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FREE CASH FLOW AND PROFITABILITY: A STUDY ON DHAKA STOCK EXCHANGE LISTED FIRMS

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ABSTRACT
The main purpose of this study is to investigate the relationship between free cash flows and profitability of the Dhaka stock exchange (DSE) listed non-financial firms. The study adopted an econometric model and applied on the profitability and explanatory variables of the 30 sampled DSE listed firms of Bangladesh. The study revealed that there are a positive and statistically 1% level of significant relationship exist between the free cash flows and profitability of the samples firms. It is suggested that the DSE listed non-financial firms are properly using their free cash flows for generating future profits which has turned into shareholders wealth. The finding also indicates there are no agency problem between the managers and shareholders of the firms in this issue. In addition, it is investigated the capital liquidity and firm size have positive and significant impacts on the firms' profitability. The findings of this study may lend a strong policy support for the policymakers and practitioners for the continuation of the firms' profitability and utilization of their free cash flows. Further, the findings may support the academician and investors for further research and investment on the DSE listed firms' of Bangladesh

1. INTRODUCTION

Free cash flow (FCF) is a measure of how much cash a business generates after accounting for capital expenditures such as buildings or equipment. Further, FCF shows the amount of cash the company allocates or budgets after spending for maintenance or development of property. It is for reinvestment, after fulfilling the requirements of the business, such cash flow which is extra or free, is referred to as free cash flow. This cash can be used for expansion, dividends, reducing debt, or other purposes. FCF can also be defined as cash available for resource provider. FCF is one of the key tools for measuring the financial performance of business unit and shows the cash that company has after performing the necessary costs for maintenance or development of assets (Habib, 2011). FCF can have important applications for shareholders in assessing the financial soundness of the business unit. Since, proper management of working capital components enables the firms to hold excess free cash flows which can in turn be investment in profitable projects to generate profits for the firm. Cutting of costs has a significant effect on FCF held by the firm; this permits the firm to have additional finances to take advantage of profitable investment projects that can yield higher returns. FCF does not only impact on revenues and profitability of the firm but also the management of the balance sheet. If the firm fails to manage its net working capital properly then free cash flows might be lower than the net earnings of

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the firm.

Free cash flows and profitability of a firm has a significant positive relationship (Hubbard, 1998), an increase in the level of cash flow of a firm leads to a corresponding increase in profits of the firm. This is achieved through investing. The firm should consider making key investment decisions to use of additional cash flows. For example, firms that hold excess cash might use it in buying overpriced firms rather than paying out dividends to the shareholders. This is possible even when the firms have a low financial capacity after making acquisitions since they invest in non-profitable investment projects (Carolyn *et al.*, 2001).

Firms can decide to hold free cash flows for speculative purpose as they wait for a profitable investment that can promise better returns in future. The firm can also decide to invest in risk investments that have higher returns; these investments may later yield better returns which could be profitable to the firm. On the other hand, if poorly invested free cash flows can negatively impact on the profits of the firm if the firm engages in risk investments and end up losing (Griffith and Carroll, 2001).

Thus it is proved that there are a significant relationship between FCFs and firms' profitability. However, in some cases it is depends on the managers decisions. As managers and shareholders conflict of interest exist in most of the firms. Therefore, managers of many firms invest the free cash flows on negative NPV projects to remain their same or better interest but profitability reduces and ultimately the shareholders bear the negative effects. Hence it is important to investigate whether FCFs of a firm significantly contribute to the profitability of that firm or not. Therefore some studies conducted in this connection. For instance, Habib (2011) conducted a study surveying 7,229 companies listed on the Australian stock exchange between 1992 and 2005. He studied the current cash flow, stable profitability and growth opportunities on the stock returns, and to test hypotheses he used the multiple regression method. The results of the analysis show that firms with greater growth opportunities and free cash flow will have a higher value price, and additionally FCF is positively related to stock return while profitability is short-term. Wanja (2011) conducted a study on the relationship between the determinants of working capital management i.e. inventory, debtors, creditors, and the cash level of Kenyan SMEs. This research was conducted through a survey study. The target population of this study was the sampled 205 SMEs. Data was analyzed using a regression model and the results of the study found that firms with greater cash flow volatility hold more cash in order to provide a safe cushion for smooth operations.

