

## *Free Cash Flow and Market Value Added of Firm: The Mediation Role of Cost of Capital.*

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### **Article information:**

Received: 27-06-2023

Revised: 11-07-2023

Accepted: 13-07-2023

Published: 25-08-2023

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### **Abstract:**

This study tests the effect of cost of capital on the relationship between free cash flow (FCF) and a firm's market value. The study selects twenty-six corporations that listed on the Amman Stock Exchange from 2010 to 2019. The FCF is an independent variable, cost of capital is a mediation variable (proxy of WACC), and market value added is a dependent variable. The study used the baron & Kenny methodology and Sobel-test to analyse the data of the four hypotheses, including the mediation effect for the cost of capital on the relationship between FFC & MVA. The results showed a positive and meaningful relationship between the free cash flow and the market value added of firm and the Sobel test results explain a partial mediation effect of the cost of capital. Therefore, FCF has the predicted power to send positive signals to the financial market participants about the firm's performance.

**Keywords:** Free Cash Flow (FCF), Weighted Average Cost of Capital (WACC), Market Value Added (MVA), Market Value of Equity (MVE), Capital Asset Pricing Model (CAPM), Beta Coefficient ( $\beta$ ).

## **Introduction**

Free cash flow has gained significant importance among investors and securities analysts because it is a vital indicator of enhancing survival and growth and empowering the company to pursue profitable investment projects. It gives firms the capacity to select worthwhile projects to increase stock value: beside discloses the company's ability to improve financial solvency, support their creditors' confidence, and provide shareholders' needs for cash distributions. FCF delivers a big picture of the company's performance to the supplier's capital (debt holders & equity holders), and the company meets all obligations, operating expenses, and working capital investment (Khatik & Patil, 2018, 111). Free cash flow directly relates to the firm's market value (Hassan & Hashemi, 2014). It has an inverse relationship with the cost of capital (Pareja, 2010) because the WACC represents a discounted rate and positively affects to increase of the firm value (Bukit et al., 2021). The market value added is also attractive among stockholders and stakeholders because it reflects owners' wealth and is the collective judgment of all participants in the financial market about the expected free cash flows (Ehrhardt & Brigham, 2011, 66). Besides that, the direct relationship between free cash flow and market value added makes the cost of capital the leading player in increasing and decreasing the firm's market value, and this topic was subject to deep discussions in corporate finance under the case of the effect of optimal financial leverage.

The remains sections will discuss the literature review and explore the relationship between all research variables. The final part will deliver an insightful analysis of the research hypotheses. They are finding discussion, conclusions, and recommendations.

## **Literature Review**

Michae Jensen (1986) is one of the pioneers who presented the theory of free cash flow and gave a definition for it. He defined free cash flow as cash from operating activities after reducing the cash necessary to invest in projects with a positive net present value. Free cash flow is operating profit

before depreciation cost after deducting the payments for taxes, interest fees, and dividends of preferred and common shareholders (Lehn and Poulsen 1989). Copeland (1994) stated that the (free cash flows of enterprises as operating profit after taxes plus non-cash expenses after deducting investment of working capital, properties, machinery, equipment, and other assets).

Based on the accounting accruals approach, the cash flows are cash generated from the company's operations activities, expressed as net income after tax addition to depreciation premium of fixed and other intangible assets (Higgins, 2001,18). Whereas according to cash accrual, the cash flow is the cash generated from operations (production, sale, and other services the company provides). The change in current and fixed assets play a vital role in generating these cash flows and financing activities (issuing stocks and bonds or repurchasing them) or paying due debts or dividends to shareholders (Gitman, 2012).

