



DETERMINANTS OF PROFITABILITY: A STUDY ON MANUFACTURING COMPANIES LISTED ON THE DHAKA STOCK EXCHANGE



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ABSTRACT

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This study aim to establish the crucial determinants of the profitability of manufacturing companies listed on the Dhaka Stock Exchange (DSE). Data were collected from different manufacturing companies listed on the DSE from 2014 to 2019. Pearson's correlation and ordinary least squares regression models were used to establish the relationship among profitability and different determinants of profitability such as liquidity, leverage, sales growth, management efficiency, capital intensity, firm size, working capital, annual inflation and GDP growth. The regression analysis results showed that liquidity and leverage have a statistically significant negative impact on profitability. On the other hand, managerial efficiency, sales growth and capital intensity have a statistically significant positive impact on profitability. The study also found that firm size, working capital, annual inflation and GDP growth have no significant impact on profitability. The study concludes that liquidity, leverage, managerial efficiency, sales growth and capital intensity are the strong determinants of profitability of the manufacturing companies. This paper consists of two major parts, the theoretical part and the empirical part. In the theoretical part, a brief discussion has been given about the different variables of profitability. The empirical part is based on a survey conducted on 34 manufacturing companies on the Dhaka Stock Exchange. Finally, some recommendations are made for the manufacturing companies regarding determinants of profitability. The policy implication is that potential investors should consider these determinants before making investment decisions in manufacturing companies.

Contribution/Originality: This study is one of the few studies that have investigated the determinants of profitability on manufacturing companies listed on the Dhaka Stock Exchange in Bangladesh and is one of the primary studies in Bangladesh that uses both micro and microeconomic factors of profitability in the manufacturing sector.

1. INTRODUCTION

The profitability of a company is based on its capacity to use its resources efficiently and effectively to generate income. Profitability is also considered an important indicator of the performance of a company and also means a better return for investors. On the other hand, poor profitability indicates poor performance, which will erode the capital, and if this situation prolongs the company ultimately ceases to exist. Expectation of a positive rate of return is an essential part of investment (Hossain, 2013). Potential investors and creditors always want to ensure that they

will get back their original investment and the return thereon. Investors can ensure this by examining performance and analyzing the indicators that are related to profitability. Some variables positively influence profitability and other variables negatively influence profitability. Changes in a company's earnings can be measured by comparing the amount of profit in a year with the amount of profit in the previous year (Scott, 2009).

Around 25% of companies on the DSE are manufacturing companies, which are the most important of the companies listed on the Dhaka Stock Exchange. In Bangladesh, the manufacturing sector plays a significant role in economic growth and sustainable development (Hossain, 2020) and a huge number of investors are investing in manufacturing companies. The determinants of profitability of manufacturing companies are different from other types of companies. This research will try to ascertain the determinants of profitability of manufacturing companies listed on the DSE in Bangladesh and the magnitude of the impact of these determinants on profitability.

Many investors use these determinants to forecast the future returns of their investments, and researchers across the globe have studied determinants of probability, but there is not much literature available regarding DSE. Therefore, this study will add value to the existing literature by identifying the crucial determinants of profitability and suggesting policy implications for these sectors. Moreover, the research findings can also be used as inputs for researchers interested in this area.

1.1. Objectives of the Study

The main objective of this research is to determine the influences of the selected variables on the profitability of the manufacturing companies listed on the DSE of Bangladesh. This study will attempt to accomplish the following specific objectives:

- i. To present the current scenario of the profitability of manufacturing companies listed on the DSE.
- ii. To find out the significant determinants of the profitability of manufacturing companies listed on the DSE.
- iii. To find out the impact of determinants on the profitability of manufacturing companies listed on the DSE.

2. LITERATURE REVIEW

Profitability of a company is the ability of a company to earn profit. Liuspita and Purwanto (2019) explain profitability as the achievement of the economic success of the company, which is generated after paying all costs directly related to income. Return on assets (ROA) is an indicator of how efficiently and effectively a company utilizes its assets to generate revenue. Fareed, Ali, Shahzad, Nazir, and Ullah (2016) concluded that return on assets is a proxy of profitability and return on equity (ROE) is a measure of the profitability of a company on the basis of equity.

Many researchers used ROA and ROE as measures of profitability, including Rezina, Ashraf, and Khan (2020); Prasetyantoko and Rachmadi (2008); Khan, Shamim, and Goyal (2018); Pratheepan (2014); Zaid, Wan Muhd, and Zulqernain (2014); Ehi-Oshio, Adeyemi, and Enofe (2013); Nanda and Panda (2018); Chen and Tseng (2005); Aissa and Lefa (2016); Liuspita and Purwanto (2019); Ifeduni and Charles (2018) and Yazdanfar (2013).

Profitability not only depends on the success of the product but also on the development of the market for the product and many other internal and external factors. Empirical studies that have examined the determinants of profitability of manufacturing companies resulting in mixed findings. Many variables have been considered as the determinants of profitability for different industries. Some researchers addressed microeconomic factors, such as firm size, leverage, current assets and sales growth as important determinants of profitability. Bourgeois III, Ganz, Gonce, and Nedell (2014) concluded that the firms within an industry have varying profitability levels relative to their size, growth rate, current assets, return on assets and economies of scale. Nusbantoro, Utami, and Sanjaya (2018) found that the working capital ratio, the ratio of interest payments, the gross profit ratio and the size of the company affect the profitability of the manufacturing companies on the Indonesian Stock Exchange.