Mong'o (2010) analyzed the impact of cash flow on profitability among commercial banks in Kenya over a period from 2005- 2009. It was specifically conducted to explain the influence that various components of cash flows have on profitability growth. The study was carried out by analyzing the various banks profit measured by the profit after tax the dependent variable and the cash flow components (operating, financing and investing) as the independent variables. A Multiple regression models were used to analyze the data and to provide a basis for the conclusions drawn. The findings for the study indicated that profits among commercial banks improved tremendously during the last five years. Cash flow from operating activities experienced the same trend which was occasioned by the improved performance which translated to financing and investing cash flow which have shown consistent increase over the five years. Cash flow from the financing and the investing activities were found to have a great influence (positive) of the banks profit while operating cash flow have a negative effect. In contrast, Opondo (2004), conducted a study on earnings and free cash flow to

evaluate corporate performance among commercial banks (43) in Kenya, a descriptive survey was conducted and data was analyzed using descriptive statistics, the results of the study revealed that there is no significant difference between free cash flow measure of corporate performance and that of earnings especially when the amount of maintenance capital spending cannot be properly segregated. Lastly, Ahmed and Javid (2009) conducted a descriptive survey on the effect of free cash flow on dividend payout of 320 non-financial firms listed in Karachi Stock Exchange in Pakistan, the study used a five years trend from 2001-2006 and data was analyzed using a multiple regression model, it was concluded that firms with larger free cash flow pay larger dividends.

The empirical evidence has shown that firms with free cash flow are able to invest in profitable projects. From the above studies, scholars have arrived at a conclusion that firms holding free cash flows are in a better position to take advantage of profitable projects that can promise higher returns in future. There are also some research works did not find positive influence of FCFs on the firms' profitability. Although, there are many research works have been done in this issue however none of the previous studies conducted on the Bangladeshi dataset. Consequently stimulated by conflicting results of previous studies and lack of research works in this connection using Bangladeshi dataset, this study is intended to investigate the relationship between FCFs and profitability of the DSE listed Bangladeshi firms. Based on the research objective this study attempts to test the following hypothesis.

H_0: There is no relationship between free cash flows and profitability of the DSE listed firms in Bangladesh.

H_1: There is a positive and significant relationship between free cash flows and profitability of the DSE listed firms in Bangladesh.

2. RESEARCH METHODOLOGY

The methodology of the study includes: research design, samples and sampling method, data collection and data analysis.

2.1 Research Design

In order to achieve the objectives stated in the preceding section, considering the nature of the study background and the research perspective this study has been adopted an empirical research design, which used a quantitative approach. This empirical study is appropriate for this research because the study is looking to provide an in-depth and clear scenario of the free cash flows and profitability of the DSE listed firms in Bangladesh.

2.2 Sampling, Sample and data collection

A purposive random sampling method is used to pick up sample firms from the DSE listed firms. Bank and other financial institutions sectors are avoided intentionally because their mode of operation is separate. Remaining all sectors is not also covered because firms are picked up randomly from alphabetic list. The study adopted 30 sample firms, 2 from Fuel and power industry, 3 from Tannery industry, 5 from Textile, 5 from Pharmaceuticals and chemical, 5 from Food and allied, 5 from Cement, and 5 from Ceramic industry. All the samples are selected purposively. Secondary data are used to conduct the study. Audited annual reports are analyzed to extract the required data for the study. Five years (2010-2014) data are used in the study. The statement of comprehensive income, the statement of financial position and the cash flow statement, these are used from the audited annual reports available from DSE.

2.3 Model Estimation

To achieve the objective of this study, the study used a multiple regression model to investigate the

relationship between free cash flow and the profitability. The regression model is as below.

$$P_Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e$$

Y= Profitability which was measured using return on capital employed. It was calculated using earnings before interest and tax divided by capital employed.

$\mathbf{X_1}$ = Capital Liquidity was measured using liquid assets that was divided by the total assets held by the listed firm.

$\mathbf{X_2}$= Represented the size of the firm which was measured using natural logarithm of total assets.

