Does Financial Leverage Impact the Financial Performance of Pharmaceutical Companies in Bangladesh?

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Abstract:

Purpose: *This study aims to examine the impact of determinants of leverage on the financial performance of pharmaceutical companies in Bangladesh.*

Design/Methods/Approach: *This study covers a data-set of 24 companies, which are chosen based on their availability of data. The study sets 13 variables consisted of 3120 observations for the period of 10 years, which are processed using financial ratios and followed by previous literature. After that we used the panel regression model to analyze the data to serve the study purpose.*

Findings/Results: *The study after analysis finds that the debt-equity ratio had a significant impact on the financial performance of pharmaceutical companies as measured by EPS, which is adopted by packing order theory. Additionally, the long-term debt ratio showed a significant impact on the profitability of the same companies. Besides the given findings, firm size had been a significant issue to lead the financial performance of pharmaceutical companies in Bangladesh.*

Practical Implications: *The findings of the study are more useful to the professional practices of financial managers, policy makers, decision-support, and industrial initiators, who are endeavors to develop the industry.*

Originality/Value: *The study initially bears an innovative value to adopt financial strategy to explore a competitive advantage in the era of global competition.*

Keywords: *Financing strategy, capital structure, debt-equity mix, firm size, financial performance.*

JEL Classification: *G01, G02, G03, M01, O01, O43.*

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1. Introduction

Research on Financial leverage has been a more debated topic since 1958 first developed a theory of capital structure by Modigliani and Miller (1958). Still, now there are no common consensuses for all capital structure theories developed at different times and their effect on firm value or profitability (Pagkalou *et al.,* 2024). However, firm managers doubted the impact of financial leverage on firm value or financial performance. Financial leverage is the use of borrowed funds in the capital structure by firms upon which interest payment is tax deductible resulting in profitability (Akhter *et al.,* 2012).

Therefore, the financing mix is an important topic to identify the firm financial performance. A financial leverage is designed by a firm in a way to keep its goal on the priority that maximum tax might be deductible on interest expense, which is used to finance its investment and expansion of operations. It is a representation of how a company will raise its capital and use equity and debt.

Furthermore, in the context of a company's goal of profit maximization, the terms "capital structure" and "financial structure" are generally used interchangeably, but have little distinct meaning. Therefore, both terms often refer to the combination of multiple sources of finance that various companies employ to generate revenue (Barakat, 2014).

Research on this topic is very scanty and partial, which are not complete to conclude financial policies and decisions. Rao, (2007) focuses on the impact of financing mix on financial performance, and financial performance is determined by company's financial results with analysis and the ability to profitably manage costs and create shareholder value. Modigliani and Miller (1958) initially started their works on the financing mix and provided several critics known as the irrelevancy theory. Khalid Ali, Baloch, and Ali (2014) tested the effect of financial liberalization on dividend payout ratio, which provided a significant impact on dividend payout policy.

Trade-off theory predicts that debt-equity mix to be optimal to determine the profitability (Abor, 2005; Roden and Lewellen, 1995). Fama and French (2000) find that agency problem leads to have an inverse impact of debt on firm performance as it causes conflict between debt holders and shareholders. Siahaan, Ragil Solimon, (2014) investigated on the 60 listed companies that indicates an adverse and insignificant relationship between leverage and profitability.

Hasan *et al.* (2014) finds that the effect of financing mix on profitability is negative and significant. According to Saifuddin et al. (2015), a levered firm is more financially benefited than unlevered firms. Hence the results of previous studies are mixed and partials.

The study focused on the pharmaceutical companies of Bangladesh due to several reasons as the country was only explored by a few global corporations. The growing awareness of health problems among the general public has boosted the market for Bangladesh's pharmaceutical exports. As of 2022, there were 257 (BAPI) licensed manufacturers of allopathic drugs, up from 173 in 2000.

There are currently many different drug brands manufactured by pharmaceutical firms in Bangladesh, each of which contains roughly 1500 unique medication varieties. It has developed into an industry that can supply itself and meet 98% of domestic demand. With a job growth rate of roughly 11.37%, this sector has been instrumental in helping Bangladesh reduce its high unemployment rate.

According to the IMS Health Report, the local market is expected to be worth BDT 160 billion by 2018. Nonetheless, the sector continues to rely on imports of foreign raw resources. Profitability in this sector might be boosted by careful management of financial leverage. That's why we set out to investigate the connection between financial leverage and returns (Chowdhury *et al.,* 2018).

This study shows Bangladesh's pharmaceutical business, which has evolved and becomes a major economic sector. Many Bangladeshi pharmaceutical companies are struggling to survive despite tremendous growth. Competition, rising production costs, regulatory constraints, and limited financing make profit margin maintenance difficult.

Evaluating the financial structure and profitability of pharmaceutical firms in Bangladesh is crucial and difficult for several reasons, including the need to improve financial management, identify key financial factors that affect profitability, and propose solutions also the study has determined that the financial performance of a pharmaceutical company is influenced by its financial structure, which can have a significant impact on the company's profit potential, either positively or negatively.

Holding debt alongside equity during a capital crisis entails the payment of interest on the aforementioned debt from the entire profits of the firm, regardless of whether the financial structure of the pharmaceutical company is dictated by its equity and debt, which are considered total assets.

The influence on the pharmaceutical company's financial performance occurs from changes in interest payments, liquidity corporation tax payments, and the size of potential returns is crucial, as is the maintenance of this debt.

The objective of this study is to evaluate the determinants of the financial structure of pharmaceutical companies in Bangladesh and to examine the impacts of financial structure on financial performance of pharmaceutical industries in Bangladesh. Two research questions:

RQ1: What determines Bangladesh's pharmaceutical industry's financial structure?
RQ2: How does pharmaceutical sector financial structure affect profitability?

These research questions have been formulated to have a broad understanding of the research and make the research target more specific, and some other variables like liquidity ratio, firm size, asset growth rate, and tax rate have been used to determine the impact on performances of return on capital employed that have not been done in many previous studies but are important in the current context for accurate impact measurement and financial structure guidance will play a role and this study emphasizes results from secondary data, and this study studied the impact of financial leverage on financial performance over 10 years, from 2013 to 2022.

This study sets out to examine how the pharmaceutical industry's financial leverage affects its financial performance. In what follows, learn about the pharmaceutical industry in Bangladesh. The results of similar studies conducted in Bangladesh and other countries are summarized in this study's literature review section. The methodology section explains the data sources, dependent, independent, and control variables, conceptual framework, development of research hypotheses, and model specification.

