

## **Financial Mix and Profitability: Evidence from Small-Medium Sized Food Manufacturing Firms**

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### **Abstract**

The Financial Mix and profitability indicators are important from firm's financing decision point of view because there exists functional dependence among them. Any change in Financial Mix (Capital-Structure) may bring change in profitability indicators. Therefore, the study aimed to analyse the impact components of Financial Mix on profitability indicator of food manufacturing firms operating in Pakistan. Secondary data is collected for sixteen firms for ten years 2010 to 2019 about financial mix: debt to total capitalization, debt to equity, and debt to total fund were considered as independent variables while return on equity has considered as dependent variable. Panel data models are used to estimate the data. The analysis shows that debt to equity and total capitalization have significant impact on return on equity while debt to total fund has insignificant impact on the return on equity of the firms. The author suggested that debt to equity and total capitalization are more important variables to affect the return on

equity but debt to total fund have no impact on return on equity of food sector firms.

**Key Words:** Financial Mix; Debt; Equity; Performance

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## 1. Introduction

Capital structure is the most important from the firm's conduct, performance and profitability point of views. The Financial Mix may comprise of preference share, common share and long terms debt. Firms take decision how much equity and how much debt should be for financing the projects. The pie of the equity capital and debt-financed capital, which is invested in firms, is known as capital structure (Van Horne, 1995). The firms prefer to raise capital by issuing ordinary or preferred shares instead of obtaining loan. However, some firms prefer to

finance their investment and operation by short terms and long terms loans. The firms, which prefer debt financing, argue that interest on borrowed funds may be less than cost of equity financing.

The firms may claim tax rebates that make able to residual for stakeholders. More versatile the capital structure greater will be the retained earnings (Baker & Wurgler, 2002). To stay competitive in the market, various firms may exercise this tool. The variability in profits may be the result of any variation in the capital-structure. Lower variations in profitability of the firms reflect optimal input combinations of various elements of capital structure. No matter firms, finance their operations by issuing shares or getting loans (Muhammadzadeh et al, 2013). Because the profitability is affected by capital structure, so a rational decision is necessary for capital structure. The core purpose of the current investigation is to identify whether capital-structure brings positive changes in return on equity of small and medium sized food manufacturing companies listed at PSX

## **2. Literature Review**

Ebrati et al. (2013) examine the consequences of firm's financial mix on the company's financial performance. To see the estimation of impact multiple regression tool is adopted in study. Six years data is taken from listed firms of TSE (Tehran stock exchange). The data of 85 firms are taken as a sample. Assets returns and equity returns are taken as proxy of performance. The results reveal significant relationship between financial mix and ROE, while insignificant relationship between financial mix and ROA. From construction sector of Malaysia, (San & Heng, 2011) investigate the relationship between capital structure and performance of the firm. Using a period of financial crisis, they observed a significant and positive relationship between EPS (earning per share) and returns on capital. Olayiwola (2014) investigate the companies listed at Nigerian stock exchange. For the purpose to examine the capital structure and profitability, 70 firms are selected as a sample over the period from 2000-2009. To achieve the objective, Hausman specification test is applied to distinguish fixed from random effect models. The results of the study state that profitability has been affected by the capital structure.

Firms listed at Aman stock market are selected by (Soumadi & Hayajneh, 2012) to explore the relationship between financial mix and performance. Seventy-six

industrial and services firms are taken over the period from 2001 to 2006. Ordinary least square technique is employed to investigate the connection between both constructs. The findings conclude that capital structure and firm profitability negatively associated with each other. Memon et al. (2012) examine the textile sectors firms of Pakistan that either financial mix has any influence on the firm's profitability. Data is taken from balance sheet analysis, which is issued by state bank of Pakistan, and the periods of the study is taken from 2004-2009. The results through linear regression indicate the significant relationship between financial mix (debt-equity) and return on assets (profitability). From national stock exchange of India, Goyal (2013) identifies relationship between financial mix and profitability. A data set of five-years is taken for the study purpose ranges from 2008 to 2012. The findings suggest a positive and significant relationship between EPS (earning per share) and short-term debt, while same results are found for ROE and ROA. From stock market of Tehran, (Pouraghajan et al., 2012) elaborate the influence of financial mix on firm's performance. Data of 400 firms is taken to analyze the impact over the period of 2006-2010. Measure of the financial performance was ROE and ROA. Debt ratio shows a negative association with company's financial-performance and positive significant influence of financial mix on performance of firm which is measured through assets tangibility ratio, firm size and assets turnover. The findings reveal that management can grow shareholder wealth and financial performance through decreasing the debt ratio.

