

Leverage and firm performance: Empirical evidence from Indian food processing industry

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ABSTRACT

The current study examines the association between financial performance and leverage for 56 food processing firms listed in BSE over the period 2000-2018 using pooled OLS, fixed effects, and random effects models. The results indicate that leverage was significantly and positively associated with the firm performance. The results obtained are thus robust across the estimation methods. The pecking order theory and the static trade-off theory, both seem to explain Indian food processing firms' decisions among the alternative theories of capital structure.

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1. Introduction

An organization's operations and growth are financed through various sources of funds. Although a firm can raise funds from different sources, but debt and equity play a vital role in this regard. Firms depend on many sources of funds, but the sources of debt and equity depend on a large extent. These sources contribute towards the total cost of the firms. The foundation of the modern approach towards capital structure links to the work of Modigliani Miller theory in 1958. This theory has its own importance, despite being considered weak towards various important factors in the leverage process, such as fluctuations and uncertain situations. An extension of this analysis was to investigate the existence of an optimal capital structure which has an impact on the firm's value (Modigliani & Miller, 1963). The value of firm shows the market value that consists of various claims from creditors and stockholders. It is one of the most crucial metrics used in business valuation, risk analysis, accounting and portfolio analysis (Erenburg et al., 2016). Profit maximization and firm value are directly linked. So the present value measurement is the most important concern. Time value of money is a better source for explaining firm value. Therefore, the expected future returns when converted to current returns is termed as firm value. According to the pecking order theory, firms use internal sources of financing first and then go for external sources of financing. Firms with higher profitability will prefer internal financing to debt, hence a negative relationship is expected between profitability and leverage. Most empirical studies confirm the pecking order hypothesis (Titman & Wessels, 1988; Rajan & Zingales, 1995; Michaelas et al., 1999; Kao, 1999; Pedroni, 2001, 2004). According to the static trade-off theory, more profitable firms are supposed to have more debt-serving capacity and more taxable income to shield. Therefore, according to this theory, when firms are profitable, they are likely to prefer debt to other sources in order to benefit from the tax shield. Hence, a positive relationship is expected between

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profitability and leverage. In this paper profitability is considered as both alternative measures (Adrian & Shin, 2010; Arellano & Bond, 1991). The sub-continent of India is the second largest producer of food products, such as vegetables and fruits. The food processing industry of India is of immense importance, because it offers essential synergies and linkages that it creates between two pillars of economy, such as industry and agriculture. This sector promotes around 11 percent of the added value of agriculture and nine percent of the added value of manufacturing, and further it has predominant exports to global nations. This sector has contributed 8.83 percent of manufacturing to Gross Value Added during the period 2017-18, and is growing at a growth rate of 8.41 percent per annum. According to the employment estimates, the share of food processing industry in the overall industry of India is 12.43 percent. Further, the country witnessed an equity flow of foreign direct investment (FDI) up to USD 3.28 billion during the period starting March-April 2019 (Annual Report, MOFPI, 2019). The banks granting credit to food processing during the financial year 2016 was USD 1,016 billion, and there was a huge growth in banks granting credit since the financial year 2007 (Compendium of financing options for the food processing sector, 2017). The credit limit from the banks to food processing industry has increased by 27 percent during the period 2014-2016. Therefore, the major scope of the present study will be to understand the general practices of leverage in India including the sensitivity of leverage on performance of firm; and it will act as a guide for the financial managers to design their optimum leverage to maximize the market value of the firm and minimize the agency cost. Further, this research would educate readers on the effect of leverage on firm performance for listed firms in BSE, and it will also enable managers to understand how equity, debt (long) affects the firm performance and will then adopt a cheaper source of financing. This research would actually improve the financing of most organizations in developing world countries like India, and hence provide a base for development. Also, it will be useful to academicians as a source of knowledge for further research.