In the segment on analysis and findings, the outcomes of the descriptive statistics, correlation matrix, and a linear regression model are illustrated. In addition, the factors that have a substantial impact on the main pharmaceutical industry's financial performance in Bangladesh are identified. Hence the research work is structured as section-2 provides a discussion of literature review, and development of hypothesis, and theoretical framework, section-3 includes variable measurements and methods, section-4 describes the findings, and section-5 includes the concluding remarks and policy implications.

2. Literature Review

Most of the empirical studies conducted the relationship between capital structure and firm's profitability in both developed and developing economies, but very little studies are found investigated on the impact of leverage financing on financial performances of pharmaceutical companies. Leverage is the part of capital used in a firm, which is borrowed from financial institutions or issuing bond or debenture.

Leverage includes current liabilities and long-term debt employed in financial structure. Modigliani and Miller (1958) first provided an idea of capital structure theory, known as irrelevancy theory, which means that firm performance is not determined by the mix of debt-equity. Khalid Ali, Baloch, and Ali (2014) investigated the impact of financial liberalization on dividend payout ratio of 374 listed firms from 1988 to 2008.

According to the trade off theory, the debt level is at a point which makes firm maximum tax benefits and this theory predicts that there should be a positive relationship between debt level and profitability (Abor, 2005; Roden and Lewellen, 1995). Fama and French (2000) suggested that agency problem may lead to an inverse relationship between debt and firm performance as agency problem is created between debt holders and shareholders.

Singapourwoko and El-Wahid examined the impact of leverage and profitability of 48 companies across the periods of 2003- 2008 listed on Indonesian stock exchange. The results find a significant positive connection between leverage and profitability. Siahaan, Ragil Solimon, (2014) investigated a study on 60 listed companies on Indonesian stock exchange. The study indicates an adverse and insignificant relationship between leverage and profitability.

Hasan *et al.* (2014) finds that the impact of financial leverage on profitability is negative and significant, which is investigated based on 36 listed firms for the period of 2007-2012. According to Saifuddin et al. (2015), stockholders of levered firms are more financially benefited than unlevered firms due to such levered firms find more tax-advantaged.

Singh and Bansal (2016) investigated the impact of capital structure of 58 listed companies, which indicated that debt-equity ratio has a significant impact on financial performance compared to the study of Ahmed *et al.* (2005). While Diego Garcia-Gomez *et al.* (2020) find an inverse relationship between leverage and financial performance, which accords the packing order theory.

Guo *et al.* (2020) showed that the use of debt level might increase the profitability. Dalai (2018) revealed an adverse connection between debt and profitability, as both STDR and TDR have positive effects on profitability using the panel data of 1,503 resisted manufacturing firms in China from 2006 to 2017.

Chen (2020) examined the effect of leverage on financial performance of Chinese firms, which finds that debt-ratio is positively related to the firm's performance using OLS and 2SLS methods, while, Al-Tally (2014) finds that debt level leads to increased profitability (Ahmed, Awaise, and Kashif, 2018). Thalassinos *et al.* (2023) studied the asset pricing model on the example of Pakistan.

Demirguc-Kunt *et al.* (2020) showed the impact on capital structure on financial performance of 75 countries during COVID-19 and found that the reduction in debt and maturity reduction have the significant effect on the profitability of the listed firms. Hotchkiss *et al.* (2020) find that levered firms were more affected than non-levered firms during pandemic situations. Many companies try to maximize asset utilization in order to obtain benefits from utilizing more resources.

As a result, maximum sales can be achieved, and this leads to an increase in corporate profit, which is considered one of the main factors in measuring a firm's performance, ROA, TQ, and EPS (Pham and Tran, 2020; Seth *et al.* 2020).

Diakomihalis (2011) investigated on the impact of Financial Structure on the profitability of Greek hotels from 2005 to 2007. The study finds that long-term debt ratio is negatively related to the profitability. Khan (2022) investigated the relationship between capital structure and firm performance of pharmaceutical and chemical companies of 22 companies for 8 years from 2013 to 2022 using panel corrected standard error.

The results of study reveal that long-term debt and short-term debt ratio are statistically significant, and their relationship is negative. Siddik *et al.* (2017) focused on the impact of capital structure on performance of 22 listed banks in Bangladesh during 2005 to 2014, and found an inverse relationship between capital structure and bank performance using ROA, ROE and EPS.

Nguyen and Nguyen (2020) evaluated the relationship between capital structure and firm performance of state owned and non-state-owned companies listed on Vietnam stock exchange for the period of 2013 - 2018 using generalized least square method. The study finds that there exists statistically significant and inverse relationship between capital structure and firm performance.

3. Development of Hypotheses

H_1 : There exists positive relationship between Debt-equity ratio and pharmaceutical industry's profitability.

H_2:   Long term debt to equity ratio is positively connected with pharmaceutical industry's profitability.

H_3 :   There is an inverse relationship between short term debt to equity ratio and pharmaceutical industry's profitability.

H_4:   Long term debt to asset ratio is positively connected with pharmaceutical industry's profitability.

H_5 :   There is an inverse relationship between short term debt to asset ratio and pharmaceutical industry's profitability.

H_6 :   An inverse relationship exists between Liquidity ratio and pharmaceutical industry's profitability.

H_7 : There is a positive relationship between firm size and pharmaceutical industry's profitability.

H_8 : There is a positive relationship between Asset growth rate and pharmaceutical industry's profitability.

H_9 : Corporate tax rate has positive impact on the pharmaceutical industry's profitability.

4. Theoretical Review and Framework

The conceptual review of financial structure and financial performance are described in this part to understand how firm performance is affected by financial leverage. Different academic research and financial theories assert the financial mix that influences the firm performance.

Financial performance is defined as the results of using the financial inclusion, combination and efficient management of financial resources. The aim of financing mix is the wealth maximization, which comprises of different financial instruments such as debt, debenture, bank loans, even be management of current liabilities. The financing mix or leverage of one industry might vary from another industry, and be viewed as the different impact on firm performance.

Financial performance is viewed as return on assets, return on equity, return on capital employed, earning per share and how these variables are impacted by financing mix or financial leverage. The relationship between dependent variables and independent variables are measured by panel regression models as described in the previous studies of Abor (2007), Ebid (2009), Yazdanfar, D and Öhman(2015), are shown in Figure 1.