Warad (2013) investigates whether profitability is affected by leverage or not. Gross (GPM), net (NPM) and operating (OPM) profit margin, ROE and ROA are used as profitability measures while debt ratio and equity ratio are expressing the leverage. By using multiple regressions over the period of 2008-2011, the results state that there is high gross profit margin of medical and pharmaceutical firms and the gross profit margin of ceramic and glass firms is lowest. Finally, the study concludes that profitability has significant positive relationship with debt. Ahmad et al. (2012) examine the relationship between capital structure and firm's performance. Malaysian firms are selected containing 358 observations over the period of 2005 to 2010. They conclude that only asset returns and equity return have been influenced by short term debt and total debt. Aghaei, Momeni and Fakhraei (2014) elaborate the relationship between the firms' profitability and debt of the firms which are listed in Tehran stock exchange. They analyze the annually data for this purpose over a longer period. Panel data GLS regression co-efficient approach is used by author for the investigation. They

find short term debt and profitability has positive relation while long term debt and profitability has negative association with each other. Using the data of 21 chemical sector firms listed at Pakistan stock exchange, Shahid et al. (2016) identifies the relationship between capital structure and ROE. They find significant-positive relationship between the debt component in the capital structure and ROE (performance). Through a literature survey, Israr-un-Nabi (2017) finds insignificant relationship between capital structure and performance of the firm. By taking data of 58 firms from cement industry of Pakistan, (Shahid et al., 2018) investigate the relationship between capital structure and Return on Equity (ROE). Using GLS Model (Generalized least square) and fixed-random effects, they find significant and negative relationship between the capital structure and performance of the firm. Sabir et al. (2019) select bankrupt companies from textile sector and find cashflows, debts and profitability predict the financial failure and performance of the firm. Shahid et al. (2020) identify the mediating role of working capital between corporate governance & performance of the firm and find that working capital mediates the said relationship. In general companies listed at Pakistan stock exchange shows levels of profitability (Shahid et al., 2017) which can be captured via component of capital structure.

After reviewing the literature, theoretical framework of the study is developed to represent the impact of capital structure on return on equity. It represents the impact of independent variables (debt to total fund, debt to equity and total capitalization) on the dependent variable (return on equity) in pharmaceutical sector firms of Pakistan. The association between independent and dependent variable is estimated through panel data models; like random affect model and fixed affect model. E-views software is used analyze the data.

Profitability is the ability to generate earning to compensate the expenses and other costs of firms during the specific period of time (Duyen, 2012). From profitability indicators, return on equity (ROE) is taken as dependent variable. ROE means how much amount a firm generated through the money which is invested by shareholder (Horne, 1995) and is specified as;

$$\text{Return on Equity (ROE)} = \frac{\text{Earnings Available for Common Stockholder}}{\text{Common Stock Equity}} \dots\dots\dots 1$$

Capital structure mix is very important from financing point of view. The firm may finance it with equity, debt or combination of both variables. Instead of

taking variables in absolute form, the ratios of above-mentioned variables considered for prudent policy decision. Debt to total fund, Debt to equity and total capitalization are considered more important among capital structure variables (Hughes, 2013). Debt to equity ratio shows what is the proportion of debt and equity for financial operations of firms. High debt to equity ratio means that the firm is aggressive for growth through debt financing Horne (1995) and debt to equity ratio is specified as;

$$\text{Debt to Equity (DE)} = \frac{\text{Total Debt}}{\text{Shareholder's Equity}} \dots\dots\dots 2$$