Beneda (2003) explains that the (FCF) is the money generated from the operations after covering all new investments, i.e., the remaining cash to each stockholder and bondholder. (Penman, 2004, 324) defined it as net cash generated from operations that determine the company's ability to pay shareholder claims and reduce debt. FCF is also the cash generated from operations and available for stockholders and bondholders after allocating the cash to profitable investments with a positive net present value which will contribute to the continuation and enhancement of the operational process (DeBoeuf, 2010) (Brigham & Ehrhardt, 2011, 59). It should be noted here that the investors view free cash flow as a tool for maximizing wealth and its connection with potential cash distributions to the stockholders by the company's management. Free cash flow is a measurement of cash generated from operations that can be distributed to shareholders or invested without affecting the company's future growth (Salim & Khasharma, 2007) (Chughtai et al., 2011). Accordingly, the managers of companies seek to make the company valuable by increasing the free cash flow in the future because an appropriate measure of financial performance and it provides good signals about the nature of the business and the quality of opportunities that contribute to creating a wealth of the company (Eiteman et al., 2007). Therefore, companies with positive free cash flows will increase their market value, and, at the same time, it generates pressure on the management to raise cash dividends to the stockholders (Vogt & Vu, 2000).

Besides the importance of free cash flow for the company and stakeholders, the cost of capital (WACC) is one of the essential concepts for corporate finance because it helps determine the company's strategy in adopting the appropriate financing mix (debt and equity financing) to guarantee the funding of investment opportunities with low cost (Galiniene & Butvilas, 2010). Therefore, the WACC is an appropriate discount rate for the expected cash flows from investment opportunities to determine the firm value (Ferraro, 2009); it represents the lowest rate required on the company's investment return to compensate all investors against the risks exposed (Brigham & Phillip, 2016) and in light of the optimal financing mix that maximizes the company's market value (DeBoeuf, 2010, 45-52) (Fernandez, 2011). Therefore, WACC and free cash flow are subject to the concept of the conflict of interest between managers and shareholders (agency theory) because the surplus cash may lead the manager toward the over-investment and may be used excess cash to finance investments with a negative net present value (Thanatawee, 2011). So, the low debt ratio and high Free cash flow could be good signs for shareholders to help them monitor and evaluate the company (Gregory & Wang, 2013). Besides mitigating the creditors' anxiety about paying their debts, free cash flow and cost of capital generate motivation to monitor the manager's behaviour to minimize the agency problem of the free cash flow (Khan et al., 2012).

#### **FCF, WACC, and the Market Value of firm**

The market value of firm is calculated by discounting free cash flow at the cost of capital (WACC). Accordingly, corporate managers seek to make the company valuable by increasing free cash flow to be an appropriate measure of financial performance in the future and by providing insight into the nature of business and the quality of cash flow-generating opportunities that will contribute to wealth generation. FCF may be a minus sign, it is not necessarily an unfavourable indicator for the company due to its results from an investment, which is typical in modern companies (Pouraghajan

et al., 2012); free cash flow should gradually shift to a positive outcome to improve the firm's market value added. Therefore, the rise or down in the firm's value depends on the size of the expected free cash flows, considering the cost of capital as the discount rate to determine the firm market value. Therefore, companies with high and positive free cash flows will generate two effects: the first motivates investors to pay more to get company stocks, and the second makes the stockholders pressure management to raise cash distributions.

In other words, the relationship between firm value and free cash flow is direct. The firm's value increases (or decreases) by increasing (or decreasing) the free cash flow (Ghodrati & Hashemi, 2014). The free cash flow does not just affect the company's market value, but the market value of the firm is also affected by the cost of Capital (Pareja, 2010) because an increase in free cash flows would reduce the company's need to borrow and issue new securities to obtain fund and will increase the debt capacity of the company, reduce the financial risks, and then minimize the cost of capital and maximize the market value. In addition, increased free cash flows will generate an impression among shareholders of the company's ability to reduce investment risks and contribute to improving the equity return. Thus, the company's investments become less risky from the investors' viewpoint when the free cash flows available to the stockholders increase, contributing to efficiently meeting its debt and other obligations and the firm's ability to sustain its ongoing operations.