$\mathbf{X_3}$=Free cash flows was determined using operating cash flow minus capital expenditures.

B= Slope of the regression measuring the amount of the change in Y associated with a unit change in X

e =Error term within a confidence interval of 5%

This model considered the profitability as dependent variable. Free cash flows used as the main explanatory variable and capital liquidity, size of the firm used control variables. It is assumed that capital liquidity and size of the firm also contributes to the firm's profitability as well as performance. The Profitability is represented by the ratio of earnings before interest and tax to total assets, a variable that reflects the firms' ability to generate earnings from its assets. The variables that are used in an attempt to determine the firm's profitability include size, leverage, sales growth, investment and current assets (Stern, 2002). Total assets and turnover, are the variable utilized in the study Rajan and Zingales (1995), are commonly used as a substitute for size. Following Rajan and Zingales (1995), this study used total assets as size of the firms'. Larger firms not only enjoy a higher turnover and therefore are able to generate higher income, but also have better access to capital markets (Titman and Wessels, 1988) and lower cost of borrowing (Ross *et al.*, 2002). The amount of free cash flows available per year was used, Free Cash flow was measured using the following formula: Profit After Tax – [Changes in capital expenditure + Depreciations and Amortization –changes in working capital]. Profit after tax was obtained from the Income statement. Changes in Capital expenditure were obtained from Balance Sheets and Cash Flow Statements. Depreciation & Amortization was obtained from Prior & Current Balance Sheets: Current Assets and Liability accounts. Changes in Working Capital were obtained from the Balance Sheets and Cash Flow Statements. Capital liquidity measured as how much liquidity of firm used against the total assets. Capital Liquidity was measured using liquid assets that were divided by the total assets held by the listed firms. Capital liquidity was obtained from cash flow statement and balance sheet.

3. RESULT AND DISCUSSION

This part presents the analysis and findings of the study as per the research problem and methodology. The descriptive statistics of the dependent and explanatory variables are presented firstly then correlation and regression results are shown.

3.1 Descriptive Statistics

Descriptive statistics is the term given to the analysis of data that helps describe, show or summarize data in a meaningful way. The five years data of 30 sample firms are summarized in the table of descriptive statistics.

Table: 1 Descriptive Statistics

Variables	Minimum	Maximum	Mean	Standard Deviation
Profitability (Y)	-2.13	9.50	1.24	1.81
Free Cash Flow (X1)	-1.46	8.62	1.49	2.19
Capital Liquidity (X2)	1.29	9.95	1.32	2.07
Size of the Firm (X3)	1.40	2.34	2.38	3.63

Descriptive statistics of the variables consists with the minimum, maximum, mean and standard deviation. It is shown that there are big differences between the maximum and minimum values of the variables used in this study. The mean values also present a greater differences from the maximum values. Which indicates the size of the firms is far difference from big size to small size firm. The maximum score of profitability is 9.50 while the minimum score for profitability is -2.13. The mean and standard deviation for profitability of the listed firms' are 1.24 and 1.81 respectively. Free cash flow has maximum, minimum, mean and standard deviation is 8.62, -1.46, 1.49 and 2.19 respectively.

3.2 Correlation Analysis

Correlation is any of a broad class of statistical relationships involving dependence, though in common usage it most often refers to the extent to which two variables have a linear relationship with each other. In this study the relationship between the free cash flows and the profitability of firms listed in the Dhaka Stock Exchange is determined to establish the strength of the relationship between the variables. The findings are shown in table 2.

Table 2: Correlation between the Study Variables

	Variables	Profitability	Free Cash Flow	Capital Liquidity	Size of the Firm
Pearson Correlation	Profitability	1.000			
	Free Cash Flow	**0.**179***	1.000		
	Capital Liquidity	**0.**732**	**0.**103	1.000	
	Size of the Firm	**0.**723***	**0.**061	**0.**867	1.000

Note: *** indicates 1% level significance, ** indicates 5% level significance.

