

An Empirical Analysis of Relationship between Capital Structure and Profitability

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ABSTRACT

the purpose of this study is to examine the tradeoff Theory of capital structure by Miller and Modigliani and the relationship of total assets with profitability. To process the research work the food and personal care sector of Pakistan Stock Exchange has been selected as the population. 30% of the population was taken as a sample for the study. So the six companies are selected, and five years annual reports are considered as a secondary data source. There are five variables in this study. Two variables are taken as explanatory and three variables as dependent. The explanatory variables are a debt to equity ratio to measure the changes in capital structure and total assets as whole a variable. The dependent variables are three which measures the profitability including return on equity, return on assets and a net profit of companies. Correlation matrix, descriptive statistics, and least square methods are used to analyze the data. Results approved the tradeoff theory, and it is proved that debt and assets have a positive relationship with profitability. In addition, the significance of the relationship varies with the measures of profitability

Keywords; *Capital Structure, Profitability, Debt to Equity Ratio, Total Assets, Return on Equity, Return on Asset and Net Profit*

1. INTRODUCTION

This article is basically concerned with profit in the context of capital structure. There are various influencing factors which positively or negatively impacts profit. They may be controllable or uncontrollable. Like government policies, the demand for the product, economic up-downs are uncontrollable factors. However, capital structure, cost, and expenses are somewhat controllable factors.

Many studies are conducted to know the impact of capital structure on the performance of the firm. In this regard, Miller and Modigliani theories gained very importance. These are MM irrelevance theory, MM trade off theory and MM pecking order theory. MM irrelevance theory assumes that in a perfect market there are no taxes, no transaction and bankruptcy costs, the symmetrical flow of information and equal borrowing cost. In such a case they said that capital structure is irrelevant to the firm value. In pecking order theory they said that internal financing is the best form of financing. Whether a company is financing through retained earnings or selling fixed assets, it sends a good signal to the public that the company is strong enough and self-sufficient. The third theory which is the tradeoff theory assumes that capital structure is not irrelevant to the firm's market value. The interest paid on debt is tax deductible; therefore; there are benefits to leveraging a firm until the optimal capital structure is reached.

The paper is based on the tradeoff theory. In this paper, the impact of leverage is checked on the profitability of firms, i.e., change in debt level changes the net profit and ultimately ROE or not? For this purpose, the food and personal care sector of Pakistan Stock Exchange is assumed as the population. There is a total of 21 companies. 30% of the population, i.e., 6 companies are randomly selected. Annual reports of these companies are used as the secondary data sources. Five years of data from 2011 to 2015 is considered for analyses.

2. LITERATURE REVIEW

The relationship between capital structure and profitability has been studied from previous research papers. Different types of opinions have been collected and are being presented here as a conclusion of these papers. A study of Jordan commercial banks is covering a ten year period of 2002-2011 regarding the relationship between financial decisions and performance namely return on equity. The return on equity is not affected by all the financial decisions of the Jordanian banks. Research on the industrial sector of Amman stock exchange in a similar area has been conducted by shubita and alsawalhah(2012). The results of the study said that profitability has negative relations with debt and positive relations with equity financing. The profit of firms also depends on

control variables, i.e., size and sales. In addition, a firm should use the optimal debt level to minimize the cost of capital and protect from bankruptcy.

According to Salawu and Awolowo (2009), the nonfinancial Nigerian firms have a positive relationship between short term debt and profitability. It is because 60% of the total debt consists of current liabilities in the case of Nigeria. The researchers also suggest that companies should maintain a capital structure which maximizes the firm's value. In other words, an optimal capital structure and a better credit policy can improve performance level.

Tariku negasa (2016) concluded that there is a significant positive relationship between total debt and profitability. The author researched 33 large scale private manufacturing firms of Ethiopia. In addition, excessive use of debt may lead to bankruptcy cost, so external financing is good to an extent.

Empirical analyses of capital structure and profitability of the non-financial SMEs in the UK by D.K.Y Abeywardhana (2015) reveals that capital structure is negatively related to the profitability provided that profit increases due to the size factor. SMEs of the UK believe that return is associated with risk. The author said that long term debt is not beneficial for firms because it increases the agency cost for firms; however short term debt is good and positively related to the profit of firms.