### **Previous Studies**

The previous knowledge and research contributions focused on the impact of financial leverage on companies' financial performance and investment decisions. In comparison, other studies focused on the relationship of free cash flow with the cost of capital and the effect on a firm's market value. For example, Thanatawee's study (2011) stated that free cash flow is vital in determining the relationship between dividends policy and financial leverage during the company's life cycle. Bhundias's study (2012) confirmed that free cash flow indicates corporate agency problems. It motivates the management toward profits management because there is a positive statistically significant correlation between free cash flow and the firm's financial performance and a negative relationship with the debt ratio (Hong et al., 2012). Whereas the study of (Antwi et al. (2012) confirm the impact of capital structure on a firm's value, they suggested that corporate financial decision-makers must employ a mixed ratio of long-term debt and equity capital in financing their investments to increase the firm value. Iskandar et al. (2012) explain the moderating effect of the ownership Structure on the relationship between free cash flow and asset utilization": they concluded that the company with high free cash flow is subject to the increased control by owners to avoid opportunistic behaviours of the manager and mitigate the agency problem (Rahman & Saleh, 2008). Le Thi et al. (2013) and Rajhans et al. (2013) mentioned that the foreign ownership ratio and capital structure have a negative relationship with the firm's value, and there is an effect the cost of capital on the firm's value. Finally, Ghodrati & Hashemi (2014) concluded that the FCF had predicted power to determine the firm's market value.

Ater's study (2017) provided evidence of the relationship between capital structure and a firm's value. It indicated a statistically significant relationship between the capital structure and the importance of non-financial firms listed on the Nairobi Securities. Mai's study (2020) suggested that capital structure has the opposite effect on the firm value measured by (Tobin's Q). LUU study (2021) showed that the capital structure of firms in the chemical industry listed on the Vietnamese stock market has an inverse correlation with firm value. Bukit et al. (2021) tested the relationship between free cash flow, investment, and capital structure; they showed a positive effect on the solid value, and the capital structure does not play a vital role as a variable effect on the relationship between free cash flow, investment, and firm value. The study by Rizvi et al. in 2022 concluded that firm valuation provides a holistic overview of the business and helps identify the key strengths and stress points because the valuations concern free cash flow and the cost of equity. Fu et al. (2022) focus on the incremental value of FCFs in traditional price momentum trading: they find that FCFs contain complete and unpriced information that can bring the total value to pure momentum trading strategies.

## Statement of Problem

This research deals with and tries to avoid a common problem of financial statement preparation represented by the defects of the financial indicators suffered according to the accounting approach. They must accurately express the content of the accounting information disclosed; besides that, most of an accounting approach indicator is leading to an inflated evaluation and perhaps subject to profits management problem because of the flexibility preparation. Based on this problem, most companies use a modifying style of the contents of the financial statements to reflect a picture contrary to the reality of activities and events to influence the users' decisions when evaluating the company's market value. Moreover, the financial statements do not fully show the cost of invested Capital and free cash flow, making it difficult for the users of these lists to determine the financing mix and the weighted average cost of capital. Therefore, the study's purpose is to answer the following questions:

1. What is the importance of the company's free cash flows within its knowledge framework?
2. Is there an impact of the free cash flow on the firm's market value Added, and what is its direction?
3. Is there an impact of the mediation effect of WACC on the relationship between the free cash flows and the firm's market value Added?

## Study Model and Hypotheses

Figure (1) summarizes the conceptual framework of the relationship between the study variables. It is adapted based on the literature review of the study to formulate the following hypothesizes:

H<sub>1</sub>: The FCF has no statistically significant effect on the WACC (Path 1).

H<sub>2</sub>: There is no statistically significant effect of the WACC on the firm's market value (Path 2).

H<sub>3</sub>: The FCF has no statistically significant effect on the firm's market value (Path 3).

H<sub>4</sub>: There is no statistically significant effect of the cost of capital (mediating variable) on the relationship between FCF on the market value of firm.