2. Literature review

Financial management brings shareholders value as a proof of firm's existence. The value of firm is based on the concept of going concern which represents that the present value of all the expected future flows of cash to be provided by the assets should be discounted at the company's weighted average cost of capital (WACC) (Ehrhard & Brigham, 2003). In turn, it depicts a direct relationship between WACC and the value of firm. The value of shareholder wealth can be maximized by choosing the right proportion between debt and equity. A firm's value by discounting future cash flows can be defined by using WACC. The intention of minimizing WACC of any firm will lead to maximization of the firm's value. Leland and Pyle (1977) propose that managers will take debt-equity ratio as a signal, by the fact that high leverage has a positive impact for higher bankruptcy risk (and costs) for low-quality firms. The debt structure may be considered as a signal to the market as the managers always have an information advantage over the outsiders. Ross's (1977) model suggests that the values of firms will keep increase with leverage, since it increases the market's perception of value. Traditionally, experts believe that an increase in debt leads to an increase in the value of the firm up to a point. Beyond that point, increase in leverage, increases the overall cost of capital and decreases the value of the firm. Modigliani and Mill (1958) debate that leverage is irrelevant by considering the reasonableness of other assumptions, such as the absence of tax, bankruptcy cost, and other imperfections.

The available literature suggests that there is an optimal capital structure, but there is no specific methodology to ensure that it achieves an optimal debt level. However, in their second research paper on corporate capital structure, Modigliani and Mill (1963) show incomplete contradiction that firm value is an increasing function of leverage due to consideration of tax component for interest payments in their work. Debt financing is associated with many other costs, such as bankruptcy costs, personal tax, agency cost, asymmetric information, product/input market interactions, and corporate control considerations probably add up to less than corporate tax benefit (Bradley et al., 1984). In the similar fashion, Devereux et al. (2018) find a positive and substantial long-run income tax effect on capital structure. Their research agreed that the marginal tax rate based on tax returns has greater explanatory power for companies' leverage than the marginal tax rate based on financial statements. In support of the previous research work, Bandyopadhyay and Barua (2016) investigate the linkage of corporate sector performance with the leverage and macroeconomic environment. Their study suggests that the performance of any company hinges around its ability to operate on a leverage. Considering the work of Sukhtankar (2016) on Indian context the economic outcomes of upstream suppliers by comparing privately owned sugar mills to cooperatives and public mills, and found a positive outcome. The functions of institutional investors towards performance and survival of underperformer firms explain by Erenburg et al. (2016), where they conclude a contrast for overperforming firms consistently. The results are negative for activist pension funds and long-term institutions, positive for activist hedge funds and short-term institutions, and mixed for institutional block holders. Also, by investigating the issue among institutional stockholdings and firms' performance and leverage measures of Malaysia, Pirzada et al. (2015) find a significant relationship between firms' performance and leverage. The result from Chung et al. (2013) supports the pecking-order hypothesis, including acquisition among potential financing sources, investigate the relationship between capital structure choice and survival probability. Didier and Schmukler (2013) study the extent to which firms in China and India use capital markets to obtain financing and growth. Their result shows that size among listed firms is more for issuing firms than those that do not issue, suggesting little convergence. Similarly, Margaritis and Psillaki (2010) investigate the relationship between leverage, ownership structure, and firm's performance by employing non-parametric data envelopment analysis methods. Another case study by Chowdhury and Chowdhury (2010) for Dhaka Stock Exchange and Chittagong Stock Exchange to judge the influence of debt-equity structure on the value of shares. A strong positively correlated association evident from the empirical findings from their study. King and Santor (2008) examine the relationship between family ownership affects the performance and capital structure of 613 Canadian firms from