Kwame, Samuel & Emmanuel (2014) said that in Ghana companies are more profitable while using an internal source of finance and thus proved pecking order theory. Further firms depend more on short term financing. It is because there are no established bond markets in Ghana.

Evidence from the listed companies of Malaysia concluded by Mahfuzah Salim and Dr.Raj Yadav that performance is negatively affected by debt. Their study has three dependent variables, i.e., ROE, ROA and EPS and three independent variables, i.e., short term debt, long term debt, and total debt.

According to a research of Pakistan by Hassan Jan Habib, Faisal Khan and Dr. Muhammad Imran Wazir on the nonfinancial sector, debt has a significant negative relationship with profitability, thus confirming pecking order theory. Profit is positively correlated with control factors which are the parts of the study, i.e., size and sales growth. It has been concluded that debt is not preferable due to several reasons.

A case study of SMEs in Masvingo Urban concluded that productivity is positively related to debt financing. The level of debt financing must be moderate to avoid large interest payments which can prevent SMEs from investing using internal sources of finance. Research on sugar industries of Pakistan has concluded a positive relationship between financial leverage and return on assets. Further, the study conducted by Sara Sana and Heman Das on the textile industry of Pakistan concluded that the relationship between debt and return on equity is nonlinear. They said that the optimal ratio of debt financing is 56%, so the firms with approximately this ratio are growing ones, and excessive debt causes an increase in interest cost. The ROE increases up to the optimal debt level after which the decline comes. Moreover, size has no effect on ROE, but sales growth has a significant positive impact. Evidence from the French service sector elaborates that debt has no impact on profitability, either in a linear way or in a non-linear way.

3. RESEARCH OBJECTIVES

Following are the objective of the study

- ❖ To know the relationship between capital structure and profitability.
- ❖ To examine the tradeoff theory implications on the food and personal care sector of Pakistan, that interest is tax deductible.
- ❖ To investigate that with capital structure how total assets impacts on ROA, ROE and Net profit.

4. RESEARCH METHODOLOGY

There is a total of 21 companies listed in the food and personal care sector of Pakistan stock exchange. Random sampling technique applied. 30% of the population, i.e., approximately six companies are selected. Their names are National Foods Limited, Mitchell's Fruit Farms Ltd, Fauji Group Ltd, Quice Foods Ltd, Ismail Industries Ltd, and Engro Foods Ltd. Secondary data is used for the purpose of research. Audited annual reports of the six selected companies for five years from 2011 to 2015 are traced to find out the required figures. The debt to

equity ratio is an independent variable. The net profit, return on equity and return on assets are independent variables. Total assets are taken as a control variable.

4.1. RESEARCH HYPOTHESIS

H1; “ *The Return on Equity of food and personal care sector of Pakistan stock exchange increased due to an increase in debt to equity ratio from 2011 to 2015.*”

H2; “ *The Return on Assets of food and personal care sector of Pakistan stock exchange increased due to an increase in debt to equity ratio from 2011 to 2015.*”

H3; “*The Net Profit of food and personal care sector of Pakistan stock exchange increased due to an increase in debt to equity ratio from 2011 to 2015.*”

5. FINDINGS:

Findings are descriptive statistics, correlation matrix and least squares of ROA, ROE and

Net profit. Interpretation of statistical tools is given as under;

5.1 DESCRIPTIVE STATISTICS;

TABLE: 1.0

| TITLE | DTE | NP | ROA | ROE | TA |
|--------------|----------|----------|----------|----------|----------|
| Mean | 15.83733 | 6.561827 | 0.08395 | 1.611363 | 7.804963 |
| Median | 1.475 | 6.3503 | 0.0798 | 0.245 | 7.71335 |
| Maximum | 239.44 | 8.8059 | 0.1846 | 37.08 | 10.1546 |
| Minimum | -10.49 | 4.3236 | 0.0011 | -0.44 | 5.2834 |
| Std. Dev. | 49.86387 | 1.469314 | 0.05316 | 6.770119 | 1.568037 |
| Skewness | 3.591553 | 0.008964 | 0.214415 | 5.040609 | -0.12255 |
| Kurtosis | 15.40173 | 1.759144 | 1.973234 | 26.879 | 1.839703 |
| Jarque-Bera | 256.7499 | 1.925055 | 1.54768 | 839.7971 | 1.757956 |
| Probability | 0 | 0.381926 | 0.461238 | 0 | 0.415207 |
| Sum | 475.12 | 196.8548 | 2.5185 | 48.3409 | 234.1489 |
| Sum Sq. Dev. | 72105.77 | 62.60761 | 0.081955 | 1329.201 | 71.30344 |