Figure 1. *Theoretical framework*
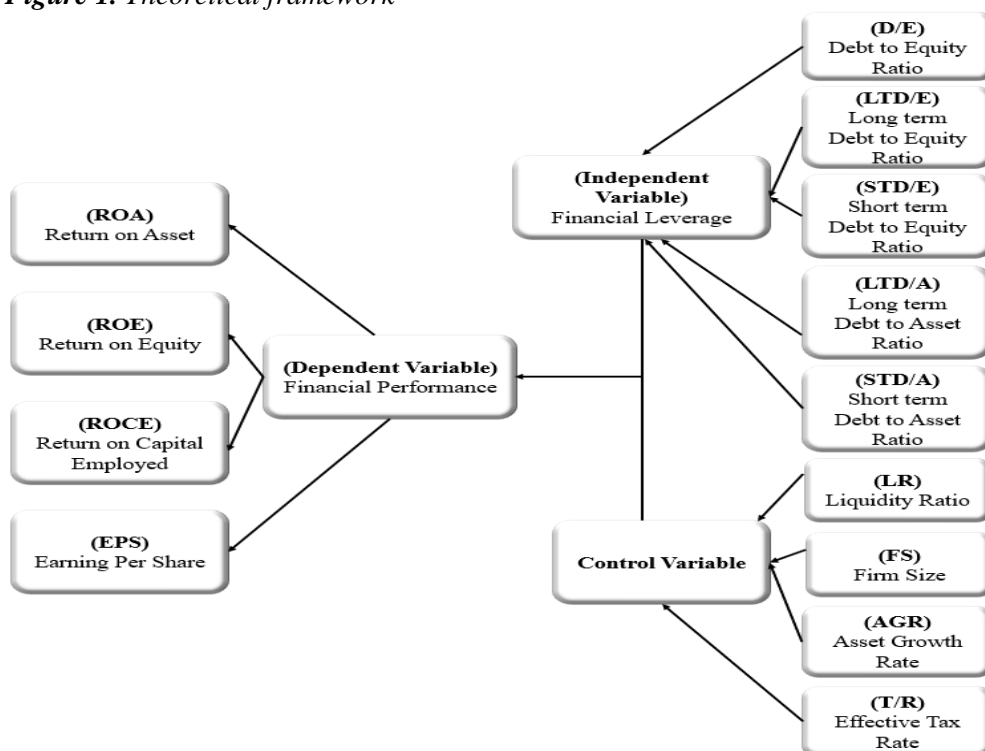
Source: Own study.

5. Material and Methods

5.1 Population, Sample and Data Collection

The study is operated on the impact of financial structure on financial performance of pharmaceutical companies as this industry is considered as the fulfillment of life-necessitate and GDP growth of economy. The Directorate General of Drug Administration (DGDA) and the Bangladesh Association of Pharmaceutical Industries (BAPI) estimate that a total of 257 firms received licenses, of which 150 are currently operating in manufacture.

We included 24 companies across the 150 companies to test the impact of financial structure on financial performance considering their age, growth, assets, availability of data, etc. Due to the limits of data quality, and availability, the sample size of 24 is considered as optimal.

After choosing an optimal sample size, the study period covers 10 years from 2013 to 2022 to fulfill the consistency of balanced data. So far as our knowledge goes, before conducting this study, the investigation of industry-based financial structure is found very limited and, found not a systematic investigation. Determining the sample size, we set four-consecutive models used as alternatives of profitability referring to the financial performance by investigating previous studies.

5.2 Measurement of Variables

The study included a total of 13 variables across four different models. Return on assets (ROA), which measures profitability by dividing net profit by total assets, was one of the variables used. Return on equity measures a pharmaceutical company's ability to generate profits that are due to equity holders and satisfy equity investors' need (Nwadiubu, 2022; Murniati, 2016).

In the model, we captured return on capital employed, measures the profitability of pharmaceutical companies, which is calculated by dividing net profits by total capital(Shareholders' equity + Long term debt) (Lisek, Luty, and Ziolo, 2020). We also included earnings per share (EPS), which measures net profit divided by total number of shares. Earning per shares (EPS) means the generating income for each unit of shares (Taani, 2011).

The independent variables are the debt-equity ratio, which indicates the financial resilience of a firm measured by total debt divided by shareholders' equity. A higher debt-equity ratio suggests that debt ratio is more of a company's assets than equity. A company with a higher equity ratio has less financial risk and can borrow less. The pharmaceutical industry is more creditworthiness, liquidity, access to capital, and financial flexibility can be affected by long-term and short-term debt-to-equity ratio (Nwaolisa, 2016).

Long-term and short-term debt-to-asset ratios should be interpreted in light of the company. Due to its high capital requirements, the pharmaceutical industry may have higher debt levels. The extend of debt either is current or long-term liabilities depends on nature of firm (Chandra and Juliawati, 2020).

We additionally consider some control variables are liquidity, firm size, asset growth rates, and tax rates to investigate their effects on profitability. Liquidity measures a company's short-term solvency. Liquidity affects the pharmaceutical business because cash-rich companies can better weather supply chain interruptions, regulatory changes, and product approval delays.

They can pay bills, run their firm, and invest in RandD with enough cash. They are more likely to weather economic storms like revenue declines or increased competition without resorting to distress measures like excessive borrowing or asset sales (Saleemand and Rehman, 2011). Size can impact a pharmaceutical company's operations, market position, and strategy.

A larger pharmaceutical company has a stronger brand name, more distribution networks, and a wider market presence. Firm size gives large organizations additional power in supplier negotiations, talent acquisition, and price cuts. They can invest heavily in drug research, clinical trials, and regulatory approvals to build a robust product pipeline a study included a total of 13 variables across four different models.

Return on assets (ROA), which measures profitability by dividing net profit by total assets, was one of the variables used. Return on equity measures a pharmaceutical company's ability to generate profits that are due to equity holders and satisfy equity investors needed a competitive edge. Asset growth indicates a pharmaceutical company's growth and investment strategy (Ariyani, Pangestuti, and Raharjo, 2018).

Tax rates affect the pharmaceutical sector in several ways. Lower tax rates increase after-tax earnings and profitability. RandD, growth, and shareholder returns may benefit pharmaceutical enterprises. Research tax credits, orphan drug tax benefits, and pharmaceutical industry tax rates can affect investment, RandD, and drug price decisions. Tax and regulatory changes could affect business budgeting and decision-making.

Global pharmaceutical companies may face different tax and regulatory restrictions in different nations (Saragih *et al.,* 2019).