Debt to total funds shows the proportion of debt and total fund invested by the firms Horne (1995) and is specified as;

$$\text{Debt to Total Fund (DTF)} = \frac{\text{Total Debt}}{\text{Total Assets}} \dots\dots\dots 3$$

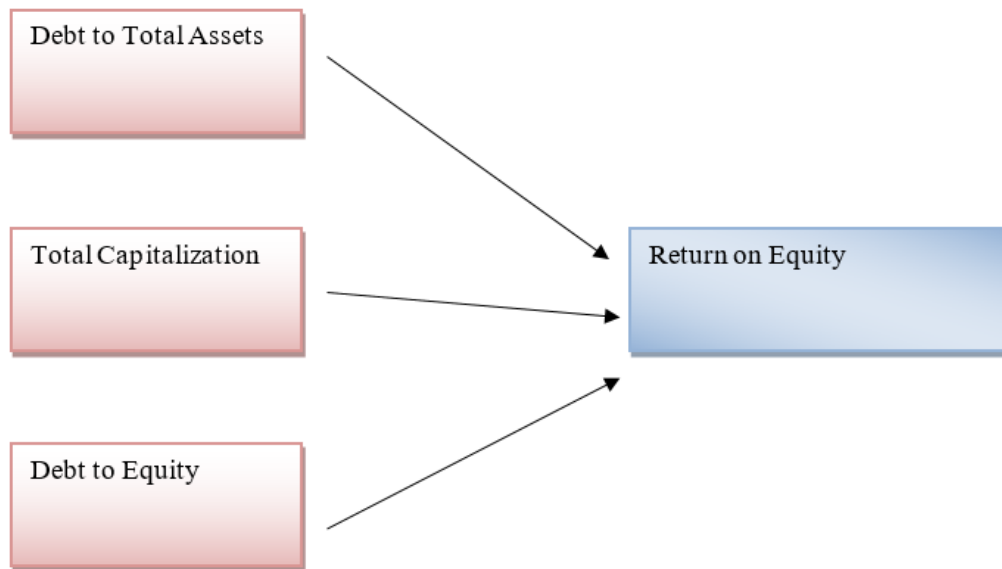
Total capitalization means the proportion of total debt from long term debt and equity Horne (1995) and is specified as;

$$\text{Total Capitalization (TC)} = \frac{\text{Total Debt}}{\text{Long Term Debt} + \text{Equity}} \dots\dots\dots 4$$

The study is having the following hypotheses;

**H0:** Capital structure does not have any relationship with return on equity.

**H1:** Capital structure has significant relationship with return on equity.



**Figure 1:** Model of the Study

### 3. Research Methodology

The return on equity (ROE) can be expressed as function of debt as proportion to assets, debt as proportion to equity and total capitalization;

$$ROE_{it} = \alpha_i + \beta_1 DTA_{it} + \beta_2 DTE_{it} + \beta_3 TC_{it} + u_i + v_{it} \dots\dots\dots 5$$

To check whether fixed effect or random effect is more useful, the Hausman test is used. Hausman test uses the assumption that random effects are more consistent than fixed effects. If the null hypothesis of randomness is rejected, fixed effect model must be preferred for analysis. Otherwise, parameters will be biased and inconsistent (Malik et al., 2020).

#### 3.1. Data Sources and Issues

Secondary data is collected for the purpose of this study. According to Niresh, (2012) “secondary data is data that have been previously collected for some other projects rather than the one at hand but found useful by the researcher”. The main data source is the firm’s financial reports, website of related firms and website of SBP (State Bank of Pakistan).

The data of relevant variables is collected from profit and loss account and balance sheet of the firms. For the purpose of study manufacturing sector is chosen. Sixteen firms of food sector are selected randomly. Ten years data of relevant firms is taken from 2010-2019. It became 160 observations for the process of panel data. The data which is collected for the purpose of study is reliable because it is collected from the financial statement of the firms which is audited from external auditor and the website of state bank of Pakistan.

#### **4. Empirical Results**

This section comprised of empirical estimation of the model used in the study. There are fundamentally three equations to be estimated with panel data techniques. The estimated results and their validity are discussed in the following paragraphs.