5.2 CORRELATION MATRIX

TABLE:2.0

| | DTE | NP | ROA | ROE | TA |
|-----|----------|----------|----------|----------|----|
| DTE | 1 | | | | |
| NP | 0.123586 | 1 | | | |
| ROA | 0.073859 | -0.1856 | 1 | | |
| ROE | 0.877839 | 0.133021 | 0.257215 | 1 | |
| TA | 0.139849 | 0.944289 | -0.44804 | 0.067827 | 1 |

5.3 LEAST SQUARE METHOD

Dependent Variable: Return on Equity

Table:3.0

Method: Least Squares

Date: 04/09/17 Time: 10:38

Sample: 1 30

Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------|-------------|-----------------------|-------------|----------|
| C | -0.26864 | 0.726026 | -0.370014 | 0.7143 |
| Debt to Equity Ratio | 0.11915 | 0.01259 | 9.463565 | 0 |
| Total Assets | -3.36E-12 | 1.56E-10 | -0.02155 | 0.983 |
| | | | | |
| R-square | 0.770566 | Mean dependent var | | 1.611639 |
| Adjusted R-square | 0.753571 | S.D. dependent var | | 6.770064 |
| S.E. of Regression | 3.360769 | Akaike info criterion | | 5.356856 |
| sum square resid. | 304.9587 | Schwarz criterion | | 5.496976 |
| log likelihood | -77.35284 | Hannan-Quinn criter. | | 5.401682 |
| f- statistics | 45.34049 | Durbin-Watson stat | | 1.589366 |
| prob (f- statistics) | 0 | | | |

Dependent Variable: Return on Assets

Table: 4.0

Method: Least Squares

Date: 04/09/17 Time: 10:46

Sample: 1 30

Included observations: 30

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|----------------------|-------------|-----------------------|-------------|----------|
| C | 0.093246 | 0.011017 | 8.463717 | 0 |
| Debt to Equity Ratio | 3.54E-05 | 0.000191 | 0.185481 | 0.8542 |
| Total Assets | -4.93E-12 | 2.37E-12 | -2.084655 | 0.0467 |
| | | | | |
| R-squared | 0.14335 | Mean dependent var | | 0.08394 |
| Adjusted R-squared | 0.079895 | S.D. dependent var | | 0.053167 |
| S.E. of regression | 0.050999 | Akaike info criterion | | -3.0194 |
| Sum squared resid | 0.070223 | Schwarz criterion | | -2.87928 |
| Log likelihood | 48.291 | Hannan-Quinn criter. | | -2.97458 |
| F-statistic | 2.259065 | Durbin-Watson stat | | 1.73581 |
| Prob(F-statistic) | 0.123835 | | | |

| Dependent Variable: Net Profit | | | | |
|--------------------------------|-------------|-----------------------|-------------|----------|
| Table:5.0 | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| C | 7496642 | 6680144 | 1.122228 | 0.2716 |
| Debt to Equity Ratio | -1506.917 | 115843.8 | -0.013008 | 0.9897 |
| Total Assets | 0.041192 | 0.001434 | 28.7213 | 0 |
| | | | | |
| R-squared | 0.968674 | Mean dependent var | | 89906843 |
| Adjusted R-squared | 0.966354 | S.D. dependent var | | 1.69E+08 |
| S.E. of regression | 30922328 | Akaike info criterion | | 37.42649 |
| Sum squared resid | 2.58E+16 | Schwarz criterion | | 37.56661 |
| Log likelihood | -558.3974 | Hannan-Quinn criter. | | 37.47132 |
| F-statistic | 417.4554 | Durbin-Watson stat | | 0.990048 |
| Prob(F-statistic) | 0 | | | |