Table 1. Definition of variables

Variables	Full Abbreviations	Measure	Variables
Dependent	Return on Asset	Net profit divided by Total assets	**ROA**
Variable Financial	Return on Equity	Net profit divided by shareholders' equity	**ROE**

Performance	Return on Capital Employed	EBIT divided by total capital	**ROCE**
	Earnings per share	Net profit divided by number of shares	**EPS**
Independent Variable Financial Structure	Debt Equity Ratio	Total debt divided by Shareholder's equity	**D/E**
	Long term debt to Equity Ratio	Long term debt divided by Total Shareholder's Equity	**LTD/E**
	Short term debt to Equity Ratio	Short term debt divided by Total Shareholder's Equity	**STD/E**
	Long term debt to Asset Ratio	Long term debt divided by Total Asset	**LTD/A**
	Short term debt to Asset Ratio	Short term debt divided by Total Asset	**STD/A**
Control Variable	Liquidity Ratio	Current Asset divided by Current Liabilities	**LR**
	Firm Size	Natural logarithm of total assets	**FS**
	Asset Growth Rate	Total assets in current year minus total assets in previous year divided by total assets of previous year.	**AGR**
	Tax Rate	Income Tax Expenses divided by EBT	**T/R**

Source: *Own study.*

5.3 Data and Data Analysis Methods

After the sample had been selected, the study concentrated on gathering data pertaining to the variables employed and computing it using mathematical procedures. The factors selected were determined by previous research and financial literature. The necessary data was gathered from various financial closures, such as annual reports, financial statements, financial notes, and cash follow statements, during the 10-year period between 2013 to 2022.

Five leverage ratios were utilized as a proxy for financial structure, and four control variables were used to balance out the alternative profitability ratios. We included 13 variables of 24 companies over 10 years, yielding 3120 observations.

The pattern of data used is full balanced data to investigate the impact of determinants on the financial performance. To serve this purpose, we used several dependent variables against the independent variables to test the impact of financial structure on profitability. Robustness checks are also employed for several dependent variables and several methods to find solid results.

To make the results legally recognized, we employed many diagnostic tests before using linear regression analysis. Since all sample firms are homogeneous in producing the same products in the pharmaceutical industry, which allows us to

employ a panel linear regression model. We also conducted tests of descriptive statistics and multicollinearity problems.

5.4 Parameters for the Model Variables and Models for Research

The following regression models are estimated (Gill *et al.,* 2011; Murniati, 2016; Eriotis *et al.,* 2021; Trigkas *et al.,* 2019).

- $ROA=\beta_0+\beta_1 D/E+\beta_2 LTD/E+\beta_3 STD/E+\beta_4 LTD/A+\beta_5 STD/A +\beta_6 LR+\beta_7 FS+\beta_8 AGR +\beta_9 TR+ e$…...…………………………………(i)
- $ROE=\beta_0+\beta_1 D/E+\beta_2 LTD/E+\beta_3 STD/E+\beta_4 LTD/A+\beta_5 STD/A+\beta_6 LR+\beta_7 FS+\beta_8 AGR+\beta_9 TR+ e$ ……...................................(ii)
- $ROCE=\beta_0+\beta_1 D/E+\beta_2 LTD/E+\beta_3 STD/E+\beta_4 LTD/A+\beta_5 STD/A +\beta_6 LR+\beta_7 FS+\beta_8 AGR +\beta_9 TR+ e$…………………………………(iii)
- $EPS=\beta_0+\beta_1 D/E+\beta_2 LTD/E+\beta_3 STD/E+\beta_4 LTD/A+\beta_5 STD/A +\beta_6 LR+\beta_7 FS+\beta_8 AGR +\beta_9 TR+ e$………………………………….(iv)

6. Results and Discussion

6.1 Descriptive Statistics

Descriptive statistics represents the characteristics of dataset to understand its impact on the results (Narinder and Mahima, 2019).

Table 2. *Descriptive statistics of variables*

	OB	Minimum	Maximum	Mean	Std. Deviation
ROA	3120	.00	.21	.0841	.05159
ROE	3120	.00	1.34	.1510	.14181
ROCE	3120	.02	.45	.1789	.08901
EPS	3120	.04	91.05	15.6157	15.60355
D/E	3120	.03	1.20	.6014	.18780
LTD/E	3120	.01	6.34	.3046	.65627
STD/E	3120	.03	20.19	.7774	2.01795
LTD/A	3120	.01	.40	.1176	.08052
STD/A	3120	.02	.57	.2867	.13516
LR	3120	.72	18.74	2.4369	3.20328
FS	3120	4.48	10.99	8.6073	2.25192
AGR	3120	-.43	.98	.1709	.19632
T/R	3120	.01	2.03	.2797	.19814

Source: *Results are estimated by using data from Pharmaceutical Industry (20013–2022).*

The results of descriptive statistics are shown in Table 2 that the average return on assets is 8.41 percent and the highest ROA of our samples is 21 percent and minimum ROA is 0 percent with its variability of 5.15 percent. In case of ROE, we

find average ROE is 15.10 percent and the maximum and minimum values of ROE are from 0 percent to 134 percent with a standard deviation of 14.18 percent. Regarding ROCE, the average value of ROCE is 17.89 percent and the maximum and minimum values of ROCE are from 2 percent to 45 percent (SD = 0.8901).

The average EPSis 15.61 and its range is from 0.04 to 91.05 with standard deviation of 15.6157. Pharmaceutical industry equity averaged 0.6014 with a variance of 0.18780, indicating a high risk. An average LTD/E of 0.3046 with a variation of 0.65627 showed significant risk.STD/E averages 0.7774 and varies by 2.01795.

Average LTD/A 0.1176 with variation 0.08052 is favorable and low risk. The average value of STD/A is 0.2867, with a variance of 0.13516. The firm size has a range of 4.48–10.99 with a standard deviation of 2.25192.

According to the pharmaceutical industry, the asset growth rate averages 0.1709, with a variation of 0.19632 indicating high risk; the tax rate ranges from 0.01–2.03; and the standard deviation of 0.19814 is favorable compared to the mean of 0.2797 (Shubita and Alsawalhah, 2012).

6.2 Correlation Matrix among the Variables

The present investigation employs the correlation coefficient as a means to examine the nature and strength of the association between the dependent and independent variables (Gharaibeh, 2015).