The Pearson correlation is +1 in the case of a perfect direct (increasing) linear relationship (correlation), −1 in the case of a perfect decreasing (inverse) linear relationship (anti correlation), and some value in the open interval (−1, 1) in all other cases, indicating the degree of linear dependence between the variables. As it approaches zero there is less of a relationship (closer to uncorrelated). The closer the coefficient is to either −1 or 1, the stronger the correlation between the variables.

From the above table 2, it is revealed that there is a positive relationship between the free cash flows and profitability of listed firms. As the correlation value (R= 0.179) is closer to zero (0) so the relation is weak but the correlation values for capital liquidity and size of the firm with regard to profitability are more close to 1, (R= 0.732 and 0.723) that indicate strong positive correlation between the variables. It is shown in the correlation matrix is that there are a positive and significant relationship between the dependent and explanatory variables. So taking into consideration the entire variable it can say that there exists strong correlation between dependent and independent variables. The Pearson correlation results suggested that the profitability of the sample firms is highly correlated with the free cash flows, size of the firm and capital liquidity.

3.3 Regression Analysis

A multiple regression was conducted in order to investigate the impact of free cash flows, capital liquidity and size of the firms on the profitability of the firms. The statistical package for social sciences (SPSS) is used to compute the measurements for the multiple regressions for the study. The findings are shown as below. The model summary is used to summarize the relationship between the free cash flows and profitability of the listed firms by determining the correlation and coefficient of determination of the regression model as provided below:

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Standard Error
1	0.762	0.580	0.571	1.192

One can draw conclusion regarding the relationship among variables through model summary with help of R and R squared values or with standard error of the estimates. Here the study explained R and R squared value to draw the bottom line regarding the relationship among the variables.

From the table 3 it is seen that the R square value is 0.580, which means that the regression model used for this study is a good predictor. The independent variables explained 58% of the variation in the profitability of the listed firms. The remaining 42% of variation in profitability of listed firms is not explained by the regression model. The model is fit because it explained more than 50% of the variation in the dependent variable. The correlation between the variables is explained by R = 0.762 which shows there is a strong positive correlation between the two variables.

Table 4: Test for Coefficients

Variables	B	Std. Error	t	Sig.
(Constant**)**				
Free Cash Flows	0.018	0.018	3.408	0.001
Capital Liquidity	0.096	0.096	2.138	0.034
Size of the Firm	0.035	0.035	3.707	0.000

Dependent Variable**:** Profitability

The study is conducted to determine the effect of free cash flows on profitability using the regression analysis. Therefore, the regression results of the study suggest generating the following regression equation:

$$\text{Profitability } (P_Y) = 3.313+0.018X_1+0.096\ X_2+\ 0.035X_3$$

With help of the above model, it is possible to determine the relationship between free cash flows and profitability (dependent variable) of the DSE listed firms. Remaining all other factors constant, an increase in one unit of the independent variables (free cash flows, capital liquidity and the size of the firm) results into a corresponding increase in one unit of profitability of the listed firms, this tells us that there prevails a direct positive relationship between free cash flows and profitability of the firms listed on Dhaka Stock Exchange.

Finally the test of the level of significance of the variables has found from the regression model. The study took 5% significance level which means that if the study becomes 95% confident about the significance of the decision and the study has only 5% chance to occur a type I error then the model is fit and the null hypothesis will be rejected. The decision criterion for reject a null hypothesis is that if the P-value is less than the level of significance so the study can reject null hypothesis and accept alternative hypothesis. The set null hypothesis of the study was that, “There is no positive and

significant relationship between free cash flows and profitability of the DSE listed firms in Bangladesh" and by rejecting the null hypothesis we became able to establish that there exists a positive relationship between the free cash flows and profitability.

The regression results in the table 4 shows that individually all the explanatory variables of the model are positive and significantly impacted on the profitability of the DSE listed firms in Bangladesh. For instance, there are a positive and significant relationship between the profitability and free cash flows of the DSE listed firms in Bangladesh. The relationship is statistically significant at 1% level. It indicates the DSE listed sample firms are used in this study are using their free cash flows for generating profits for the shareholders wealth maximization. It can be concluded that there are no agency problem exists between the managers and shareholders of the firms.