6. ANALYSIS

The results of the descriptive statistics are discussed individually. The values of mean, median, maximum, minimum ratios, profit, and total assets are given. The debt to equity ratio, return on equity data shows that distributions are highly positively skewed. The return on assets, total assets and a net profit of all companies throughout 5 years show that both are moderately skewed distributions. The standard deviation of debt to equity ratio shows that values are far from the mean of ratio. The standard deviations of net profit, total assets and return on assets are very low. However the std. dev. of return on equity is not too high; moderate deviations are there. The kurtosis of DTE and return on equity shows that the distribution is leptokurtic because the kurtosis is greater than 3, which is the kurtosis of the normal distribution. The kurtosis of return on assets, net profit, and total assets is less than 3 show them platykurtic distributions.

The correlation matrix shows the relationship between all the five variables. The Interpretation of Correlation Matrix is given as under.

Table: 6.0

| | DTE | NP | ROA | ROE | TA |
|-----|----------|-------------------|---------------|----------|---------|
| DTE | Perfect | | | | |
| NP | Possible | Perfect | | | |
| ROA | Possible | Possibly Negative | Perfect | | |
| ROE | Strong | Possible | Possible | Perfect | |
| TA | Possible | Strong | Negative Weak | Possible | Perfect |

The result of the least square method shows that there is a positive relationship between capital structure and profitability measured by debt to equity ratio and return on equity respectively. But the relation is insignificant because the value of the coefficient is very low. 1% changes in DTE causes 0.11% change in return on equity, so the 1st hypothesis is accepted. However total assets have a significant negative relationship with return on equity as shown by coefficient -3.36E-12.

The overall model fitness that is 27% showed by adjusted R-square, that highlighted the high explanatory power of the used model, indicating the presence of relevant variables in the model.

There is a strong positive relationship between capital structure and profitability measured by debt to equity ratio and return on assets respectively because the value of the coefficient is approximately 4 times. 1% changes in DTE causes 3.5% increase in return on assets. Therefore, the 2nd hypothesis is also accepted. However total assets have a significant negative relationship with return on assets as shown by coefficient -4.93E-12.

The overall model fitness that is 8% showed by adjusted R-square, that highlighted the low explanatory power of the used model, indicating the presence of irrelevant variables to some extent.

However there is a strong, too much elastic and negative relationship between debt to equity ratio and net profit because the value of the coefficient is very high; approximately -1507 times. 1% of changes in DTE causes 1507 times to decrease in net profit, so the 3rd hypothesis is rejected. The total assets have an insignificant positive relationship with net profit as shown by coefficient 0.041192.

The Adjusted R-squared showing overall fitness of the model is 97%, it indicated that the explanatory power of this model is very strong and sufficient variables are included in the model.

7. CONCLUSION:

The current study focuses on the impact of capital structure on profitability. In this article Debt to equity ratio is supposed to be an explanatory variable. And dependent variables including ROE (Return on equity), ROA (return on assets) and NP (net profit). Total assets as a control variable. The statistical findings are descriptive statistics, correlation matrix and least squares methods interpreted in the analysis section. The conclusion of the article has been drawn as under;

- A strong positive relationship between ROA ratio, ROE ratio, and Net profit is showing in a correlation matrix.
- The least square method is showing the insignificant positive relationship (when the return on equity is dependent) that DTE ratio with ROE (return on equity) and on the other side a significant negative relationship of total assets with return on equity can be seen.
- The least squares method shows (when the return on assets is dependent) that there is a strong positive relationship between debt to equity ratio and return on assets and total assets have a significant negative relationship with ROA.
- When net profit is considered dependent the result shows that net profit is very elastic and has a negative relation with DTE ratio. The total assets have an insignificant positive relationship with net profit.

Thus the results of the study are enough to conclude that capital structure decisions positively influence the profitability of food and personal care sector of Pakistan stock exchange provided that the degree of relationship is changing with different measures of profitability. This study approves the tradeoff theory by Miller and Modigliani.

8. RECOMMENDATIONS:

In the light of this study, I would like to recommend that this study is in the context of Pakistan food and personal care sector, further research should be made in different sectors to enhance and specify the impact of capital structure on profitability. It is proved that debt increase ROA and ROE. But why it shows a negative impact on the net profit, it should be researched further.

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