Table 3. *Pearson Coefficient correlations of Variables (ROA used as Dependent variable)*

Correlations		ROA	D/E	LTD/E	STD/E	LTD/A	STD/A	LR	FS	AGR	T/R
RO A	Pearson Correlation	1	.498**	-.264**	-.174	-.522**	-.267**	.372**	-.010	.050	-.190
	Sig. (2-tailed)		<.001	.008	.084	<.001	.007	<.001	.918	.623	.059
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
D/E	Pearson Correlation	.498**	1	-.537**	-.482**	-.558**	-.668**	.507**	.144	-.203*	-.20*
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001	<.001	.152	.043	.046
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD /E	Pearson Correlation	-.264**	-.537**	1	.959**	.395**	.327**	-.147	-.024	.032	.064
	Sig. (2-tailed)	.008	<.001		<.001	<.001	<.001	.144	.811	.751	.527
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD /E	Pearson Correlation	-.174	-.482**	.959**	1	.153	.390**	-.141	-.016	.053	.038
	Sig. (2-tailed)	.084	<.001	<.001		.129	<.001	.161	.874	.598	.710
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120

LTD /A	Pearson Correlation	-.522**	-.558**	.395**	.153	1	.210*	-.308**	-.122	-.044	.165
	Sig. (2-tailed)	<.001	<.001	<.001	.129		.036	.002	.229	.667	.101
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD /A	Pearson Correlation	-.267**	-.668**	.327**	.390**	.210*	1	-.593**	-.227*	-.002	.141
	Sig. (2-tailed)	.007	<.001	<.001	<.001	.036		<.001	.023	.980	.160
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LR	Pearson Correlation	.372**	.507**	-.147	-.141	-.308**	-.593**	1	.209*	.012	-.100
	Sig. (2-tailed)	<.001	<.001	.144	.161	.002	<.001		.037	.906	.320
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
FS	Pearson Correlation	-.010	.144	-.024	-.016	-.122	-.227*	.209*	1	-.313**	.094
	Sig. (2-tailed)	.918	.152	.811	.874	.229	.023	.037		.002	.354
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
AGR	Pearson Correlation	.050	-.203*	.032	.053	-.044	-.002	.012	-.313**	1	-.142
	Sig. (2-tailed)	.623	.043	.751	.598	.667	.980	.906	.002		.159
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
T/R	Pearson Correlation	-.190	-.200*	.064	.038	.165	.141	-.100	.094	-.142	1
	Sig. (2-tailed)	.059	.046	.527	.710	.101	.160	.320	.354	.159	
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Source: *Results are estimated by using data from Pharmaceutical Industry (20013–2022).*

Table 3 shows the relationship between dependent variable (ROA) and independent variables to examine the multicollinearity problems. Debt-equity ratio is positively related to profitability, liquidity, firm size and is negatively connected with long term-debt to equity ratio, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Long term-debt to equity ratio is negatively related to profitability, liquidity, firm size and is positively connected with short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Short term-debt to equity ratio is negatively related to profitability, liquidity, firm size and is positively connected with long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Long term-debt to asset ratio is negatively related to profitability, short term debt to asset, liquidity, firm size, asset growth rate and is positively connected with short term-debt to asset, tax rate.

Short term-debt to asset ratio is negatively related to profitability, liquidity, firm size, asset growth rate and is positively connected with tax rate.

Liquidity ratio is positively related to profitability, firm size, asset growth rate and is negatively connected with tax rate.

Asset growth rate is negatively related to profitability, asset growth rate and is positively connected with tax rate. Firm size is positively related to profitability, and is negatively connected with tax rate. Tax rate is negatively related to profitability, (Pouraghajan *et al.,* 2012).

Table 4. *Pearson Coefficient correlations of Variables (ROE used as Dependent variable)*

Correlations		ROE	D/E	LTD/E	STD/E	LTD/A	STD/A	LR	FS	AGR	T/R
ROE	Pearson Correlation	1	-.254*	.754**	.829**	-.087	.222*	.003	-.078	.119	-.069
	Sig. (2-tailed)		.011	<.001	<.001	.388	.027	.973	.438	.240	.494
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
D/E	Pearson Correlation	-.254*	1	-.537**	-.482**	-.558**	-.668**	.507**	.144	-.203*	-.200*
	Sig. (2-tailed)	.011		<.001	<.001	<.001	<.001	<.001	.152	.043	.046
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/E	Pearson Correlation	.754**	-.537**	1	.959**	.395**	.327**	-.147	-.024	.032	.064
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001	.144	.811	.751	.527
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/E	Pearson Correlation	.829**	-.482**	.959**	1	.153	.390**	-.141	-.016	.053	.038
	Sig. (2-tailed)	<.001	<.001	<.001		.129	<.001	.161	.874	.598	.710
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/A	Pearson Correlation	-.087	-.558**	.395**	.153	1	.210*	-.308**	-.122	-.044	.165
	Sig. (2-tailed)	.388	<.001	<.001	.129		.036	.002	.229	.667	.101
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/A	Pearson Correlation	.222*	-.668**	.327**	.390**	.210*	1	-.593**	-.227*	-.002	.141
	Sig. (2-tailed)	.027	<.001	<.001	<.001	.036		<.001	.023	.980	.160
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LR	Pearson Correlation	.003	.507**	-.147	-.141	-.308**	-.593**	1	.209*	.012	-.100
	Sig. (2-tailed)	.973	<.001	.144	.161	.002	<.001		.037	.906	.320
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
FS	Pearson Correlation	-.078	.144	-.024	-.016	-.122	-.227*	.209*	1	-.313**	.094
	Sig. (2-tailed)	.438	.152	.811	.874	.229	.023	.037		.002	.354
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
AGR	Pearson Correlation	.119	-.203*	.032	.053	-.044	-.002	.012	-.31**	1	-.142
	Sig. (2-tailed)	.240	.043	.751	.598	.667	.980	.906	.002		.159
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120

T/R	Pearson Correlation	-.069	-.200*	.064	.038	.165	.141	-.100	.094	-.142	1
	Sig. (2-tailed)	.494	.046	.527	.710	.101	.160	.320	.354	.159	
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Source: *Results are estimated by using data from Pharmaceutical Industry (20013–2022).*

Table 4 shows the relationship between dependent variable (ROE) and independent variables to examine the multicollinearity problems. Debt-equity ratio is negatively related to profitability, long term-debt to equity ratio, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate and is negatively connected with liquidity, firm size. Long term-debt to equity ratio is positively related to profitability, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate and is negatively connected with liquidity, firm size.