According to Agustinus and Rachmadi (2008), firm size has a positive relationship to profitability and some other researchers including Prasetyantoko and Rachmadi (2008); Khan et al. (2018); Pratheepan (2014); Zaid et al. (2014); Ehi-Oshio et al. (2013); Nanda and Panda (2018); Chen and Tseng (2005); Aissa and Lefa (2016); Liuspita and Purwanto (2019); Ifeduni and Charles (2018) and Yazdanfar (2013) also found the same result.

Rezina et al. (2020) conducted a study on the cement industry in Bangladesh and concluded that GDP growth rate and real interest rate have significant positive impacts on profitability, while leverage has a significant negative relationship on profitability.

Hassan and Muniyat (2019) found a significant negative relationship between expense to revenue, inflation rate and company size to profitability, and a significant positive relationship between GDP growth and profitability. Egbunike and Okerekeoti (2018) also found a positive relationship between GDP growth and profitability.

Some researchers addressed the microeconomic factors and some macroeconomic factors, such as the country's gross domestic product, inflation rate, pricing policies, innovation and technological change, which are the important determinants of a company's profitability. According to McGivern and Tvorik (1997), organizational determinants of profitability deals with firms' overall performance, which implies that the profitability of an industry is determined by factors such as size, leverage, current assets, sales growth and macroeconomic environmental factors, such as the country's gross domestic product, inflation rate, pricing policies, innovation and technological change.

Inflation affects profits by reacting to sales volume by influencing the level of costs and by changing the relationship between cost and prices. Ali & Ibrahim (2018) and Pervan, Pervan, & Ćurak (2019) found a positive relationship between inflation rate and profitability of the Croatian manufacturing industry. The same thing was found by Akben-Selcuk (2016); Al-Jafari and Samman (2015); Tailab (2014) and Batra and Kalia (2016); however, Egbunike and Okerekeoti (2018) found a negative relationship between inflation and profitability.

Jariya (2013) found that total asset turnover and fixed asset turnover have a significant positive impact on profitability but working capital turnover has no significant relationship with profitability. Working capital is the crucial determinant of profitability. It was found that the size of working capital is not a vital determinant, but the components of working capital have a remarkable influence on profitability in different industries. Mittal, Joshi, and Shrimali (2010) found that there was no significant relationship in the size of working capital and profitability, but there was a significant positive relationship between the components of working capital and the profitability of firms in the cement industry in India. Bhunia (2010) and Al-Jafari & Samman (2015) found a positive relationship between working capital and profitability. Hossain (2020) concluded that efficiently and effectively managing working capital is very important for increasing manufacturing companies' profitability.

The leverage of a company is also considered as one of the important determinants of profitability. Researchers found that there is a mixed impact on performance of high and low financial leverage in the capital structure. Sangeetha and Sivathaasan (2013) found a significantly strong and positive relationship between profitability and leverage, but Soumadi and Hayajneh (2012) reported a negative impact of capital structure on the performance of companies in Jordan. Pouraghajan, Malekian, Emamgholipour, Lotfollahpour, and Bagheri (2012) found that there is a significant negative relationship between debt ratio and performance; on the other hand, there is a significant positive relationship among asset turnover, firm size, asset tangibility ratio and growth opportunities with profitability, and the relationship with a company's age is not significant.

Myers and Majluf (1984) found that there is a significant inverse relationship between leverage and profitability. Samarakoon (1999), Nunes, Serrasqueiro, and Sequeira (2009), Booth, Aivazian, Demircuc-Kunt, and Maksimovic (2001); Ifeduni and Charles (2018) and Al-Jafari and Samman (2015) also concluded that leverage is inversely related to profitability, but Jensen (1986), and later Sivathaasan, Tharanika, Sinthuja, and Hanitha (2013) and Ehi-Oshio et al. (2013), found that leverage is positively related to profitability.

Management efficiency is considered an important component of corporate management because it ensures the proper utilization of scarce resources of firms, which directly affects their profitability. Jamali and Asadi (2012) found that profitability and management efficiency are highly correlated with each other.

Liquidity is often defined as a firm's ability to settle short-term liabilities (Pervan et al., 2019). Egbunike and Okerekeoti (2018) and Prempeh, Sekyere, and Amponsah (2018) found a significant positive relationship between liquidity and profitability in Nigerian manufacturing firms. Chowdhury and Amin (2007), Hirsch and Hartmann (2014), Hirsch, Schiefer, Gschwandtner, and Hartmann (2014) and Zaid et al. (2014) also found the same result, while Sur and Chakraborty (2011) found no significant relationship, and Eljelly (2004) found a negative relationship.

Capital-intensive industries are required to take a high level of investment in fixed assets for starting up a business as well as for their overall functioning (Pervan et al., 2019). Goldar and Aggarwal (2005) found a positive relationship between capital intensity and profitability, while Dickinson and Sommers (2012) found a negative relationship.

Macroeconomic factors influence all aspects of an economy. Moaveni (2014) found that profitability and financial performance of the tourism industry are not affected significantly by macroeconomic factors. Hossain, Chowdhary, and Begum (2014) concluded that good performance of cottage industries can be indicated by the services provided by the workers.