1998 to 2005. Their result supports the structure of family-owned firms with a single share class have similar market performance than other firms based on Tobin's q ratios, superior accounting performance based on return on assets (ROA), and higher financial leverage based on debt-to-total assets. The positive relationship between the ownership structure and financial performance is investigated by Gedajlovic and Shapiro (2002) for 334 Japanese corporations supporting agency theory predictions. Some research has also depicted a mixed result in the past. Vatavu (2015) for instance, finds the results for 196 companies located in Romania to study their relationship between capital structure and financial performance. The results indicate that performance in Romanian companies is higher when they avoid debt and operate based on equity. Further, it seems that manufacturing companies neither use their assets effectively nor do they have sufficient internal funding to undertake profitable investments. Also, Salim and Yadav (2012) investigate the relationship between capital structure and firm performance by considering 237 Malaysian countries and they find that firm performance, measured by return on Equity, return on asset, and earning per share have a negative relationship with short-term debt, long-term debt, total debt. Tobin's Q reports that there is a significantly positive relationship between short-term debt and long-term debt. Research also shows some negative impact of capital structure on the performance of a firm. Empirical results of Vo and Ellis (2017) investigates Ho Chi Minh City stock exchange's capital structure and shareholder value relationship. Their analysis shows a negative relation indicating low leveraged firms are likely to create value for shareholders. Similarly, Rahman and Rajib (2017) studied index revisions and firm performance and found a negative relation between firm performance and leverage. In another study by Rahman and Rajib (2018) examining index revisions and cost of equity capital found negative relation between leverage and cost of equity. There has been a considerable volume of academic papers and studies, both in the developed economies, advanced developing economies and developing economies on the impact of leverage on firms' performance and research is still going on to incorporate the existing theories. Therefore, this work is one of such attempts to provide an empirical evidence in confirming the validity of the theories to assist the firm's management in determining the best Leverage in the Indian Context.

3. Data and Methodology

The current study examines empirically the relationship between financing choices and firm's performance over the period 2000-2018 for the companies listed on BSE. In this regard, the study selected 56 companies (out of 4325 companies) registered with BSE. The company selection is made purely on data availability for the last 19 years. The data for analysis has been collected from the CMIE-Prowess financial database. The Firm's performance or enterprise Value is measured by Operating Profitability, which is measured by the ratio of profits (EBIT) to total assets (Salim & Yadav, 2012; Vatavu, 2015). In general, a positive effect of (past) profitability on efficiency has been expected. More profitable firms are generally better managed and thus are expected to be more efficient (Ebaid, 2009; Saeedi & Mahmoodi, 2011, Tripathy & Pradhan, 2014; Frank & Goyal, 2003). On the other hand, leverage measured by long-term debt to stockholders' equity has been considered as the dependent variable.

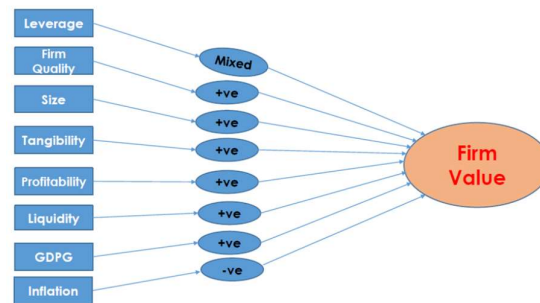


Fig. 1. Linkage of Firm attribute, Quality and Leverage on Firm Value

The Debt-Equity ratio indicates how much debt a company uses to finance its assets relative to the amount of value represented in shareholders' equity (Ebaid, 2009; Chakraborty, 2010; Erenburg et al., 2016; Tripathy & Singh, 2018). Other than long-term debt, some other Control Variables such as Size, Tangibility, Profitability, Liquidity, GDP Growth and Inflation has been considered for the study (See Fig. 1). Firm size (SIZE) has a positive effect on firms' efficiency as larger firms are expected to use better technology, which is measured by the natural log of the firm's sales. This variable has a positive. larger firms may also enjoy economies of scale in monitoring top management (Chakraborty, 2010). But larger firms may suffer from hierarchical managerial inefficiencies and also incur larger monitoring costs. Ebaid (2009) and Chakraborty (2010) suggest that the firm's size may influence its performance; the larger firm may have more capacity and capabilities. Therefore, this study controls the differences in firms' operating environment by including the size variable in the model. The ratio of fixed tangible assets divided by the total assets of the firm termed as Tangibility (TAN). Those assets are easily monitored and provide good collateral and thus they tend to mitigate agency conflicts (Chakraborty, 2010; Sukhtankar, 2016). The core objective of this research is to find out the effect of leverage on financial performance of food processing firms listed on BSE using panel data technique.

$$\begin{aligned}
 \text{Firm Performance}_{i,t} & \\
 &= \alpha_i + \text{Leverage}_{i,t} + \text{Firm Quality}_{i,t} + \text{Size}_{i,t} + \text{Tangibility}_{i,t} + \text{Profitability}_{i,t} \\
 &+ \text{Liquidity}_{i,t} + \text{GDP Growth}_{i,t} + \text{Inflation}_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{1}$$

where, ε_{it} is the residual term, $i = 1, 2, 3, \dots, 56$ $N = 56$ companies, and $t = 1, 2, \dots, 19$ years. Further, some necessary tests like unit root test for checking stationarity of data. All these tests are done with the help of EViews 8 statistical software.