Short term-debt to equity ratio is positively related to profitability, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate and negatively connected with liquidity, firm size. Long term-debt to asset ratio is negatively related to profitability, liquidity, firm size, asset growth rate and is positively connected with short term-debt to asset, tax rate. Short term-debt to asset ratio is negatively related to liquidity, firm size, and asset growth rate and is positively connected with profitability.

Liquidity ratio is positively related to profitability, firm size, asset growth rate and is negatively connected with tax rate. Asset growth rate is positively related to profitability, and is negatively connected with tax rate. Firm size is negatively related to profitability, asset growth rate and is positively connected with tax rate. Asset growth rate is positively related to profitability, asset growth rate and is negatively connected with tax rate. Tax rate is negatively related to profitability, as per the findings of (Odusanya *et al.,* 2018).

Table 5. *Pearson Coefficient correlations of Variables (ROCE used as Dependent variable)*

Correlations		ROCE	D/E	LTD/E	STD/E	LTD/A	STD/A	LR	FS	AGR	T/R
ROCE	Pearson Correlation	1	.052	.033	.158	-.348**	.370**	-.036	-.053	-.047	-.126
	Sig. (2-tailed)		.610	.743	.117	<.001	<.001	.725	.602	.639	.211
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
D/E	Pearson Correlation	.052	1	-.537**	-.482**	-.558**	-.668**	.507**	.144	-.203*	-.20*
	Sig. (2-tailed)	.610		<.001	<.001	<.001	<.001	<.001	.152	.043	.046
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/E	Pearson Correlation	.033	-.537**	1	.959**	.395**	.327**	-.147	-.024	.032	.064
	Sig. (2-tailed)	.743	<.001		<.001	<.001	<.001	.144	.811	.751	.527

	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/E	Pearson Correlation	.158	-.482**	.959**	1	.153	.390**	-.141	-.016	.053	.038
	Sig. (2-tailed)	.117	<.001	<.001		.129	<.001	.161	.874	.598	.710
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/A	Pearson Correlation	-.348**	-.558**	.395**	.153	1	.210*	-.308**	-.122	-.044	.165
	Sig. (2-tailed)	<.001	<.001	<.001	.129		.036	.002	.229	.667	.101
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/A	Pearson Correlation	.370**	-.668**	.327**	.390**	.210*	1	-.593**	-.227*	-.002	.141
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	.036		<.001	.023	.980	.160
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LR	Pearson Correlation	-.036	.507**	-.147	-.141	-.308**	-.593**	1	.209*	.012	-.100
	Sig. (2-tailed)	.725	<.001	.144	.161	.002	<.001		.037	.906	.320
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
FS	Pearson Correlation	-.053	.144	-.024	-.016	-.122	-.227*	.209*	1	-.313**	.094
	Sig. (2-tailed)	.602	.152	.811	.874	.229	.023	.037		.002	.354
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
AGR	Pearson Correlation	-.047	-.203*	.032	.053	-.044	-.002	.012	-.313**	1	-.142
	Sig. (2-tailed)	.639	.043	.751	.598	.667	.980	.906	.002		.159
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
T/R	Pearson Correlation	-.126	-.200*	.064	.038	.165	.141	-.100	.094	-.142	1
	Sig. (2-tailed)	.211	.046	.527	.710	.101	.160	.320	.354	.159	
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Source: Results are estimated by using data from Pharmaceutical Industry (20013–2022).

Table 5 shows the relationship between dependent variable (ROCE) and independent variables to examine the multicollinearity problems. Debt-equity ratio is positively related to profitability, liquidity, firm size and is negatively connected with long term-debt to equity ratio, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Long term-debt to equity ratio is positively related to profitability, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax and is negatively connected with liquidity, firm size. Short term-debt to equity ratio is positively related to profitability, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax and is negatively connected with liquidity, firm size.

Long term-debt to asset ratio is negatively related to profitability, liquidity, firm size, asset growth rate and is positively connected with short term-debt to asset, tax rate. Short term-debt to asset ratio is positively related to profitability, tax rate and is negatively connected with liquidity, firm size, asset growth rate.

Liquidity ratio is negatively related to profitability, tax rate and is positively connected with firm size, asset growth rate. Firm size is negatively related to profitability, asset growth rate and is positively connected with tax rate. Asset growth rate is negatively related to profitability, asset growth rate and is positively connected with tax rate. Tax rate is negatively related to profitability, (Rosario and Chavali, 2019).

Table 6. *Pearson Coefficient correlations of Variables (EPS used as Dependent variable)*

Correlations		EPS	D/E	LTD/E	STD/E	LTD/A	STD/A	LR	FS	AGR	T/R
EPS	Pearson Correlation	1	.056	-.144	-.050	-.393**	.070	-.004	-.251*	.053	-.090
	Sig. (2-tailed)		.579	.154	.620	<.001	.491	.970	.012	.599	.371
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
D/E	Pearson Correlation	.056	1	-.537**	-.482**	-.558**	-.668**	.507**	.144	-.203*	-.20*
	Sig. (2-tailed)	.579		<.001	<.001	<.001	<.001	<.001	.152	.043	.046
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/E	Pearson Correlation	-.144	-.537**	1	.959**	.395**	.327**	-.147	-.024	.032	.064
	Sig. (2-tailed)	.154	<.001		<.001	<.001	<.001	.144	.811	.751	.527
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/E	Pearson Correlation	-.050	-.482**	.959**	1	.153	.390**	-.141	-.016	.053	.038
	Sig. (2-tailed)	.620	<.001	<.001		.129	<.001	.161	.874	.598	.710
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LTD/A	Pearson Correlation	-.393**	-.558**	.395**	.153	1	.210*	-.308**	-.122	-.044	.165
	Sig. (2-tailed)	<.001	<.001	<.001	.129		.036	.002	.229	.667	.101
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
STD/A	Pearson Correlation	.070	-.668**	.327**	.390**	.210*	1	-.593**	-.227*	-.002	.141
	Sig. (2-tailed)	.491	<.001	<.001	<.001	.036		<.001	.023	.980	.160
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
LR	Pearson Correlation	-.004	.507**	-.147	-.141	-.308**	-.593**	1	.209*	.012	-.100
	Sig. (2-tailed)	.970	<.001	.144	.161	.002	<.001		.037	.906	.320
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
FS	Pearson Correlation	-.251*	.144	-.024	-.016	-.122	-.227*	.209*	1	-.313**	.094
	Sig. (2-tailed)	.012	.152	.811	.874	.229	.023	.037		.002	.354
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
AGR	Pearson Correlation	.053	-.203*	.032	.053	-.044	-.002	.012	-.313**	1	-.142

	Sig. (2-tailed)	.599	.043	.751	.598	.667	.980	.906	.002		.159
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
T/R	Pearson Correlation	-.090	-.200[*]	.064	.038	.165	.141	-.100	.094	-.142	1
	Sig. (2-tailed)	.371	.046	.527	.710	.101	.160	.320	.354	.159	
	N	3120	3120	3120	3120	3120	3120	3120	3120	3120	3120
**. Correlation is significant at the 0.01 level (2-tailed).											
*. Correlation is significant at the 0.05 level (2-tailed).											

