDFAR} + \beta_7 \text{FDTAR} + \beta_8 \text{FDCAR} + \beta_9 \text{FDFAR} + \epsilon\]
vii. \[ CAT = \beta_0 + \beta_1 TDTAR + \beta_2 TDCAR + \beta_3 TDFAR + \beta_4 CDTAR + \beta_5 CDCAR + \beta_6 CDFAR + \beta_7 FDTAR + \beta_8 FDCAR + \beta_9 FDFAR + \epsilon \]

Results:
Model 1:
a) The regression equation is

\[ ROA = 4.31 + 26.3 TDTAR - 0.035 TDCAR - 8.16 TDFAR \]

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<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>Number of obs = 40</th>
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<tr>
<td>Model</td>
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<td>3</td>
<td>157.395346</td>
<td>F(3, 36) = 0.83</td>
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<tr>
<td>Residual</td>
<td>6867.98802</td>
<td>36</td>
<td>190.777445</td>
<td>Prob &gt; F = 0.4887</td>
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<tr>
<td>Total</td>
<td>7340.17405</td>
<td>39</td>
<td>188.209591</td>
<td>R-squared = 0.0643</td>
</tr>
</tbody>
</table>

|    | Coef.  | Std. Err. | t     | P>|t| [ 95% Conf. Interval] |
|----|--------|-----------|------|--------------------------|
| tdtar | 26.34219 | 18.99769 | 1.39 | 0.174 | -12.18692 to 64.8713 |
| tdcar | -0.0345664 | 0.4799445 | -0.07 | 0.943 | -1.007939 to 0.938062 |
| tdfar | -8.162717 | 8.972721 | -0.91 | 0.369 | -26.36024 to 10.03461 |
| _cons | 4.306997 | 5.014299 | 0.86 | 0.396 | -5.862472 to 14.47647 |

From the above model we can easily observe that only Total Debts to Total Assets Ratio (TDTAR) has a positive relationship with the Return on Assets (ROA). All other remaining variables have negative impact on Return on Assets (ROA).

b) The regression equation is

\[ ROE = 0.1 + 80.7 TDTAR + 0.06 TDCAR - 17.8 TDFAR \]

<table>
<thead>
<tr>
<th>Source</th>
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<th>df</th>
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<th>Number of obs = 40</th>
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<td>2064.52362</td>
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<tr>
<td>Residual</td>
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<td>36</td>
<td>879.98274</td>
<td>Prob &gt; F = 0.0891</td>
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<tr>
<td>Total</td>
<td>37872.9495</td>
<td>39</td>
<td>971.101269</td>
<td>R-squared = 0.1635</td>
</tr>
</tbody>
</table>

|    | Coef.  | Std. Err. | t     | P>|t| [ 95% Conf. Interval] |
|----|--------|-----------|------|--------------------------|
| tdtar | 80.6745 | 40.80134 | 1.98 | 0.056 | -2.074459 to 163.4235 |
| tdcar | -0.0634566 | 1.0307777 | -0.06 | 0.95 | -2.027055 to 2.153969 |
| tdfar | -17.80404 | 19.27071 | -0.92 | 0.362 | -56.88685 to 21.27878 |
| _cons | 1.137579 | 10.76921 | 0.01 | 0.990 | -21.70339 to 21.97854 |

From the above model we can easily observe that only Total Debts to Fixed Assets Ratio (TDFAR) has a negative relationship with the Return on Equity (ROE). All other remaining variables have positive impact on Return on Equity (ROE).

c) The regression equation is

\[ GPM = 27.1 + 6.0 TDTAR + 3.16 TDCAR - 3.5 TDFAR \]
From the above model we can easily observe that only Total Debts to Fixed Assets Ratio (TDFAR) has a negative relationship with the Gross Profit Margin (GPM). All other remaining variables have positive impact on Gross Profit Margin (GPM).

d) The regression equation is

\[ \text{NPM} = 31.4 - 14.0 \times \text{TDTAR} + 0.65 \times \text{TDCAR} - 3.4 \times \text{TDFAR} \]