2.1. Conceptual Framework

From the literature, the schematic conceptual model of the relationship between independent variables and profitability has been developed based on the survey, which is as follows:

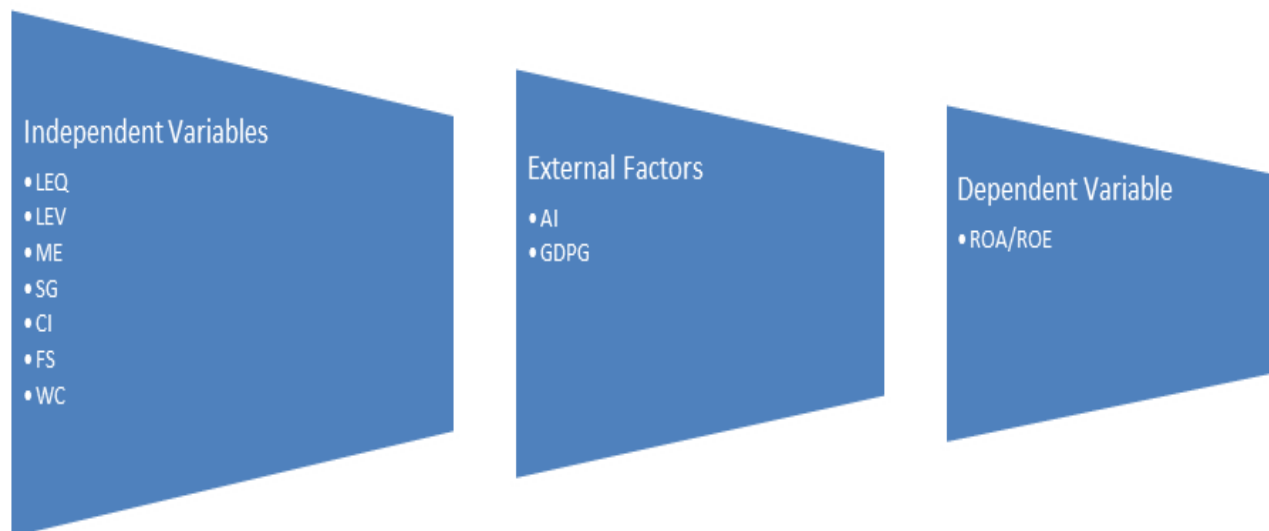


Figure 1. Schematic Conceptual Framework.

3. RESEARCH METHODOLOGY

3.1 Variables

To measure the impacts of profitability of firms, return on assets (ROA) and return on equity (ROE) are used as indicators of profitability, which are the ratio of earnings before interest and tax to total assets and total equity separately and determine the efficiency of using assets and owner's equity to generate earnings. Here, ROA and ROE are used as dependent variables.

Liquidity (LEQ), leverage (LEV), managerial efficiency (ME), sales growth (SG), capital intensity (CI), firm size (FS), working capital (WC), annual inflation (AI) and GDP growth (GDPG) are the independent variables, which

are used as a measurement of profitability. The variables, abbreviations and their measurements used in the analysis are as follows:

Table 1. List of Variables.

Variable	Abbreviation	Measurement
Return on asset	ROA	Earnings before tax and interest/Total assets
Return on equity	ROE	Earnings before tax and interest/Total equity
Liquidity	LEQ	Current assets/Current liabilities
Leverage	LEV	Total liabilities/Total assets
Management efficiency	ME	Total revenue/Total assets
Sales growth	SG	(Salest – Salest-1)/Salest-1
Capital intensity	CI	Total Asset/Total revenue
Working capital	WC	Current assets – Current liabilities
Firm size	FS	Ln (Total assets)
Annual inflation	AI	Annual average increase in the Bangladeshi consumer price index
GDP annual growth	GDPG	Annual real GDP growth rate

3.2. Research Instruments

This research is mainly exploratory in nature and some variables relating to the profitability of the manufacturing companies have been identified through the literature review. The following nine variables were selected as profitability influencers of companies: liquidity (LEQ), leverage (LEV), management efficiency (ME), sales growth (SG), capital intensity (CI), working capital (WC), firm size (FS), annual inflation (AI) and GDP growth (GDPG). While these variables have been treated as the independent variables, profitability is considered the dependent variable measured by return on equity (ROE) and return on assets (ROA).

3.3. Population, Sample, and Data Collection

The Dhaka Stock Exchange (DSE) has 126 manufacturing companies and 34 manufacturing companies were randomly selected from different sectors. A total of 196 firm years are used as panel data for the required analysis. All the numerical data of these selected firms were obtained from the companies' published annual reports from 2014 to 2019.

3.4. Data Analysis Procedures and Hypotheses:

The different statistical outputs were computed by using SPSS statistical software. Descriptive statistical techniques, including mean scores and standard deviation, were used to assess each variable's importance. For testing hypotheses, OLS regression analysis was conducted to determine whether there is a significant relationship between different independent variables and profitability. The study will test the following hypotheses:

- i. H_{0i} : There is a statistically significant relationship between liquidity (LEQ) and profitability.
- ii. H_{0ii} : There is a statistically significant relationship between leverage (LEV) and profitability.
- iii. H_{0iii} : There is a statistically significant relationship between managerial efficiency (ME) and profitability.
- iv. H_{0iv} : There is a statistically significant relationship between sales growth (SG) and profitability.
- v. H_{0v} : There is a statistically significant relationship between capital intensity (CI) and profitability.
- vi. H_{0vi} : There is a statistically positive significant relationship between firm size (FS) and profitability.
- vii. H_{0vii} : There is a statistically positive significant relationship between working capital (WC) and profitability.
- viii. H_{0viii} : There is a statistically positive significant relationship between annual inflation (AI) and profitability.
- ix. H_{0ix} : There is a statistically positive significant relationship between GDP growth (GDPG) and profitability.