Further, the control variables namely capital liquidity and size of the firm also impacts on the firms profitability. It is also found that the relationship between capital liquidity and profitability is positive and significant at 5% level. Lastly the firm size also positively and significantly related to the profitability of firms at 1% level. It is suggested that the profitability of the DSE listed firms not only influenced by free cash flows but also influenced by capital liquidity and firm size.

These findings of this study are consistent with other studies. Such as, Hubbard (1998) shows that there is a significant positive relationship between free cash flows and profitability, an increase in the level of cash flow of a firm leads to a corresponding increase in profits of the firm. Further, Ahmed and Javid (2009) conducted a descriptive survey on the effect of free cash flow on dividend payout of 320 non-financial firms listed in Karachi Stock Exchange in Pakistan, the study used a five years trend from 2001-2006, it was found that firms with larger free cash flow pay larger dividends.

4. CONCLUSION AND POLICY IMPLICATION

The study intended to investigate the relationship between free cash flows and profitability of the DSE listed firms in Bangladesh. To do this, the study adopted an econometric model and applied on the 30 sample firms from 7 industries of Bangladesh. The study used EBIT as profitability variable and free cash flows, capital liquidity, and firm size as explanatory variables for investigate the intended objective. The study used five years (2010-2014) of average data set for the econometric model.

The study revealed the profitability and free cash flows of the firms are positively and significantly related. It is found that they are significant at 1% level and indicates their strong relationship. It is also found that capital liquidity and firm size have a positive and significant impact on the profitability of the firms. The result can be generalized that there are a positive and significant impact of free cash flows on the firms' profitability. It indicates the firms' managers are efficiently utilized their free cash flows for the shareholders wealth maximization which is the ultimate goal of a firm. In our country the managers are not willing to invest firms' free cash for their own interest rather they invest the money in profitable investments or pay out as dividend which indicates that the free cash flow eventually enhances the profitability of the firms. And the increased profitability of the listed firms increases the economy of our country.

The study recommends that listed firms should continue to invest in profitable ventures as found in this study in order to hold excess cash flows which are a measure of a company's ability to generate cash, which is a fundamental basis for stock pricing. This is why some people value free cash flow more than just about any other financial measure out there, including earnings per share. The study complements to managers of listed firms and recommends them to remain at their present position and also enhance their firms' value and discourages to become selfish in their interest that will bring

destruction at future.

The study already have situation where free cash flows are used in profitable sectors. But existing policies should be scrutinized and updated so that they can keep the present situation and based on this can strengthen the economy of our country. The government and capital market should take more strong and effective measures to enhance the environment for listed firms to ensure that free cash flow relies heavily on the state of a company's cash from operations, which in turn is heavily influenced by the company's net income.

Academicians and researchers will be benefited with the findings of this study for further research in this connection. The findings of this study will provide more insights to investors both foreign and local on the effect of free cash flow on investment while considering investment decisions and diversification of portfolios to increase profitability.

Limitations of the Study and Suggestions for Further Study

The limitation of this study is that it utilized secondary data, which might be historical. With companies competing in fast changing industries, an out-of-date research reports many have little or no relevance to the current market situation. Further, the study adopted a multiple regression model with four variables: three independent variables (free cash flows, capital liquidity and the size of the firm) and one dependent variable (profitability). Future researchers can adopt a similar model but investigate on other variables that may have a bearing on the profitability of listed firms at DSE. The study adopted was conducted in a period of five years between (2010-2014). These findings may not hold in the next five years as a result of macro-economic factors that might affect the profitability of the listed firms. The factors might involve political factors, change of government regulations and technology. This study was carried out within a limited time frame of five years and with only 30 samples out of 559 forms which constrained the scope and depth of the study. This required the adoption of a sample design hence these findings cannot be used to make generalizations on the effect of free cash flows on profitability of listed firms in the Dhaka Stock Exchange.

The limitation of the study suggested to further research in this connection for overcoming the existing limitation of this study. Future researchers may incorporate more variables, for example Returns on Assets and Return on Investments, Return on Equity to find out whether these results will hold. This will provide a better platform for making key recommendations on the importance of generating free cash flows by a firm.

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Conflict of interests

The authors declare no conflict of interest.