From the above model we can easily observe that only Total Debts to Current Assets Ratio (TDCAR) has a positive relationship with the Net Profit Margin (NPM). All other remaining variables have positive impact on Net Profit Margin (NPM).

e) The regression equation is

\[ \text{TAT} = 12.1 + 2.3 \times \text{TDTAR} - 0.214 \times \text{TDCAR} - 8.65 \times \text{TDFAR} \]

From the above model we can easily observe that only Total Debts to Current Assets Ratio (TDCAR) and Total Debts to Fixed Assets Ratio (TDFAR) have a negative relationship with the
Total Assets Turnover (TAT). All other remaining variables have positive impact on Total Assets Turnover (TAT).

f) The regression equation is

\[ \text{CAT} = 148 - 464 \text{TDTAR} + 91.4 \text{TDCAR} + 7 \text{TDFAR} \]

The regression equation is

\[ \text{ROA} = 3.44 + 78.1 \text{CDTAR} - 0.137 \text{CDCAR} - 30.8 \text{CDFAR} \]

From the above model we can easily observe that only Total Debts to Total Assets Ratio (TDTAR) has a negative relationship with the Current Assets Turnover (CAT). All other remaining variables have positive impact on Current Assets Turnover (CAT).

g) The regression equation is

\[ \text{FAT} = 14.9 + 1.8 \text{TDTAR} - 0.347 \text{TDCAR} - 8.9 \text{TDFAR} \]

From the above model we can easily observe that only Total Debts to Current Assets Ratio (TDCAR) and Total Debts to Fixed Assets Ratio (TDFAR) have a negative relationship with the Fixed Assets Turnover (FAT). All other remaining variables have positive impact on Fixed Assets Turnover (FAT).

Model 2:
a) The regression equation is

\[ \text{ROA} = 3.44 + 78.1 \text{CDTAR} - 0.137 \text{CDCAR} - 30.8 \text{CDFAR} \]
From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) has a positive relationship with the Return on Assets (ROA). All other remaining variables have negative impact on Return on Assets (ROA).

b) The regression equation is

$$\text{ROE} = -1.02 + 249 \times \text{CDTAR} - 0.10 \times \text{CDCAR} - 91.6 \times \text{CDFAR}$$

From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) has a positive relationship with the Return on Equity (ROE). All other remaining variables have negative impact on Return on Equity (ROE).

c) The regression equation is

$$\text{GPM} = 30.2 - 26.2 \times \text{CDTAR} + 4.14 \times \text{CDCAR} + 11.7 \times \text{CDFAR}$$

From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) has a negative relationship with the Gross Profit Margin (GPM). All other remaining variables have positive impact on Gross Profit Margin (GPM).

d) The regression equation is

$$\text{NPM} = 30.1 - 53 \times \text{CDTAR} + 1.00 \times \text{CDCAR} + 14.5 \times \text{CDFAR}$$


From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) has a negative relationship with the Net Profit Margin (NPM). All other remaining variables have positive impact on Net Profit Margin (NPM).
e) The regression equation is

\[ \text{TAT} = 11.6 - 25.5 \text{CDTAR} - 0.347 \text{CDCAR} + 3.1 \text{CDFAR} \]

From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) and Current Debts to Current Assets Ratio (CDCAR) have a negative relationship with the Total Assets Turnover (TAT). All other remaining variables have positive impact on Total Assets Turnover (TAT).
f) The regression equation is

\[ \text{CAT} = 233 - 1485 \text{CDTAR} + 119 \text{CDCAR} + 365 \text{CDFAR} \]

From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) has a negative relationship with the Current Assets Turnover (CAT). All other remaining variables have positive impact on Current Assets Turnover (CAT).
g) The regression equation is
FAT = 14.2 - 40.3 CDTAR - 0.492 CDCAR + 10.7 CDFAR

From the above model we can easily observe that only Current Debts to Total Assets Ratio (CDTAR) and Current Debts to Current Assets Ratio (CDCAR) have a negative relationship with the Fixed Assets Turnover (FAT). All other remaining variables have positive impact on Fixed Assets Turnover (FAT).