3.5. Model Specification

The firm's profitability (ROA and ROE) is modeled as a function of the nine aforementioned core profitability measures. The effects of a firm's profitability are modeled using the following OLS regression equations to obtain the estimates:

$$ROA = f(LEQ, LEV, ME, SG, CI, FS, WC, AI, GDPG)$$

$$ROE = f(LEQ, LEV, ME, SG, CI, FS, WC, AI, GDPG)$$

$$\text{Model 1: } ROA_{it} = \beta_0 + \beta_1 LEQ_{it} + \beta_2 LEV_{it} + \beta_3 SG_{it} + \beta_4 ME_{it} + \beta_5 CI_{it} + \beta_6 FS_{it} + \beta_7 WC_{it} + \beta_8 AI_{it} + \beta_9 GDPG_{it} + \varepsilon_{it}$$

$$\text{Model 2: } ROE_{it} = \beta_0 + \beta_1 LEQ_{it} + \beta_2 LEV_{it} + \beta_3 SG_{it} + \beta_4 ME_{it} + \beta_5 CI_{it} + \beta_6 FS_{it} + \beta_7 WC_{it} + \beta_8 AI_{it} + \beta_9 GDPG_{it} + \varepsilon_{it}$$

Where ROA denotes the return on assets, ROE is the return on equity, LEQ is the liquidity, LEV is the leverage, ME is the management efficiency, SG is the sales growth, CI is the capital intensity, FS is the firm size, WC is the working capital, AI is the annual inflation, GDPG is the gross domestic product growth, ε is the error term of the model and $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8,$ and β_9 are the regression model coefficients. The subscript i indicates firms and t indicates years.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1. Descriptive Statistics

The descriptive analysis shows the mean and standard deviation.

Table 2. Descriptive statistics of variables.

	N	Mean	Std. Deviation
ROA	196	0.083869	0.0834333
ROE	196	0.157237	0.1438423
LEQ	196	2.9730	4.87008
LEV	196	0.4428	0.23087
ME	196	0.8238	0.82634
SG	162	0.1173	0.35774
CI	196	3.4141	9.11438
FS	196	10.7775	1.62600
WC	196	14320.0406	34863.56256
AI	196	0.0590	0.00512
GDPG	196	0.0726	0.00738
Valid N (list wise)	162		

Table 2 represents the summary statistics of the variables used in the present study for 196 firm years. It shows that the average ROA is 8.38% with a standard deviation of 8.34% and that the mean value of ROE is 15.72% with a standard deviation of 14.38%. The average LEQ is 2.97 with a standard deviation of 4.87 and the mean LEV is 44.28% with a standard deviation of 23.08%. Typical firms have a SG of almost 11.73% annually on average with a standard deviation of 35.77%. We can also see that CI is 3.41 with a standard deviation of 9.11, the average FS is 10.77 with a standard deviation of 1.62, the mean WC is 14320.04 with a standard deviation of 34863.56, the AI is 5.90% with a standard deviation of 0.52% and GDPG is 7.26 with a standard deviation of 0.73%.

4.2. Correlations Analysis

Table 3. Correlation Matrix.

Variables	ROA	ROE	LEQ	LEV	SG	ME	FS	CI	WC	AI	GDPG
ROA	1										
Sig. (2-tailed)											
ROE	0.854**	1									
Sig. (2-tailed)	0.000										
LEQ	0.045	-0.144*	1								
Sig. (2-tailed)	0.533	0.044									
LEV	-0.315**	0.117	-0.610**	1							
Sig. (2-tailed)	0.000	0.104	0.000								
SG	0.126	0.176*	-0.081	0.126	1						
Sig. (2-tailed)	0.110	0.025	0.308	0.110							
ME	0.510**	0.638**	-0.148*	0.202**	0.027	1					
Sig. (2-tailed)	0.000	0.000	0.038	0.005	0.736						
FS	0.105	0.183*	-0.050	0.095	0.100	-0.048	1				
Sig. (2-tailed)	0.142	0.010	0.490	0.185	0.206	0.506					
CI	-0.161*	0.093	-0.043	0.291**	-0.009	-0.242**	0.357**	1			
Sig. (2-tailed)	0.024	0.196	0.548	0.000	0.907	0.001	0.000				
WC	0.183*	0.208**	0.105	-0.067	-0.032	0.097	0.547**	0.349**	1		
Sig. (2-tailed)	0.010	0.003	0.141	0.350	0.688	0.174	0.000	0.000			
AI	0.039	0.030	-0.030	-0.036	-0.004	0.049	-0.106	-0.061	-0.085	1	
Sig. (2-tailed)	0.588	0.673	0.674	0.614	0.961	0.499	0.139	0.394	0.235		
GDPG	-0.075	-0.060	0.000	0.057	-0.047	-0.063	0.117	0.050	0.100	-0.847**	1
Sig. (2-tailed)	0.295	0.401	0.998	0.424	0.551	0.384	0.103	0.486	0.165	0.000	

Note: ** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

From Table 3, it is clear that the ROA is negatively related to LEV, CI and GDPG. The results also show that the ROA is positively associated with LEQ, ME, SG, FS, AI and GDPG. The correlation coefficient of LEV, ME, CI and WC are significant, and CI, AI and GDPG are not significant.

Table 3 also shows that the ROE is negatively related to LEQ and GDPG and positively related to SG, CI, ME, FS, WC, AI and LEV. The correlation coefficients of SG, LEQ, ME, FS, WC and LEV are significant, while the correlation coefficients of CI, AI and GDPG are not significant.

4.3. Regression Analysis

For testing hypotheses, an OLS regression analysis was conducted to determine whether there is a significant relationship among the dependent variables ROA and ROE and independent variables GDPG, SG, CI, LEQ, ME, FS, WC, AI and LEV. The beta coefficient may be negative or positive; beta indicates each variable's level of influence on the dependent variable. The P-value indicates at what percentage each variable is significant and the R-squared value measures how well the regression model explains the actual variations in the dependent variable.