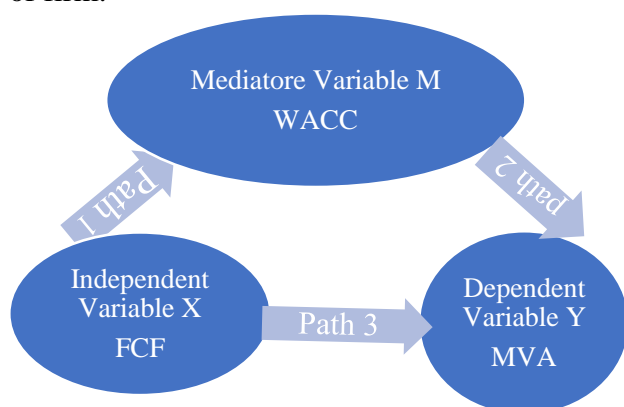


Figure 1 Study Model

## Statistical Methods (Roben Baron and David Keny's methodology)

1. The variances level of the independent variable significantly accounts for

variations in the presumed mediator (i.e., path 1).

2. The variations level of the mediator effect role significantly accounts for variations in the dependent variable (path 2)

3. If paths (1, 2) are controlled, a previous relation between the independent and dependent variables is no longer significant. The most important demonstration of mediation occurs when path 3 is zero. Noted that condition (3) requires a significance test for direct path 3, the paths 1, 2, and 3 are tested and estimated by the following three equations (Zhao et al., 2010, 198):

$$M = i1 + 1 X + e1 \quad (1)$$

$$Y = i2 + c' X + e1 \quad (2)$$

$$Y = i3 + 3 X + 2 M + e1 \quad (3)$$

Baron and Kenny recommended examine the indirect path (1 \* 2) by the Sobel test to test the statistical significance of the difference between the total and direct effects. This test requires estimating a standard error of the mediation path (1,2) (Hayes, 2009, 411). In other words, it interprets whether the reduction in the effect of the independent variable, including the mediator in the model, is significant and whether the mediation effect is statistically significant.

The current methodology is recommended testing the indirect paths (2 & 3) by the Sobel test to examine the statistical significance of the difference between the total and direct effects. This test requires estimating

a standard error of the mediation path (2& 3). Therefore, the Sobel test examines whether the inclusion of a mediator variable (M) in the regression analysis considerably reduces the effect of the independent variable (X) on the dependent variable (Y) (Abu-Bader & Jones, 2021, 47), Sobel test statistic calculates as follows (YaY, 2017, 128): -

$$z = \frac{ab}{\sqrt{(b^2SE_a^2) + (a^2SE_b^2)}}$$

a = regression coefficient for the relationship between the independent variable and the mediator variable (path 1),

b = regression coefficient for the relationship between the mediator and the dependent variable (path 2),

SE<sub>a</sub> = standard error of the relationship between the independent variable and the mediator variable (path 1).

SE<sub>b</sub> = standard error of the relationship between the mediator and dependent variables (path 2).

If the z-score exceeds 1.96, the effect is more prominent than expected by chance and calls the impact significant. The standard error can obtain confidence intervals around the mediated effect.

## Research Objectives

The research tries to delivered an alternative indicator to avoid a common problem of accounting number that preparation based on the accounting approach. Therefore, the research focuses on achieving the following objectives: -

- 1) The study explores the mediation role of cost of capital on the relationship between free cash flows and the market value of company based on cognitive propositions.
- 2) The study determines the impact of each the free cash flow and cost of capital on the market value, collectively and individually.

## Research population and sample, and Data Collection

When researchers reviewed the financial statements of the listed industrial companies on the Iraq Stock Exchange, they found

measuring the current study indicators difficult. Because most listed companies on the Iraqi stock exchange mainly depend on equity financing compared with borrowed funding and focus on short-term debt. This problem represents a critical limitation of the study; researchers did not have access to all data regarding the study variables because of financial, economic, and environmental constraints. Therefore, the Amman Stock Exchange (ase) was an alternative community to implement the study rather than Iraqi stock exchange for some considerations, the legal articles and regulations governing the Amman Stock Exchange and corporations are almost compatible with the Iraqi stock exchange. Moreover, both work under the terms and conditions of the Arabian Burses Union. The research population consists of all the industrial companies listed on the Amman stock exchange, numbering (93); according to the statistics announced for 2022. The study focused on (26) industrial firms, constituting 28% of the research population, because it has all data needed to calculate the research variables. The study data was extracted from the companies' sample's annual financial reports and the reports issued by the Amman stock exchange. In addition, review of books, periodicals, academic theses, and articles to support a study's theoretical bases and knowledge aspects. Notable, the period (2020-2022) was excluded because of unavailable valid data regarding the study sample due to the pandemic conditions (COVID-19).