In equation return on equity are taken as dependent variable and as an independent variable debt as proportion to equity, total capitalization and debt as proportion to total fund were taken. Panel data estimates in equation that debt as proportion to equity has significant impact on equity return (ROE). Panel estimates reveal that increase in debt to equity by one dollar brings increase in return on equity by 2.21dollars. 3.31 dollars change in return due to change in debt to equity in random effect. The total capitalization has also significant impact on the returns. The 1.19 dollars and 1.41 dollar increase due to per dollar increase in total capitalization under fixed effect and random effect model respectively. Debt to total fund is not important in respect of profitability point of view because debt to total fund is insignificant in fixed effect and random effect model.

In equation the Hausman test results suggest that the random effect model is more robust. Regression results also quite satisfactory by the Durbin Watson and F-stat. The other measures like confidence Ellipse, Normality of residuals and co variance also show that the results are correct. Finally, it is found that debt to equity and total capitalization is significant and have impact on the profitability of firms but debt to total fund is insignificant and has no impact on profitability.



*4.1. Estimation of Equation: Effects of Capital Structure on Equity return (ROE):*

The outcomes of fixed effect model are shown in Table 1 which indicate that DE (debt to equity) and DTF (debt to total funds) have insignificant while TC (total capitalization) has significant relationship with Return on Equity. R-square shows that 60 percent variations in profitability of firm (ROE) is explained by the independent variables (DE, DTF, TC). The value of Durbin-Watson negates any autocorrelation in error term because the value of Durbin Watson is 2.53. The overall model is statistically significant (as F-stat = 0.000). It depicts that fixed effect model is satisfactory.

**Table 1:** Panel Least Square-Fixed Effect Model Estimations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	21.90582	7.635827	2.868820	0.0048
DE	2.218211	1.432430	1.548565	0.1237
DTF	-11.70963	9.961971	-1.175433	0.2418
TC	1.199238	0.228197	5.255272	0.0000
R Squared	0.606466	Durbin-Watson	2.530204	F-stat 0.000

*Source: Author Estimates with Eviews*

Table 2 shows results of random effect model indicating insignificant relationship between of debt to total fund and ROE as (p-value= 0.28). The other two variables debt to equity and total capitalization show significant and positive relationship with returns on equity. The other measures of the random effect model are also satisfactory. The measure coefficient of determination shows that 28 percent changes in return on equity are explained by capital structure variables like DE, DTF and TC. The value of Durbin-Watson is close to 2.13 which shows no autocorrelation in error term. The overall model is statistically significant (as F-stat = 0.000). It shows that fixed effect model is suitable for the model.

**Table 2:** Panel Least Square-Random Effect Model Estimations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.21762	7.182115	2.397291	0.0177
DE	3.319780	1.276394	2.600905	0.0102
DTF	-9.292584	8.593927	-1.081297	0.2812
TC	1.414083	0.209090	6.763039	0.0000
*R Squared	0.281875	*Durbin-Watson	2.130510	*F-stat 0.000

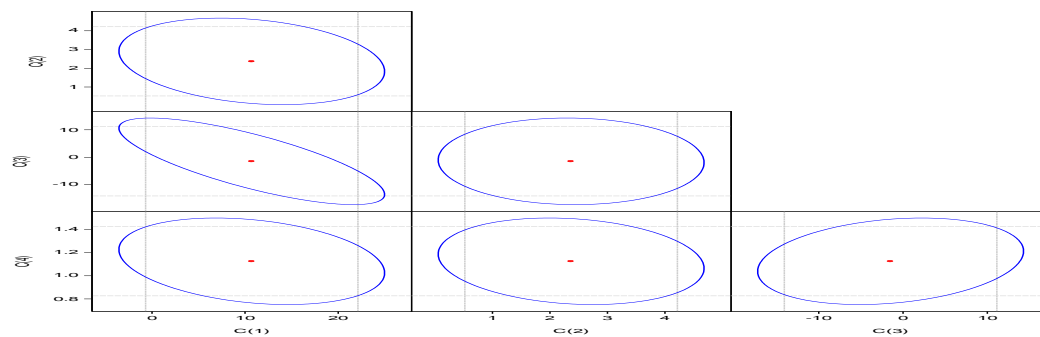
\* Weighted Statistics, Source: Author Estimates with Eviews