Table 4. Model summary for dependent variable ROA.

Model	R	R Square	Adjusted R Squared	Std. Error of the Estimate	Durbin Watson	F	Sig.
1	0.745a	0.555	0.529	0.0579237	0.742	21.073	0.000a

Note:

a. Predictors: (constant), GDPG, SG, CI, LEQ, ME, FS, WC, AI and LEV.

b. Dependent variable: ROA

Table 5. Coefficients for dependent variable ROA.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.211	0.221		0.954	0.342
	LEQ	-0.004	0.001	-0.276	-3.913	0.000
	LEV	-0.258	0.028	-0.712	-9.068	0.000
	ME	0.067	0.006	0.653	10.534	0.000
	SG	0.039	0.013	0.164	2.971	0.003
	CI	0.001	0.001	0.161	2.346	0.020
	FS	0.005	0.004	0.103	1.517	0.131
	WC	-6.029E-8	0.000	-0.026	-0.365	0.716
	AI	-1.181	2.652	-0.034	-0.445	0.657
	GDPG	-0.712	1.124	-0.049	-0.634	0.527

Note: a. Dependent variable: ROA.

Table 4 shows the impact of independent variables on the dependent variable ROA. Here, the adjusted R-squared of .555 indicates that the independent variables explain the dependent variable ROA 55.5%. The Durbin-Watson value of .742 indicates the unlikelihood of autocorrelation.

Table 4 also shows that the f-statistic value of 21.073 is statistically significant at a 1% significance level with df nine and a p-value of 0.00. This implies that the null hypothesis is rejected. There is no significant relationship between the dependent and independent variables, so we can argue that there is a significant relationship among GDPG, SG, CI, LEQ, ME, FS, WC, AI, LEV and ROA.

Table 5 shows the coefficient value of the regression analysis. These coefficients illustrate to what extent each independent variable impact ROA. The beta coefficient of LEQ is -0.276 with a p-value of 0.000, which is statistically negatively significant at the 1% level, but varies from the findings of Egbunike and Okerekeoti (2018); Prempeh et al. (2018); Chowdhury and Amin (2007) and Zaid et al. (2014). This means that liquidity negatively impacts ROA. The beta coefficient of LEV is -0.712 with a p-value of 0.000 and is statistically significant at the 1% level. It also means leverage statistically negatively impacts ROA.

The beta coefficient of ME is 0.653 with a p-value of .000, which is statistically significant at the 1% level (Jamali & Asadi, 2012), which means managerial efficiency has a significant positive impact on ROA. The beta coefficient of SG is .164 with a p-value of .003, which is statistically significant at the 1% level. This means that sales growth has a significant positive impact on ROA. The beta coefficient of CI is 0.161 with a p-value of .020, which is statistically positively significant at a 5% level, supporting Goldar & Aggarwal (2005) and contradicting Dickinson & Sommers (2012). This means that capital intensity has a significant positive impact on ROA.

The beta coefficient of FS, WC, AI and GDPG are 0.103, -0.026, -0.034 and -0.049 with p-values of 0.131, 0.716, 0.657 and 0.527, respectively, which are statistically not significant.

In conclusion, it can be said that liquidity, leverage, sales growth, managerial efficiency and capital intensity have a significant impact on ROA. In contrast, firm size, working capital, annual inflation and GDP growth do not have a significant impact on ROA.

From Table 5, the regression model can be retrieved as follows:

$$\text{Model 1: ROA}_{it} = \beta_0 + \beta_1 \text{LEQ}_{it} + \beta_2 \text{LEV}_{it} + \beta_3 \text{SG}_{it} + \beta_4 \text{ME}_{it} + \beta_5 \text{CI}_{it} + \varepsilon_{it}$$

$$\text{Model 1: ROA} = 0.211 - 0.276 \text{LEQ}_{it} - 0.712 \text{LEV}_{it} + 0.164 \text{SG}_{it} + 0.653 \text{ME}_{it} + 0.161 \text{CI}_{it} + \varepsilon_{it}$$

Table 6. Model summary for dependent variable ROE.

Model	R	R Square	Adjusted R Squared	Std. Error of the Estimate	Durbin-Watson	F	Sig.
1	0.734 ^a	0.538	0.511	0.0980532	0.805	19.690	0.000 ^a

a. Predictors: (constant), GDPG, SG, CI, LEQ, ME, FS, WC, AI and LEV.

b. Dependent variable: ROE

Table 7. Coefficients for Dependent Variable ROE.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.180	0.375		0.482	0.631
	LEQ	-0.005	0.002	-0.177	-2.466	0.015
	LEV	-0.168	0.048	-0.279	-3.487	0.001
	ME	0.128	0.011	0.745	11.807	0.000
	SG	0.066	0.022	0.169	2.994	0.003
	CI	0.005	0.001	0.322	4.615	0.000
	FS	0.007	0.006	0.084	1.214	0.227
	WC	-1.189E-7	0.000	-0.031	-0.425	0.672
	AI	-1.070	4.490	-0.018	-0.238	0.812
	GDPG	-1.057	1.902	-0.043	-0.556	0.579

Note: a. Dependent variable: ROE.

Table 6 shows the impact of independent variables on the dependent variable ROE. Here, the adjusted R-squared of .535 indicates that the independent variables explain the dependent variable ROE 53.5%. The Durbin-Watson value of .805 indicates the unlikelihood of autocorrelation.