Model 3:

a) The regression equation is

ROA = 11.5 - 14.4 FDTAR - 0.64 FDCAR + 3.7 FDFAR

ROE = 25.8 - 52.6 FDTAR - 2.75 FDCAR + 27.5 FDFAR
GPM = 28.4 - 75.1 FDTAR + 8.54 FDCAR + 41.2 FDFAR

\[ \text{NPM} = 24.7 - 29.5 \text{FDTAR} + 2.78 \text{FDCAR} + 8.9 \text{FDFAR} \]

From the above model we can easily observe that only Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Gross Profit Margin (GPM). All other remaining variables have positive impact on Gross Profit Margin (GPM).

d) The regression equation is

\[ \text{NPM} = 24.7 - 29.5 \text{FDTAR} + 2.78 \text{FDCAR} + 8.9 \text{FDFAR} \]

From the above model we can easily observe that only Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Net Profit Margin (NPM). All other remaining variables have positive impact on Net Profit Margin (NPM).

e) The regression equation is

\[ \text{TAT} = 7.89 + 19.1 \text{FDTAR} + 0.56 \text{FDCAR} - 21.8 \text{FDFAR} \]

From the above model we can easily observe that only Fixed Debts to Fixed Assets Ratio (FDFAR) has a negative relationship with the Total Assets Turnover (TAT). All other remaining variables have positive impact on Total Assets Turnover (TAT).

f) The regression equation is
From the above model we can easily observe that only Fixed Debts to Fixed Assets Ratio (FDFAR) has a negative relationship with the Current Assets Turnover (CAT). All other remaining variables have positive impact on Current Assets Turnover (CAT).

g) The regression equation is

\[ \text{FAT} = 11.4 + 20.5 \text{ FDTAR} + 0.11 \text{ FDCAR} - 26.2 \text{ FDFAR} \]

From the above model we can easily observe that only Fixed Debts to Fixed Assets Ratio (FDFAR) has a negative relationship with the Fixed Assets Turnover (FAT). All other remaining variables have positive impact on Fixed Assets Turnover (FAT).

**Model 4:**

a) The regression equation is

\[ \text{ROA} = 6.48 - 39.1 \text{ TDTAR} + 1.42 \text{ TDCAR} + 17.6 \text{ TDFAR} + 141 \text{ CDTAR} - 2.37 \text{ CDCAR} - 59 \text{ CDFAR} - 18.5 \text{ FDTAR} \]

\[ \text{ROA} = 6.48 - 39.1 \text{ TDTAR} + 1.42 \text{ TDCAR} + 17.6 \text{ TDFAR} + 141 \text{ CDTAR} - 2.37 \text{ CDCAR} - 59 \text{ CDFAR} - 18.5 \text{ FDTAR} \]
From the above model we can easily observe that Total Debts to Total Assets Ratio (TDTAR), Total Debts to Current Assets Ratio (TDCAR), Total Debts to Fixed Assets Ratio (TDFAR) and Fixed Debts to Total Assets Ratio (FDTAR) has a positive relationship with the Return on Assets (ROA). All other remaining variables have negative impact on Return on Assets (ROA).

b) The regression equation is

\[
\text{ROE} = 6.6 - 99 \text{TDTAR} + 1.88 \text{TDCAR} + 36 \text{TDFAR} - 406 \text{CDTAR} - 3.26 \text{CDCAR} - 153 \text{CDFAR} - 28 \text{FDTAR}
\]

From the above model we can easily observe that Total Debts to Total Assets Ratio (TDTAR), Current Debts to Current Assets Ratio (CDCAR), Current Debts to Fixed Assets Ratio (CDFAR) and Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Return on Equity (ROE). All other remaining variables have positive impact on Return on Equity (ROE).

c) The regression equation is

\[
\text{GPM} = 51.0 - 259 \text{TDTAR} + 6.65 \text{TDCAR} + 298 \text{TDFAR} + 433 \text{CDTAR} - 6.64 \text{CDFAR} - 410 \text{CDFAR} - 312 \text{FDTAR}
\]