3. Results and discussion

In this section, we report the trend of debt to equity, trend of debt-equity to firm value and the results of empirical model.

3.1. Trend of debt to equity

The trend of Debt to Equity is depicted in Fig. 2. This figure indicates that the Debt to Equity trend is increasing gradually for those food processing firms during the study period. This indicates firm rely more on debt as debt is a tax-free source of financing (Erenburg et al., 2016).

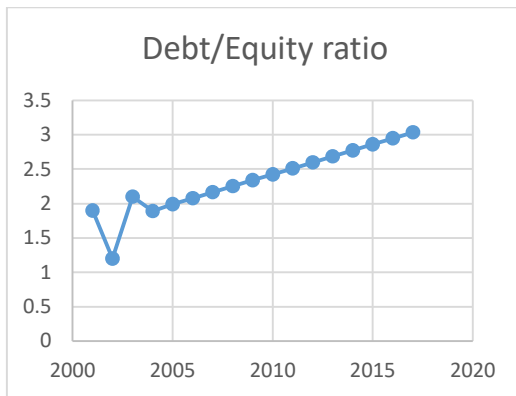


Fig. 2. Trend of Debt-Equity for Food Processing Firms in India

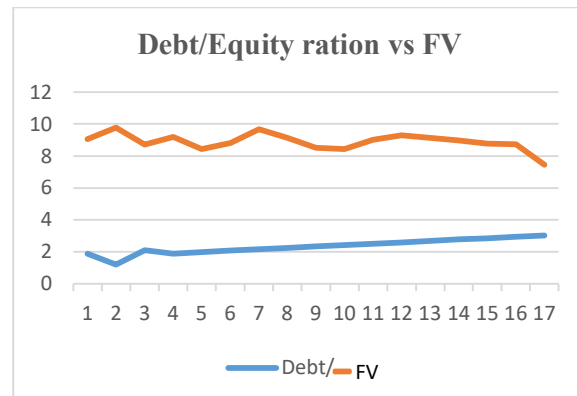


Fig. 3. Trend of Debt-Equity and Enterprise Value for Food Processing Firms in India

3.2. Trend of Debt-Equity to Firm Value

The trend of Debt-Equity to Firm Value is depicted in the Fig. 3. This figure indicates that the Debt-Equity trend is increasing gradually for those food processing firms, whereas the Firm value fluctuates throughout the study period. This indicates debt-equity may not be the single variable which determined the Firm value.

3.3. Empirical results

The quantitative data obtained were analysed using both descriptive (means, standard deviations, frequencies, and illustrations) and inferential statistics (FMOLS and GMM used for testing significantly in determining relationships). Descriptive statistics provides the means and standard deviations of the scores relating to each of the variables used. Table 1 presents a summary of the descriptive statistics of the dependent and independent variables used in the study. Descriptive statistics show the mean, median, minimum, maximum, standard deviation, skewness and kurtosis. Among all the independent variables firm size has a mean value of 4811.96, indicating that the highest standard deviation of 258.92. It indicates that Indian companies' investments is inconsistent, which indicates that Indian companies' capital requirement and/or availability are different and indirectly they finance their asset by using long-term debts. From this result, it shows that Indian companies use around 39% debt to finance their assets. This confirms that they are in a less risky condition and something needs to encourage companies to enhance their business by getting more of debt to have an increase in their value. Further, AGR, SGR, and OPL have negative figure during the period. All variables are positively skewed except firms' profitability. For the dependent variable, Profitability has a minimum of -0.473 and maximum of 0.765 with the average value of 0.123 during the period 2000-2018.