Table 6 also shows the f-statistic value of 19.690 is statistically significant at the 1% significance level with df nine and p-value of 0.00, which implies that the hypothesis that there is no significant relationship between the dependent and independent variables is rejected. So we can argue that there is a significant positive relationship among GDPG, SG, CI, LEQ, ME, FS, WC, AI, LEV and ROE.

Table 7 shows the coefficient value of the regression analysis. These coefficients illustrate to what extent each independent variable impacts return on equity. The beta coefficient of LEQ is -0.177 with a p-value of .015, which is statistically significant at the 5% level. This means that liquidity negatively impacts ROE but contradicts Egbunike and Okerekeoti (2018); Prempeh et al. (2018); Chowdhury and Amin (2007) and Zaid et al. (2014). The beta coefficient of LEV is -0.279 with a p-value of 0.001, which is statistically significant at the 1% level. It also means that leverage statistically negatively impacts ROE.

The beta coefficient of ME is .745 with a p-value of .000, which is statistically significant at a 1% level, supporting the result of Jamali and Asadi (2012). This means that managerial efficiency has a significant positive impact on ROA. The beta coefficient of SG is .169 with a p-value of .003, which is statistically significant at the 1% level. This means That sales growth has a significant positive impact on ROA, supporting Jamali & Asadi (2012). The Beta coefficient of CI is 0.322 with a p-value of .000, which is statistically significant at 1% level supporting (Goldar & Aggarwal, 2005) and varying (Dickinson & Sommers, 2012). It means Capital Intensity has a significant positive impact on ROA.

The beta coefficient of FS, WC, AI, and GDPG are 0.084, -0.031, -0.018, and -0.043 with a p-value of 0.227, 0.672, 0.812, and 0.579, respectively which are statistically not significant.

So finally, it can be said that Liquidity, Leverage, Sales Growth, Managerial Efficiency, and Capital Intensity have a significant impact. In contrast, Firm Size, Working Capital, Annual Inflation, and GDP Growth do not have significant impact ROE.

From Table 7, the regression model can be retrieved as follows:

Model 2: $ROE_{it} = \beta_0 + \beta_1 LEQ_{it} + \beta_2 LEV_{it} + \beta_3 SG_{it} + \beta_4 ME_{it} + \beta_5 CI_{it} + \varepsilon_{it}$

Model 2: $ROE = .180 - 0.177LEQ_{it} - 0.279LEV_{it} + 0.169SG_{it} + 0.745ME_{it} + 0.322CI_{it} + \varepsilon_{it}$

5. CONCLUSIONS

This study aimed to identify the significant factors that determine the manufacturing sector's profitability and the extent to which these determinants impact profitability. Some determinants that significantly impact profitability were found from reviewing previous studies. The following was concluded from the empirical findings.

First, liquidity has a statistically significant negative relationship with profitability, supporting Eljelly (2004), but varying from Egbunike and Okerekeoti (2018); Prempeh et al. (2018); Chowdhury and Amin (2007); Hirsch and Hartmann (2014); Hirsch et al. (2014) and Zaid et al. (2014). It indicates that higher liquidity decreases profitability. Leverage also has a statistically significant negative relationship with profitability, supporting Myers and Majluf (1984); Samarakoon (1999); Nunes et al. (2009). Booth et al. (2001); Ifeduni and Charles (2018) and Al-Jafari and Samman (2015), but varying from Jensen (1986); Sivathaasan et al. (2013) and Ehi-Oshio et al. (2013).

Second, sales growth has a statistically significant positive relationship with profitability, supporting McGivern & Tvorik (1997). Managerial efficiency also has a statistically significant positive relationship with profitability (Jamali and Asadi, 2012). Capital intensity shows a statistically significant positive relationship with profitability, supporting Goldar & Aggarwal (2005) and varying from Dickinson & Sommers (2012).

Third, firm size has no statistically significant positive relationship with profitability, supporting Agustinus and Rachmadi (2008); Prasetyantoko and Rachmadi (2008); Khan et al. (2018); Pratheepan (2014); Zaid et al. (2014); Ehi-Oshio et al. (2013); Nanda and Panda (2018); Chen and Tseng (2005); Aissa and Lefa (2016); Liuspita and Purwanto (2019); Ifeduni and Charles (2018) and Yazdanfar (2013).

Working capital has no statistically significant negative relationship with profitability, supporting Jariya (2013) and Mittal et al. (2010), but varying from Al-Jafari and Samman (2015) and Nusbantoro et al. (2018). Annual inflation has no statistically significant negative relationship with profitability, supporting Hassan & Muniyat (2019) but varying from Pervan et al. (2019). GDP growth has no statistically significant negative relationship with profitability, varying from Rezina et al. (2020); Hassan and Muniyat (2019) and Egbunike and Okerekeoti (2018). To conclude, these are not strong determinants of profitability.

6. RECOMMENDATIONS

Based on the findings of this study, I propose the following recommendations:

- The result of a significant negative relationship between liquidity and profitability leads to a decrease in profitability, which means a lack of proper management of liquidity. So, based on this study, manufacturing companies should maintain proper liquidity to increase profitability.
- The negative relationship between leverage and profitability leads to a decrease in profitability, which means a lack of proper management of leverage. So, based on this study, manufacturing companies should maintain appropriate financing to increase profitability.
- The positive relationship between management efficiency and profitability leads to an increase in profitability, which means that if management can utilize resources efficiently, it will lead to increased profitability. So, based on this study, manufacturing companies should ensure operational management efficiency to increase profitability.