Source: *Results are estimated by using data from Pharmaceutical Industry (20013–2022).*

Table 6 shows the relationship between dependent variable (EPS) and independent variables to examine the multicollinearity problems. Debt-equity ratio is positively related to profitability, liquidity, firm size and is negatively connected with long term-debt to equity ratio, short term-debt to equity ratio, long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Long term-debt to equity ratiois negatively related to profitability, liquidity, firm size and is positively connected with short term-debt to equity ratio,long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate. Short term-debt to equity ratiois negatively related to profitability, liquidity, firm size and is positively connected with long term-debt to asset ratio, short term-debt to asset, asset growth rate and tax rate.

Long term-debt to asset ratio is negatively related to profitability, short term debt to asset, tax rate and is positively connected with liquidity, firm size, asset growth rate. Short term-debt to asset ratio is negatively related to liquidity, firm size, asset growth rate and is positively connected withprofitability, tax rate. Liquidity ratio is negatively related to profitability, tax rate and is positively connected with firm size, asset growth rate.

Firm size is negatively related to profitability, asset growth rate and is positively connected with tax rate. Asset growth rateis negatively related to profitability, asset growth rate and is positively connected with tax rate. Tax rateis negatively related to profitability, (Vuongand and Mitra, 2017).

6.3 The Results of Linear Regression Model

Tables 7 displays the outcomes of a regression analysis for each dependent and independent variable.

Table 7. *Results of panel regression model (ROA)*

Coefficients[a]					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		

1	(Constant)	.062	.054			1.155	.251
	D/E	.085	.044	.309		1.926	.057
	LTD/E	.117	.071	1.482		1.643	.104
	STD/E	-.036	.022	-1.412		-1.622	.108
	LTD/A	-.459	.175	-.716		-2.615	.010
	STD/A	.094	.060	.247		1.577	.118
	LR	.003	.002	.170		1.573	.119
	FS	-.002	.002	-.080		-.866	.389
	AGR	.020	.026	.075		.776	.440
	T/R	-.013	.022	-.051		-.597	.552
a. Dependent Variable: ROA							
b. Predictors: (Constant), T/R, STD/E, FS, LTD/A, AGR, LR, STD/A, E/R, LTD/E							
Number of Observation		3120					
F		6.472					
Sig.		.001[b]					
R-squared		.393					
Adj. R-squared		.332					

Source: Own study.

Table 7 shows the impact of financing mix on financial performance of pharmaceutical industry in Bangladesh. This model reveals link between determinants of financial leverage and a measure of financial performance by ROA. The study finds that there is positively significant relationship between debt-equity ratio and financial performance as measured by ROA.

This relationship means that an increase in debt-equity ratio will increase the return on assets (ROA) and vice-versa. Guo *et al.* (2020) showed that the debt level has a positive impact on the profitability. Trade-off theory argues that a firm includes debt level in financing-mix at a point to pursue maximum level tax shields to optimize the financial benefits (Abor, 2005; Roden and Lewellen, 1995).

Long-term and short-term debt ratios insignificantly influence the financial performance as measured by ROA. The study indicates that financial performance using ROA is significantly determined by long-debt to asset ratio, not short-term debt to asset ratio. Liquidity, firm size, average growth rate and corporate tax rate are not found significant to influence the financial performance. However, the impact of financial leverage as measured by ROA is somewhat empirically established.

Table 8. Results of panel regression model (ROE)

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
2	(Constant)	.231	.093		2.493	.014

D/E	.005	.076	.006	.062	.951
LTD/E	.171	.122	.791	1.396	.166
STD/E	.010	.038	.139	.254	.800
LTD/A	-.729	.303	-.414	-2.407	.018
STD/A	-.003	.103	-.003	-.032	.975
LR	.001	.003	.024	.346	.730
FS	-.006	.004	-.100	-1.727	.088
AGR	.023	.044	.032	.524	.602
T/R	-.028	.039	-.039	-.719	.474

a. Dependent Variable: ROE	
b. Predictors: (Constant), T/R, STD/E, FS, LTD/A, AGR, LR, STD/A, E/R, LTD/E	
Number of Observation	3120
F	31.739
Sig.	.001[b]
R-squared	.760
Adj. R-squared	.736

Source: *Own study.*

The impact of financial leverage on the financial performance as measured by ROE is shown in Table 8. The findings indicate that financial performance as indicated by ROE insignificantly relies on the financial performance and its impact is positive.

Long and short-term debt to asset ratios are also found insignificant means that their impacts are negligible. Liquidity, firm size, average growth rate and corporate rate are none of them found significant to explain the financial performance in terms of return on equity. The results of this model reveal none of any significant for each variable.

Table 9. *Results of panel regression model (ROCE)*

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
3	**(Constant)**	.006	.091		.062	.951
	D/E	.149	.075	.315	1.987	.050
	LTD/E	.181	.121	1.337	1.504	.136
	STD/E	-.052	.038	-1.175	-1.369	.175
	LTD/A	-.708	.298	-.640	-2.373	.020
	STD/A	.540	.102	.820	5.301	.001
	LR	.003	.003	.112	1.047	.298
	FS	.000	.004	.009	.098	.922
	AGR	-.001	.043	-.003	-.033	.973
	T/R	-.047	.038	-.105	-1.239	.219
a. Dependent Variable: ROCE						
b. Predictors: (Constant), T/R, STD/E, FS, LTD/A, AGR, LR, STD/A, E/R, LTD/E						

Number of Observation	3120
F	6.953
Sig.	.001[b]
R-squared	.410
Adj. R-squared	.351

Source: Own study.

Table 9 demonstrates the explanatory power of independent variables to identify the impact of them on financial performance as measured by return on capital employed (ROCE). The study finds that debt-equity ratio significantly influences the financial performance as indicated by ROCE, and its impact is positive. This impact means that an increase in debt-equity ratio improves the financial performance and vice-versa.