Table 1

Descriptive Statistics

	EV	LEV	Z	SIZ	TAN	PRO	LIQ	GDPG	INF
Mean	13.295	4.482	8.657	4811.96	0.761	0.123	1.72	11.59	7.11
Median	12.115	4.662	8.585	3385.45	0.693	0.122	0.80	12.20	6.30
SD	5.528	2.171	2.843	258.92	0.333	0.085	4.85	2.52	3.11
Skewness	-1.183	-0.359	0.401	3.661	1.450	-0.161	11.46	-0.10	0.99
Kurtosis	9.546	6.131	1.882	7.121	4.357	9.469	163.05	2.64	3.41
Jarque-Bera	2125.84	8761.4	46.1	10.67	14.62	124.61	6506.85	2.33	55.85
P value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.00
Observation	884	884	884	884	884	884	884	884	884

Source: Calculated from the data taken from Prowess

Table 2
Correlation Matrix

	VIF	LEV	Z	SIZ	TAN	PRO	LIQ	GDPG	INF
LEV	1.01	1							
Z	1.01	-0.17	1						
SIZ	1.05	0.13	-0.36	1					
TAN	1.02	0.11	-0.12	-0.15	1				
PRO	1.05	-0.20	0.76	-0.32	-0.21	1			
LIQ	1.09	-0.05	0.07	-0.21	-0.29	0.02	1		
GDPG	1.00	-0.03	0.19	0.05	-0.03	0.26	-0.03	1	
INF	1.00	-0.03	0.12	0.15	-0.05	0.15	-0.08	0.42	1

Source: Calculated from the data taken from Prowess websites for the selected period

The correlations between variables are presented in Table 2. It may be observed that all independent variables are positively associated except operating leverage which has a negative impact on debt, sales growth rate and tangibility. There are no high correlations observed from the data, which allows the conclusion that there is no autocorrelation between the independent variables. Moreover, firm quality and profitability have a little more correlation (correlation coefficient is 0.76). To check the problem of multi-collinearity among the variables, the variance inflation factor (VIF) has been used. This shows how much of the variance of a coefficient estimate of a regressor has been inflated due to collinearity with the other regressors in a series of data. A VIF test has been conducted to examine whether multi-collinearity exists amongst independent variables. Myers (2001) and Nachane (2006) suggested that when $VIF > 10.0$ then there would be a cause of concern. According to Table 2, the highest variance inflation factor (VIF) is 3.69; therefore, there is a low level of multi-collinearity and, as such, multi-collinearity does not exist. The results of pooled OLS, fixed effects and random effects model are given in Table 3. Since each firm has the same number of observations, the study has performed balanced panel using Eviews 8 software.

As pooled OLS assumes no significant time and individual effects, the intercept and slope coefficients of the 56 food processing firms are assumed to be constant over the entire period of 19 years. However, the fixed effect regression assumes constant slope coefficients with varying intercepts for all firms. The key challenge is to determine whether to use pooled OLS model or fixed effect model or random effect model. For determining which model is better between fixed effect and pooled OLS, the F statistic calculated for the equations is given in Tables 3. Since the F statistic value is highly statistically significant, the restricted model of pooled OLS is invalid. Therefore, the unrestricted fixed effect model is better than the restricted pooled OLS. Moreover, a critical factor in determining between fixed and random effect is the correlation between the individual firm error components and the explanatory variables. If they are correlated then fixed effect model is used, whereas if they are uncorrelated, random effect model is used. We use the Hausman test to select among the two models. The null hypothesis is random effect model is consistent and efficient and alternative of random effect inconsistent. In other words, the null hypothesis assumes that individual firm error components and explanatory variables are not correlated. Rejection of null hypothesis implies selection of fixed effect model over random effect model and vice versa. The results of indicate that there exists a positive and significant relationship between leverage and firm value. This shows that the use of debt capital is preferred over the equity in the food processing industry, and it gets supported as per the pecking order theory. Hence, the MM theory of capital structure does not hold good for the food processing industry. The firm quality is positively associated with the firm value, which is expected. This shows that the food processing industry is able to generate returns from operations. Similarly, the firm size is also positively associated with firm value, and this is in line with the studies of Rovolis and Feidakis (2014). Further, the association of tangibility and firm value is positive and significant at the one percent level of significance, and this supports the agency cost theory, and is in support to the studies of Rajan and Zingales (1995) and Tripathy and Pradhan (2014). Profitability is negatively associated with the firm value, since the coefficient is significant and negative. This is due to huge investment in capital assets by the food processing industry.