- The positive relationship between sales growth and profitability leads to an increase in profitability, so based on this study, manufacturing companies should ensure sufficient sales to increase profitability.
- The positive relationship between capital intensity and profitability leads to an increase in profitability, so based on this study, manufacturing companies should ensure capital intensity to increase profitability.

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REFERENCES

- Agustinus, P., & Rachmadi, P. (2008). Determinants of corporate performance of listed companies in Indonesia. MPRA Paper.
- Aissa, S. B., & Lefa, M. G. (2016). *Determinants of tunisian hotel profitability: The role of managerial efficiency*, . IHEC Carthage,: University of Carthage, Tunisia.
- Akben-Selcuk, E. (2016). Does firm age affect profitability, Evidence from turkey. *International Journal of Economic Sciences*, 5(3), 1-9.
- Al-Jafari, M. K., & Samman, H. A. (2015). Determinants of profitability: evidence from industrial companies listed on muscat securities market. *Journal of European Studies*, 7(11), 303-311. Available at: 10.5539/RES.V7N11P303.
- Ali, M., & Ibrahim, P. (2018). Inflation and companies' performance: A cross-sectional analysis. *Advanced Science Letters*, 24(6), 4750-4755. Available at: <https://doi.org/10.1166/asl.2018.11694>.
- Batra, R., & Kalia, A. (2016). Rethinking and redefining the determinants of corporate profitability. *Global Business Review*, 17(4), 921-933.
- Bhunia, A. (2010). A study of liquidity trends on private sector steel companies in India. *Asian Journal of Management Research*, 6(1), 618-628.
- Booth, L., Aivazian, V., Demirguc-Kunt, A., & Maksimovic, V. (2001). Capital structures in developing countries. *The Journal of Finance*, 56(1), 87-130.
- Bourgeois III, L. J., Ganz, A., Gonce, A., & Nedell, K. (2014). Profitability of industries and firms over time. *Journal of Strategy and Management*, 7(3), 210-225. Available at: <https://doi.org/10.1108/JSMA-04-2014-0027>.
- Chen, H.-M., & Tseng, C.-H. (2005). The performance of marketing alliances between the tourism industry and credit card issuing banks in Taiwan. *Tourism Management*, 26(1), 15-24. Available at: <https://doi.org/10.1016/j.tourman.2003.08.018>.
- Chowdhury, A., & Amin. (2007). Working capital management practiced in pharmaceutical companies listed in Dhaka stock exchange. *BRAC University Journal*, 4(2), 75-86.
- Dickinson, V., & Sommers, G. A. (2012). Which competitive efforts lead to future abnormal economic rents? Using accounting ratios to assess competitive advantage. *Journal of Business Finance & Accounting*, 39(3-4), 360-398. Available at: 10.1111/j.1468-5957.2012.02283.x.
- Egbunike, C. F., & Okerekeoti, C. U. (2018). Macroeconomic factors, firm characteristics and financial performance. *Asian Journal of Accounting Research*, 3(2), 142-168.
- Ehi-Oshio, O. U., Adeyemi, A., & Enofe, A. O. (2013). Determinants of corporate profitability in developing economies. *European Journal of Business and management*, 5(16), 42-50.
- Eljelly, A. M. (2004). Liquidity-profitability tradeoff: An empirical investigation in an emerging market. *International Journal of Commerce and Management*, 14(2), 48-62. Available at: 10.1108/10569210480000179.
- Fareed, Z., Ali, Z., Shahzad, F., Nazir, M. I., & Ullah, A. (2016). Determinants of profitability: Evidence from power and energy sector. *Studia Universitatis Babeş-Bolyai Oeconomica*, 61(3), 59-78. Available at: <https://doi.org/10.1515/subboec-2016-0005>.
- Goldar, B., & Aggarwal, S. C. (2005). Trade liberalization and price-cost margin in Indian industries. *The Developing Economies*, 43(3), 346-373. Available at: 10.1111/j.1746-1049.2005.tb00949.x.