According to the trade off theory, firms employ debt level at a point that maximizes the firm value to include tax-shield for interest-expense (Abor, 2005; Roden and Lewellen, 1995). Fama and French (2000) find that agency problem leads to an inverse relationship between debt and firm performance as agency problem is created between debt holders and shareholders.

Long and short-term debt ratios have no significant effects on financial performance as guided by ROCE, but long and short-term debt to asset ratios are significant to explain the financial performance. Moreover, the study finds that liquidity ratio, firm size, average growth rate, and corporate tax rate are not significant to influence the financial performance. Therefore, the financial performance as measured by ROCE is determined by financial leverage ratios.

***Table 10.** Results of panel regression model (EPS)*

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
4	**(Constant)**	81.688	16.871		4.842	.001
	D/E	-34.860	13.885	-.420	-2.511	.014
	LTD/E	54.544	22.317	2.294	2.444	.016
	STD/E	-17.828	7.006	-2.306	-2.545	.013
	LTD/A	-243.127	55.211	-1.255	-4.404	.001
	STD/A	13.321	18.847	.115	.707	.482
	LR	-.143	.549	-.029	-.261	.795
	FS	-2.317	.666	-.334	-3.478	.001
	AGR	-11.637	8.025	-.146	-1.450	.151
	T/R	-2.873	7.049	-.036	-.408	.685
a. Dependent Variable: EPS						
b. Predictors: (Constant), T/R, STD/E, FS, LTD/A, AGR, LR, STD/A, E/R, LTD/E						
Number of Observation		3120				
F		5.215				

Sig.	.001[b]
R-squared	.343
Adj. R-squared	.277

Source: Own study.

Table 10 reveals the impact of financial leverage on financial performance as symbolized by EPS. The study indicates that there is a significant relationship between debt-equity mix and financial performance as measured by EPS. This impact is supported by packing order theory predicts that firms prefer internal financing to external financing resulting to increase the profitability. Singh and Bansal (2016) argue that the debt-equity mix has a positive effect on financial performance as identically described by Ahmad *et al.* (2015).

Long-term debt ratio significantly influences the firm's profitability and its impact is positive. A unit of debt increases, the profit of a firm will increase by 0.54 units. This finding is supported to trade-off theory. So, the firm should use the debt at a point, where tax saving benefits is equal to the bankruptcy costs.

Moreover, the study finds that short-debt ratio is a leading factor to influence the profitability, and its impact is negative. Siahaan, Ragil, and Solimon, (2014) specify an inverse and insignificant relationship between leverage and profitability. Hasan *et al.* (2014) finds that the impact of financial leverage on profitability is negative and significant, which is investigated based on 36 listed firms for the period of 2007-2012. Liquidity has no effect on the profitability of pharmaceutical industry as measured by EPS, but firm size shows a significant impact on the firm's financial performance Majumder and Rahman, 2011).

A firm size is either measured as the natural logarithm of total assets or sales of the firm to represent its scope. A firm in large size is more dedicated in diversified services, investment, and production costs than small firms that are deprived of such facilities (Ahamed, 2017; Bougatef, 2017; SiewPeng and Mansor, 2017). This research also shows that average growth rate and corporate tax rate are found insignificant to lead to the profitability.

Therefore, the study used several models to identify the impact of financial leverage on financial performance of which financial measure of EPS is strongly influenced by financial leverage.

7. Conclusion

The research aims to investigate the impact of financial leverage on the financial performance of pharmaceutical industry. The impact of financial leverage on financial performance is examined by panel linear models using robust test. We find that the impact of debt-equity on financial performance (EPS) is significant and its connection is negative.

Diego García-Gómez *et al.* (2020) show an adverse effect of financing mix on financial performance, which agrees with the pecking order theory. This implies that the more debt-equity ratio reflects the less profitability of a firm. Financial performance, as measures of ROCE and ROA is significantly impacted by debt-equity ratio, and found a positive relationship. This result followed by trade-off theory predicts that a firm uses an optimal level of debt to have a tax shield on interest expense.

Singh and Bansal (2016) indicated that the debt-equity ratio has a significant impact on financial performance as same as the study of Ahmad *et al.* (2015). The study additionally shows that the long-term debt ratio significantly improved the firm's performance.

Compared to the results, Dalai (2018) finds an inverse relationship between short and long debts and profitability, with STDR and TDR having a positive effect on profitability. Chen (2020) demonstrated the effect of leverage on the financial performance of Chinese firms, which finds that the debt ratio is positively related to the firm's performance.

The long-debt-to-asset ratio shows a negative influence on the EPS of the pharmaceutical industry. This result is consistent with packing order theory, which predicts that a firm first focuses on the internal sources of capital, and then uses the external financing. The findings are consistent with earlier research by Siahaan, Ragil, and Solomon (2014), which found an adverse link between profitability and leverage.

According to Hasan *et al.'s* (2014) investigation, which used data from 36 publicly traded companies between the years 2007 and 2012; financial leverage has a negative and significant effect on profitability. This study provides evidence that firm size affects profitability. It suggests that a large corporation utilizes less debt because it has enough internal resources to carry out its operations, which is consistent with the trade-off theory.

In this study, liquidity shows an insignificant and negative connection with financial performance, which is consistent with the pecking order theory since a firm holds enough cash, it reduces its profitability. The average growth rate is found also insignificant and negative that means, financial performance is less affected by the average growth of assets or sales.

Moreover, financial performance is not influenced by corporate tax rates as firms in this industry are financed by internal funds, not external sources of finance. Therefore, the study confirms some evidence of financial leverage to determine the financial performance of the pharmaceutical industry in Bangladesh (Sedgwick, 2012).

8. Policy Implications

The results are analyzed and then derive some recommendations for policy implications and further studies:

(i) The study focused on the EPS of the companies, which is the main driver of equity investment. This finding might be more professional for firms that utilize less debt and for companies that lose money relative to the cost of debt. This context will suggest firms to accept the pecking order theory.

(ii) Debt policy should be made comparing with internal profitability and cost of debt such as the firms generate more return than the net interest rate, should finance more debt to have tax shield, will show higher financial performance. In this context, the trade-off theory will be more efficient for the firms.

(iii) Ownership structure and behavior require a set-up of professional management and governance to understand the comprehensive theories of financial structure to maximize the firm value or financial performance.

The study limits to a small sample size and covers a single sector, which might be true for a particular sector or particular environment, but not general for policy recommendations. The further study might be undertaken on "the impact of ownership behavior and governance on the financial decision".

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