Table 3
Panel data Equation

Independent Variable	Pooled OLS			Fixed Effect			Random Effect		
	Coefficient	t-stat	P value	Coefficient	t-stat	P value	Coefficient	t-stat	P value
Constant	-2533.54	-42.15	0.00*	-3545.47	-26.09	0.00*	-3805.38	-13.64	0.00*
Leverage	122.54	5.54	0.00*	98.68	7.91	0.00*	98.61	7.91	0.00*
Firm Quality	4321.41	20.46	0.00*	2267.24	12.48	0.00*	2266.91	12.50	0.00*
Size	7288.81	75.79	0.00*	5480.17	28.15	0.00*	5506.70	28.54	0.00*
Tangibility	2965.68	4.32	0.00*	1258.79	1.54	0.12	1255.61	1.54	0.12
Profitability	-298.58	-8.45	0.00*	-219.19	-7.67	0.00*	-218.48	-7.65	0.00*
Liquidity	174.80	5.13	0.00*	109.72	4.51	0.00*	110.25	4.53	0.00*
GDP Growth	260.38	3.85	0.00*	351.24	7.66	0.00*	351.38	7.66	0.00*
Inflation	-198.62	-3.68	0.00*	-23.29	-0.57	0.56	-25.86	-0.64	0.51
R ²		0.601			0.754			0.246	
Adj R ²		0.599			0.542			0.245	
F-Statistic		805.98			834.52			198.02	
Prob (F-Stat)		0.00			0.00			0.00	
DW Statistic		0.524			1.211			1.201	
F test			F Statistic = 322.903, p value = 0.00						
Hausman test								Chi square statistic = 3.9801, p value = 0.2351	

Source: Calculated from the data taken from Prowess websites for the selected period

Moreover, liquidity is positively associated with the firm value, which shows that the food processing firms maintain sufficient funds to finance short-term operations. Lastly, the GDP is positively associated with the firm value and inflation is significant, which indicates that economic development has positive effect on the firm value. Therefore, it can be concluded from the above results that different variables, such as leverage, firm quality, firm size, tangibility, liquidity and GDP are positively associated with the firm value, hence the MM theory of capital structure does not get supported.

5. Conclusion and scope for future research

The present study gives a picture to understand the general practices of Leverage in India including the sensitivity of leverage to the performance of food processing firms, and it will act as a guide for finance managers to design their optimum leverage to maximize the market value of the firm and minimize the agency cost. Further, this research would educate readers on the effect of Leverage on firm's performance, and it will also enable managers to understand how equity and debt (long) affect firm's performance and will then persuade them to adopt a cheaper source of financing. This research would actually improve the financing of most organizations in developing world countries like India and hence provide a base for development. It will also be useful to academicians as a source of knowledge for further research. This study has aimed to contribute to the existing literature in various ways. Firstly, it is one of the few studies which enhance the understanding of factors affecting firm value of food processing sector in India over a large time frame of 19 years. Large gestation period and funding structure being key concerns, make it imperative to understand unique factors which influence firm value. Majority of the studies are done in manufacturing sector. Secondly, it is one of the first empirical tests to use firm quality score of Z value as it has not been tested in food processing sector in Indian context. In a nut shell, the study provides positive evidence which indicates that a firm's performance is influenced by the Leverage for the Indian listed companies. Leverage in India has a positive impact on Firm performance (Erenburg et al., 2016) and suggests that maximizing the wealth of shareholders requires a perfect combination of debt and equity. A study could be done based on sector wise analysis; such as: Business group firm and standalone firm; Listed and unlisted companies; High and Low market capitalization firm; Manufacturing and Trading firm and more independent variables; like: Tax rate, Business Risk, Liquidity, Annual Inflation rate, etc. could be considered to check the result.

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