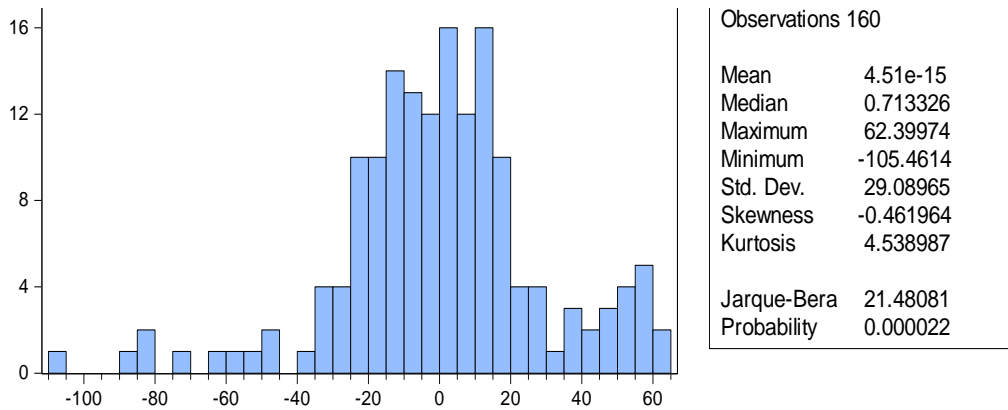
Table 3 depicts regression output of Hausman test. Chi-square statistics turned to 18.39 with p-value of .0004 percent. If we consider exact level of significance (5 %), then the null of randomness is not rejected and fixed effect model should avoid for further decision policy implications. Therefore, Hausman favors the estimates of fixed effect are robust, consistent and unbiased.

**Table 3:** Correlated Random Effects - Hausman Test of Equation

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.392948	3	0.0004

Source: Author Estimates with Eviews

**Figure 2:** Coefficient Diagnostics: Confidence Ellipse of Equation 5

**Figure 3:** Normality test-Histogram of Residuals of Equation

Source: Author Estimates with Eviews

The graph plot of confidence ellipse of equation-5 is given in figure-1. It shows confidence curves for bivariate normal distribution and correlation among coefficient of variables. Under bivariate normality, percentage of observations falling inside ellipse following 95 percent confidence prediction ellipse. From correlation among variables perspective, coefficient C (3) has negative linear relationship with C (4) while all other coefficients have positive relationship among each other. The confidence ellipse represents strong correlation at 95 percent confidence prediction level. The histogram of residuals for normality test is given in figure-2. The value of Jarque-Bera test statistics is 21.48 and is significant at 1 percent significance level. The histogram of residual is normally distributed. Finally, H<sub>0</sub> is rejected and H<sub>1</sub> is accepted.

## 5. Conclusion

Return on equity is taken as dependent variable and as an independent variable debt as proportion to equity, total capitalization and debt as proportion to total fund are taken. Panel data estimates in equation that debt as proportion to equity has significant impact on equity return (ROE). Panel estimates found that increase in debt to equity by one dollar brings increase in return on equity by

2.21. 3.31 dollars change in return due to change in debt to equity in random effect. The total capitalization has also significant impact on the returns. The 1.19 dollars and 1.41 dollar increase due to per dollar increase in total capitalization under fixed effect and random effect model respectively. Debt to total fund is not important in respect of profitability point of view because debt to total fund is insignificant in fixed effect and random effect.

The Hausman test results suggest that the random effect model is more accurate. Regression results also quite satisfactory by the Durbin Watson and F-stat. The other measures like confidence Ellipse, Normality of residuals and co variance also show that the results are correct. Final results suggest that debt to equity and total capitalization is significant and has impact on the profitability of firms but debt to total fund is insignificant and has no impact on profitability.

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