- Hassan, S. R., & Muniyat, S. (2019). *Factors influencing the profitability of pharmaceutical companies in Bangladesh*. Paper presented at the International Conference on Business and Management.
- Hirsch, S., & Hartmann, M. (2014). Persistence of firm-level profitability in the European dairy processing industry. *Agricultural Economics*, 45(S1), 53-63. Available at: 10.1111/agec.12129.
- Hirsch, S., Schiefer, J., Gschwandtner, A., & Hartmann, M. (2014). The determinants of firm profitability differences in EU food processing. *Journal of Agricultural Economics*, 65(3), 703-721. Available at: 10.1111/1477-9552.12061.
- Hossain, T. (2013). An empirical study on investment decision using CAPM in the instruments of banking companies under DSE. *G-Science, JSERD*, 10(1), 1427-1431.
- Hossain, T. (2020). The effect of working capital management on profitability. *International Journal of Research in Business and Social Science (2147- 4478)*, 9(6), 114-122. Available at: <https://doi.org/10.20525/ijrbs.v9i6.872>.
- Hossain, T., Chowdhary, H. J., & Begum, F. (2014). Khadi Cottage industry in Bangladesh: A study on Comilla. *The Journal of Rural Development*, 39(2), 121-141.
- Ifeduni, A. S., & Charles, O. (2018). The determinants of profitability of manufacturing firms In Nigeria. *International Journal of Economics, Commerce, and Management, United Kingdom*, 6(4), 479-493.
- Jamali, A. H., & Asadi, A. (2012). Management efficiency and profitability in Indian automobile industry: From theory to practice. *Indian Journal of Science and Technology*, 5(5), 2779-2781. Available at: <https://doi.org/10.17485/ijst/2012/v5i5.21>.
- Jariya, H. (2013). *Liberia - economic governance & institutional reform: Implementation Status Results Report: Sequence 09*. Washington, D.C: World Bank Group.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2), 323-329.
- Khan, T., Shamim, M., & Goyal, J. (2018). Panel data analysis of profitability determinants: Evidence from Indian telecom companies. *Theoretical Economics Letters*, 8(15), 3581-3593. Available at: <https://doi.org/10.4236/tel.2018.815220>.
- Liuspita, J., & Purwanto, E. (2019). The profitability determinants of food and beverages companies listed at the Indonesia stock exchange. *International Journal of Scientific & Technology Research*, 8(9), 197-202.
- McGovern, M. H., & Tvorik, S. J. (1997). Determinants of organizational performance. *Management Decision*, 35(6), 417-435. Available at: <https://doi.org/10.1108/00251749710173797>.
- Mittal, S., Joshi, N., & Shrimali, K. (2010). *Empirics on working capital management; a case of Indian cement industry*. Paper presented at the International Conference on Humanities, Economics and Geography (ICHEG'2012) March 17-18, 2012 Bangkok, 212-216.
- Moaveni, G. (2014). *Determinants of profitability in tourism industry: Evidence from Turkey*. A Thesis Submitted for the Degree Master of Science in Banking and Finance, Eastern Mediterranean University, Gazimağusa, North Cyprus.
- Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.
- Nanda, S., & Panda, A. K. (2018). The determinants of corporate profitability: An investigation of Indian manufacturing firms. *International Journal of Emerging Markets*, 13(1), 66-86. Available at: <https://doi.org/10.1108/ijjoem-01-2017-0013>.
- Nunes, P. J. M., Serrasqueiro, Z. M., & Sequeira, T. N. (2009). Profitability in Portuguese service industries: A panel data approach. *The Service Industries Journal*, 29(5), 693-707.
- Nusbantoro, A. J., Utami, E. S., & Sanjaya, N. A. (2018). The determinants of profit change in manufacturing companies at the Indonesian Stock Exchange. *Review of Management and Entrepreneurship*, 2(1), 17-30.
- Pervan, M., Pervan, I., & Ćurak, M. (2019). Determinants of firm profitability in the Croatian manufacturing industry: evidence from dynamic panel analysis. *Economic research-Ekonomska istraživanja*, 32(1), 968-981. Available at: <https://doi.org/10.1080/1331677X.2019.1583587>.

- Pouraghajan, A., Malekian, E., Emamgholipour, M., Lotfollahpour, V., & Bagheri, M. (2012). The relationship between capital structure and firm performance evaluation measures: Evidence from the tehran stock exchange. *International Journal of Business and Commerce*, 1(9), 166-181.
- Prasetyantoko, A., & Rachmadi, P. (2008). *Determinants of corporate performance of listed companies in Indonesia*. Germany: University Library of Munich.
- Pratheepan, T. (2014). A panel data analysis of profitability determinants: Empirical results from Sri Lankan manufacturing companies. *International Journal of Economics, Commerce and Management*, 2(12), 1-9.
- Prempeh, K., Sekyere, A. M., & Amponsah, A. E. K. (2018). A multivariate analysis of determinants of profitability: Evidence from selected manufacturing companies listed on the Ghana stock exchange. Retrieved from: <https://ssrn.com/abstract=3096972> or <http://dx.doi.org/10.2139/ssrn.3096972>. [Accessed January 5, 2018].
- Rezina, S., Ashraf, A., & Khan, M. A. (2020). An inferential study on the profitability determinants of the cement industry in Bangladesh. *Asian Finance & Banking Review*, 4(2), 8-21.
- Samarakoon, L. P. (1999). The capital structure of Sri Lankan companies. *Sri Lankan Journal of Management*, 4(1&2), 18-30.
- Sangeetha, M., & Sivathaasan, N. (2013). Factors determining capital structure: A case study of listed companies in Sri Lanka. *Research Journal of Finance and Accounting*, 4(6), 236-247.
- Scott, W. R. (2009). *Financial accounting theory* (5th ed.). Ontario, CA: Prentice Hall.
- Sivathaasan, N., Tharanika, R., Sinthuja, M., & Hanitha, V. (2013). Factors determining profitability: A study of selected manufacturing companies listed on Colombo Stock Exchange in Sri Lanka. *European Journal of Business and management*, 5(27), 99-107.
- Soumadi, M. M., & Hayajneh, O. S. (2012). Capital structure and corporate performance empirical study on the public Jordanian shareholdings firms listed in the Amman stock market. *European Scientific Journal*, 8(22), 173-189.
- Sur, D., & Chakraborty, K. (2011). Evaluating Relationship of Working Capital and Profitability: A Study of Select Multinational Companies in the Indian Pharmaceutical Sector. *IUP Journal of Management Research*, 10(2), 7-22.
- Tailab, M. (2014). The effect of capital structure on profitability of energy American firms. *International Journal of Business and Management Invention*, 3(12), 54-61.
- Yazdanfar, D. (2013). Profitability determinants among micro firms: evidence from Swedish data. *International Journal of Managerial Finance*, 9(2), 151-160.
- Zaid, M. N., Wan Muhd, F. I., & Zulqernain, S. N. (2014). *The determinants of profitability: Evidence from Malaysian construction companies*. Paper presented at the 5th Asia-Pacific Business Research Conference. Kuala Lumpur: Minister of Works Malaysia.

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