From the above model we can easily observe that only Total Debts to Total Assets Ratio (TDTAR), Current Debts to Current Assets Ratio (CDCAR), Current Debts to Fixed Assets Ratio (CDFAR) and Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Gross Profit Margin (GPM). All other remaining variables have positive impact on Gross Profit Margin (GPM).
d) The regression equation is

\[ NPM = 56.2 - 245 \text{TDTAR} + 0.46 \text{TDCAR} + 311 \text{TDFAR} + 373 \text{CDTAR} - 1.11 \text{CDCAR} - 422 \text{CDFAR} - 325 \text{FDTAR} \]

From the above model we can easily observe that only Total Debts to Total Assets Ratio (TDTAR), Total Debts to Current Assets Ratio (TDCAR), Total Debts to Fixed Assets Ratio (TDFAR) and Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Net Profit Margin (NPM). All other remaining variables have positive impact on Net Profit Margin (NPM).

Total Debts to Total Assets Ratio (TDTAR)

e) The regression equation is

\[ TAT = 2.65 + 110 \text{TDTAR} + 1.58 \text{TDCAR} - 113 \text{CDTAR} - 216 \text{CDFAR} - 2.14 \text{CDCAR} + 170 \text{CDFAR} + 97.3 \text{FDTAR} \]

From the above model we can easily observe that only Total Debts to Fixed Assets Ratio (TDFAR), Current Debts to Total Assets Ratio (CDTAR) and Current Debts to Current Assets Ratio (CDCAR) has a negative relationship with the Total Assets Turnover (TAT). All other remaining variables have positive impact on Total Assets Turnover (TAT).

f) The regression equation is

\[ \text{CAT} = 104 - 1195 \text{TDTAR} + 229 \text{TDCAR} + 782 \text{TDFAR} + 1020 \text{CDTAR} - 205 \text{CDCAR} - 826 \text{CDFAR} - 850 \text{FDTAR} \]
From the above model we can easily observe that only Total Debts to Total Assets Ratio (TDTAR), Total Debts to Fixed Assets Ratio (CDTAR) and Fixed Debts to Total Assets Ratio (FDTAR) has a negative relationship with the Current Assets Turnover (CAT). All other remaining variables have positive impact on Current Assets Turnover (CAT).

g) The regression equation is

\[ \text{FAT} = 3.54 + 146 \text{TDTAR} + 1.33 \text{TDCAR} - 161 \text{TDFAR} - 299 \text{CDTAR} - 1.83 \text{CDCAR} + 246 \text{CDFAR} + 139 \text{FDTAR} \]

From the above model we can easily observe that only Total Debts to Fixed Assets Ratio (TDFAR), Current Debts to Total Assets Ratio (CDTAR) and Current Debts to Current Assets Ratio (CDCAR) has a negative relationship with the Fixed Assets Turnover (FAT). All other remaining variables have positive impact on Fixed Assets Turnover (FAT).

**Conclusion:**

Based upon the regression results, we can conclude that in order to increase the profitability fertilizer firms have to utilize the debt option for their financing. The main reason for this is that is considered as a cheaper source of financing as compared to equity financing on some reasons. The results of our survey are clearly showing that in model 1 TDTAR has always a positive relationship with any of the profitability indicators while in model 2 overall current debts looks more important because it is showing an inverse relationship with most of the indicators. So the companies should focus on the fixed portion of the debts rather than that of the current portion. In the Model 3 actually representing the capital structure of the fertilizer firm in the form of the proportion of their fixed assets with respect to their different debts level and comparing it with the different profitability indicators. It is also showing a positive impact of existing debts on...
profitability. In the last model no 4, we actually combine all debts indicators and check their impact on profitability in different ways. And it is also going to support our H1. So we can conclude that the leverage definitely has a positive impact on the profitability of the fertilizer firms. However what could the ideal capital structure, we can check it by using different models.

References:


