

Free Cash Flow and Firm Performance: Empirical evidence from the Amman Stock Exchange

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This study explores the effect of free cash flow on performance of companies in Amman Stock Exchange (ASE). The sample of the study included 100 firms of all sectors in the Jordanian market over six (6) years from 2010-2015. Several dimensions of cash flow were studied and three different measurements of performance were used (Return on Assets ROA, Market Value Per Share MVPS and Tobin's Q) to capture the different results from using each, and to assess the relevance of each measurement to performance and finally, to justify the conflicting results found by previous studies. Using panel data regression this empirical study showed that free cash flow affected only the return on assets and market value per share. Several recommendations are made for investors from the results obtained from the study and several points are clarified that need to be addressed by future studies.

Key words: Free cash flow, Firm performance, Amman stock exchange, Jordan.



Introduction

Corporate performance and factors affecting it are an important topic in finance as many researchers are concerned about firm performance and what makes one firm more successful than another. There are two different lines of research in the business research world. The first one is concerned with factors in the external economic atmosphere that affects firm success and the second one is concerned with the internal organizational characteristics. Both lines do not pay proper attention to the competitive position of the firm itself (Hansen and Wernerfelt, 1989).

Free cash flow as proposed by Jensen (1986), states that the firm can be paid to the investment unnecessary when there is a lot of free cash flow in our hands and projects negative NPV. Moreover, the hypothesis suggests that a higher level of free cash flows will lead to more administrative unnecessary waste and inefficiency. Free Cash Flow (FCF) is defined according to Lehn and Poulsen (1989) as net operating income before depreciation expenses, fewer tax expenses, interest expenses, and stock dividends, scaled by net sales. In the early 1990s, the relationship between free cash flow and performance was studied. Dechow & Ge (2006) stated that free cash flow is the cash flow from operational activities plus the cash flow from financial investments. Free cash flow comprises the resources available for the firm to invest but that otherwise can be distributed to the shareholders.

The study aims to explore the effect of cash flow on firm performance in Jordan using three different ways of measuring corporate performance and different dimensions of cash flow to determine exactly how these factors affect firm performance and how investors can benefit from this information to make the correct investment decision. This study may provide answers to many questions asked by interested individuals or institutes. The first question that may arise is does free cash flow really matter? If yes, how does this affect corporate performance? What are the other factors that may affect corporate performance? This study provides empirical evidence from Jordan on the effect of free cash flow on corporate performance using different measures of corporate performance and different types of cash flow to justify the conflicting results found by different researchers. It also investigates the patterns of cash flow in Jordanian market in addition to providing useful information to other interested parties that may benefit from it such as investors and researchers.

To outline the achievement of the study objectives, the remaining sections are organized as follows: Section Two, reviews the relevant literature and develops research hypotheses. Section Three develops a methodology through identifying a study sample, developing a study model, and measuring study variables. Section Four, details the descriptive study and the empirical study. The final section, presents study findings, recommendations and areas for future research, as well as study limitations.

Literature Review and Hypotheses

Free cash flow

Studies by Hwang et al., (2013); John et al., (2015), Labhane and Mahakud (2016), Byrd (2010), Wang (2010), Brush et al. (2000) found a negative relationship between free cash flow and performance. Analysis of the relationship between profitability and free cash flow to firms by Sadaf (2016) investigated the impact of free cash flow on the profitability of the firms, and Zhou et al. (2012), Mojtahedzadeh and Nahavandi (2011) investigated the relationship between agency problems that arise due to the free cash flow with long term profitability used for measuring long-term profitability. Tobin's Q. Sindhu (2014) examined the relationship between free cash flow and dividend in the presence of a moderator, firm size. Another study focused on free cash flows and the results were highly statistically significant across most companies and free cash flow and only two companies showed insignificant results (Holder et al., 1998; Hossain et al., 2001 and Adjaoud and Ben, 2010).

Bhundia (2012) and Jensen (1986) both determined that one of the greatest agency problems is the allocation of the free cash flow. According to Jensen (1986), the conflicts of interest between shareholders and managers over the dividend payout policy are especially severe when the organization generates large free cash flows. This is reflected in the problem of how to motivate managers to increase dividends instead of making investments with returns below the cost of capital or wasting cash through inefficiencies. Bhundia (2012) states that the operating cash flow disclosed indicates firm capacity to generate resources. He further comments that the operational cash flow should not be used only for the acquisition of new assets to allow the company to maintain its current level of activity; part of it should also be distributed as dividends. This situation of opposing uses generates an agency conflict between shareholders and managers. Kadioglu et.al, (2017) study was about free cash flow affects the performance of firms companies listed in Borsa Istanbul during the period 2009-2015 and the result was that a negative relationship is found between free cash flow and firm performance measured by Tobin's Q ratio. The result is also that leverage has a positive effect on performance. Sitthipongpanich, (2017) found that the presence of family owners reduces the sensitivity of investment and cash flow. Guizani Moncef, (2018) posed that large managerial shareholdings increased the level of free cash flow through lower dividend payouts and Tuan, (2018) that free cash flow and corporate profitability were evident in emerging economies.

Operating Cash Flow

The studies of Kirkham, R. (2012). Liquidity Analysis Using Cash Flow Ratios and Traditional Ratios and Galogah, et.al, (2013) have used the three cash flow components in their studies of free cash flow and profitability and Amah et.al, (2016). The relationship of cash flow and financial performance of listed banks in Nigeria, Ghanbari et.al, (2015) have used ROA, Velnampy and Kajanathan (2013) ROA and ROE, and Hydari et al (2014) have

used ROA, ROE, SR and Tobin's q as measures of financial performance. Studies have measured the effect of cash flow on financial performance Nwanyanwu 2015, Guda 2013, Mongo 2010. While Liman and Mohammed's (2018) study examines the impact of Operating Cash flow and Corporate financial performance in Nigeria for over 10 years (2005 to 2014). The result shows a positive and insignificant impact between Cash Flow from Operating Activities (CFO) and financial performance proxied by ROA while the impact is positive and significant when financial performance was proxied by ROE of the listed conglomerate companies in Nigeria.

The control variable Size and Financial Leverage have a positive and negative significant impact on ROA respectively but Amah et.al, (2016) on the Banking sector covers only four banks out of the eleven listed in the Nigerian stock exchange using Net profit as a proxy for performance for the period of nine years, and this study intends to extend the time frame to 10 years (2005 -2014) using 2 proxies for financial performance (ROA and ROE) with just one cash flow component (operating cash flow) and Ghanbari, et.al, (2015) investigated cash flow effect and financial performance ROA of companies listed on the Tehran Stock Exchange. Data from 183 companies were collected for the period 2009 – 2013. The researchers found that there is a meaningful relationship between accounting cash flow, equity cash flow, free cash flow, capital cash flow with the financial performance of listed companies in Tehran Stock Exchange (Bingilar, and Oyadenghan, 2014).

Based on the above literature findings, the current study suggests the following null hypotheses:

1st Hypothesis. There is no significant effect of free cash flow on firm performance.

2nd Hypothesis. There is no significant effect of operation cash flow on firm performance.

3rd Hypothesis. There is no significant effect of operating cash flow margin on firm performance.

Study Methodology

Study sample and resources of data

This study was conducted on the Amman Stock Exchange which is an emerging market because most previous studies were conducted in developed or other developing markets and fewer studies were conducted in the region. Firms were selected according to the following criteria: Data is available in the period of 6 years (2010 to 2015) and firms have not been closed or emerged with any other company during the study period. Data for 100 firms was obtained from Amman Stock exchange data base. The data is considered panel data which resembles time series (2010 to 2015) and cross-sectional data that resemble a group of companies. Panel data is considered as one of the best types of data because it contains two types of data.

Model Design and Definition of Variables

Panel regression analysis was employed to test the impact of cash flow on firm performance. The study model is presented as follows:

$$Perf_{i,t} = \beta_0 + \beta_1 FCF_{i,t} + \beta_2 OCFI_{i,t} + \beta_3 OCFM_{i,t} + \beta_4 Size_{i,t} + \beta_5 FinLev_{i,t} + \varepsilon_{i,t}$$

Where:

$Perf_{i,t}$: is a continuous variable; the dependent variable is the performance measured by four models (ROA model, MVPS model, and Tobin's Q model).

β_0 : is the constant.

β_{1-5} : is the slope of the independent and control variables.

$FCF_{i,t}$: The independent variable; free cash flow for the firm (i) in the year (t).

$OCFI_{i,t}$: The independent variable; operation cash flow for the firm (i) in the year (t).

$OCFM_{i,t}$: The independent variable; operating cash flow margin for the firm (i) in the year (t).

$Size_{i,t}$: The control variable; firm size for the firm (i) in the year (t).

$FinLev_{i,t}$: The control variable; financial leverage for the firm (i) in the year (t).

$\varepsilon_{i,t}$: random error.

The selection of variables is based on an examination of previous empirical studies (Galogah, et al. 2013; Ghanbari et al. 2015). Table 1 below shows the dependent variable, the independent variables and the control variables employed for all estimated models of the study.

Table 1: Variables Measurement

Variables	Label	Measurement
Dependent Variables:		
Return on Assets	ROA	Net income divided by total assets.
Market Value Per Share	MVPS	Calculated as the total market value of the business, divided by the total number of shares outstanding
Tobin's Q	T'Q	Market value of equity + Book value of short-term liabilities ÷ Book value of total assets
Independent Variables:		
Free Cash Flow	FCF	is defined by Jensen (1986) as the net cash flows of operating cash flows less capital expenditure, inventory cost, and dividend payment.
Operation Cash Flow	OCFI	was calculated as operation cash flow divided by the incomes.
Operating Cash Flow Margin	OCFM	Equal Net Operating Cash Flows divided by the Net Sales.
Control variables:		

Firm Size	Size	This variable was studied widely in previous studies and it was found that larger firms mostly has higher value and this may be explained to their experience and they may be more efficient due to economies of scales, the ability to employ skilled managers, ability to reach wider range of customers and diversify their operations. Size is measured by finding the natural logarithm of total assets.
Financial Leverage	FinLev	The firm's debt-to-assets ratio is the leverage ratio. It affects the firm's ability to borrow money and the cost of doing so which affects the firm's profitability and value due to the increase of interest rate and financial obligations of the company. Leverage ratio= total liabilities / total assets.

Descriptive Statistics

Table 2 below shows the descriptive analysis of the variables of this study. Where the average of the independent variable was reached, free cash flow (-1,201,664), and the standard deviation value reached (25,402,969), and the average of the OCFS is (0.063), and the standard deviation value reached (3.756), also the results of descriptive statistics show that the OCFI was (.0609), and the standard deviation value reached (0.105). Moreover, the ROA was (0.016), and the standard deviation value reached (0.096).

Table 2: Descriptive Statistics

Variables	Minimum	Maximum	Mean	Std. Deviation
Dependent Variables:				
Return on Assets	-0.520	0.380	0.016	0.096
Market Value Per Share	0.080	46.510	2.519	4.252
Tobin's Q	0.460	3.510	1.967	14.855
Independent Variables:				
Free Cash Flow	-243,630,034	437,966,934	-1,201,664	25,402,969
Operation Cash Flow	-0.370	0.500	0.061	0.105
Operating Cash Flow Margin	-36.350	73.700	0.063	3.756

Company performance was measured using ROA, MVPS and T'Q measurements. The Mean for T'Q was more than (1) which gives a positive indication about the value of companies listed in Amman Stock Exchange as this means that it achieved a market value that is higher than its book value. The lowest value of T'Q was (0.460). The highest value was (3.510). Regarding the second measurement (ROA), it had a mean of 1.6% during the study period and the standard deviation was very high which means there is huge difference between companies in achieving returns on their assets. Lowest (-52%) – highest (38%).

Regarding the third measurement (MVPS), it had a mean of 2.519% during the study period and the standard deviation was very high which means there is huge difference between companies in achieving MVPS. Lowest (8%) – highest (46.510%). All these results are found in Table 2 above.

Correlations Matrix and Regression Models

Table 3 below shows Pearson correlation between dependent and independent variables.

Table 3: Correlations matrix

	FCF	T'Q	ROA	MVPS	OCFM	OCFI
FCF	1.000					
T'Q	0.003 (0.944)	1.000				
ROA	0.008 (0.850)	-0.192*** (0.000)	1.000			
MVPS	-0.030 (0.473)	0.021 (0.617)	0.420*** (0.000)	1.000		
OCFM	0.009 (0.831)	0.009 (0.827)	0.088** (0.031)	0.031 (0.458)	1.000	
OCFI	0.253*** (0.000)	0.041 (0.318)	0.382*** (0.000)	0.298*** (0.000)	0.262*** (0.000)	1.000

Notes: Correlation (top), p-value (bottom). *, ** and *** denote significance at the 10%, 5% and 1% levels.

Table 4: Regression analysis

Variables	Tobin's Q Model		ROA Model		MVPS Model	
	β	<i>t</i> -statistic (<i>p</i> -value)	β	<i>t</i> -statistic (<i>p</i> -value)	β	<i>t</i> -statistic (<i>p</i> -value)
Constant	0.168	0.110 (0.912)	0.007	0.790 (0.430)	1.211	2.888*** (0.004)
Independent Variables:						
Free Cash Flow	-6.325	-0.253 (0.801)	-3.175	-2.192** (0.029)	-1.747	-2.585** (0.010)
Operation Cash Flow	10.010	1.553 (0.121)	0.314	8.423*** (0.000)	13.235	7.556*** (0.000)
Operating Cash Flow Margin	-0.055	-0.326 (0.745)	0.005	0.235 (0.814)	-0.056	-1.221 (0.223)
Control variables:						
Firm Size	-0.050	-0.714 (0.475)	0.001	2.640*** (0.009)	0.062	3.244*** (0.001)
Financial Leverage	5.777	2.603*** (0.009)	-0.082	-6.374*** (0.000)	-1.906	-2.588** (0.010)
R		0.114		0.453		0.351
R Square		0.013		0.205		0.124
Adjusted R Square		0.005		0.199		0.116
<i>F</i> -statistic		1.559		30.427***		16.352***
<i>p</i> -value (<i>F</i> -statistic)		0.170		0.000		0.000

Notes: OLS: *t*-statistic (top), *p*-value (bottom). *, ** and *** denote significance at the 10%, 5% and 1% levels.

From Table 3 it is seen that there was a relationship between some variables, and the highest correlation between independent variables value was (25.3%) where (FCF) and (OCFI), and the lowest correlation between independent variables value was (0.09%) which were between (FCF) and (OCFM), between dependent variables value was (42.0%) where (MVPS) and (ROA), and the lowest correlation between dependent variables value was (-19.2%) which were between (T.Q) and (ROA), also the results indicated that a significant relationship between some independent variables and dependent variable, the highest correlation between independent variables and dependent variable value has reached to (38.2%**) which was between (OCFI) and (ROA), and the lowest correlation between independent variables and dependent variable value were (-3.0%**) between (FCF) and (MVPS).

The data used in the study was validated using statistical tests to ensure that this data conforms to the conditions of applying General Linear Model and Ordinary Least Squares (OLS). The data is considered as panel data that combines time series (2010-2015) and cross-sectional data (100 firms). Panel Regression and the results of this test can be found in Table 4 below.

Study hypotheses may be tested as follow:

The t-statistic of Operating Cash Flow Margin was positive but not statistically significant at less than 5% using T'Q, ROA and MVPS models. That indicates that there is no impact of OCFM on company performance thus the third hypothesis regarding the presence of impact of Operating Cash Flow Margin on company performance is rejected.

Table 4 below indicates the effect of Free Cash Flow and Operation Cash Flow variables on company performance in Amman Stock Exchange using ROA and MVPS models and the t-statistic was positive which indicates the presence of a positive relation between free cash flow/operation cash flow and performance. Thus, the first and second hypotheses regarding the presence of impact of free cash flow/operation cash flow on company performance are accepted.

Conclusion

Evaluation of firm performance is an important issue in the management of the company, investors, and researchers. For managers, evaluation of firm performance is sometimes tied to their compensation to alleviate the agency problem. To investors, performance is an important indicator for relative success of their investment. The main objective of the study was to determine what really affect company performance. Three factors were chosen and are believed to be the most important factors that affect performance. These factors were free cash flow, operation cash flow and operating cash flow margin. Few studies have been conducted in the Middle East and very few or no studies have been conducted about this topic in the Arab world. In Jordan, this is the first time that this topic has been studied and this study is considered to be the first research to identify and bridge this gap.



It is beneficial to know what really affects company performance in this area and whether cash flow really affects performance. To conduct this study, the sample chosen was the whole Amman Stock Exchange which includes 100 listed companies in the financial market during a period of 6 years from 2010 to 2015.

Different validity tests were conducted on data and the models to validate them before testing them. The data and the models were found valid and any errors that were found were overcome using statistical tools. Three hypotheses were developed regarding the relation between each independent variable and company performance. The models were then tested and some descriptive statistics were defined and the following results were obtained:

- Operation cash flow was found to have positive effect and statistically significance on performance using ROA and MVPS indicators.
- Free cash flow was found to have a negative, statistically significant effect on performance using ROA and MVPS measurement.
- The Operating Cash Flow Margin has no statistically significant effect on performance.



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