## Operational definitions of study variables

1- Free Cash Flow (FCF) (Independent Variable)

the excess cash flow from operating profit after tax plus the annual depreciation premium minus net new investments, as follows (Brigham & Ehrhardt, 2011, 62- 64): -  
 FCF = (NOPAT+D) – NIOC..... (1)

Wherein (NOPAT) net profit after tax + depreciation premium (D), and (NIOC) net investment in the capital (net working capital + investment in assets available).

2- Cost of Capital (WACC, Mediator Variable)

For the study purpose, the WACC was calculated based on financing sources as follows (Brigham & Ehrhardt, 2011, 337 ( )Gitman & Zutter, 2012, 35): -

$$WACC = I_d (1 - t)D\% + K_e E\% \quad \dots (2)$$

$I_d (1-t)$  is the after-tax cost of debt,  $D\%$  is debt ratio,  $E\%$  is equity ratio, ( $K_e$ ) is the cost of equity calculated based on the capital asset pricing model, as follows:

$$K_e = R_f + \beta_e \times MPr \quad \dots (3)$$

Wherein ( $R_f$ ) is a risk-free return (calculated based on the average interest rate on certificates of deposit for three months and each year of study). The ( $\beta_e$ ) is beta coefficient to measure systemic risk and ( $MPr$ ) is market premium ( $R_m - R_f$ ). Beta coefficient was calculated based on the monthly returns of the company's shares and the monthly market return, as follows (Reilly & Brown, 2006, 240-246): -

$$\beta_i = r_{im} \sigma_{ri} / \sigma_{rm} \quad \dots (4)$$

Wherein  $r_{im}$  is the correlation coefficient of stock return and market return,  $\sigma_{ri}$  is the standard deviation of stock return, and  $\sigma_{rm}$  is the standard deviation of the market return.

## 2- Firm's Market Value (Dependent Variable)

The study used the market value added (MVA) as a proxy indicator for a firm's market value and calculated it as follows (Raman, 2005): -

$$MVA = MEV - BVE \dots (5)$$

MEV is the number of common stocks multiplied by the market price, and BVE is the book value of equity as disclosed on the firm's balance sheet.

## Statistical Description of Research Variables

Table (1) presents the arithmetic mean and standard deviation for research variables, and the results of the normal distribution test according to the (Kolmogorov-Simirnov) test. The results of which showed that the data is normally distributed because the P-value is greater than 5%. The average free cash flows for the sample of companies under analysis during the research period were (1497480 JD), with a standard deviation of 9491186 JD). The average cost of capital for the sample of companies was 8.93%, with a standard deviation of 5.1%. While the average market value added was (8525800 JD) and a standard deviation of (17805250 JD), and it is clear from the average market value added that the industrial companies contributing to the research sample have achieved an average annual positive added market value during the period, which indicates the market share prices of the study sample companies witnessed a significant increase during the research period, to indicate the increase in the market value of the companies over their book value

Table 1 Statistical Description of Research Variables\*

Variables	Mean	S.D.	K- Simirnov	Probability
WACC %	8.93	5.1	7.1	.117
FCF (JD)	1497480	9491186	12. 1	0.082
MVA (JD)	8525800	17805250	14.67	0.099

## Analysis of the three paths' Results

### Person Correlation coefficients Analysis

Table 2 displays the correlation coefficients between the mediator, independent, and dependent variables. It shows that all correlations are significant at level 1%. There is a positive correlation between free cash flow and market value added, and both have a negative correlation with the weighted average cost of capital; this is a logical relationship because a lower WACC and an increase in the free cash flow will maximize the MVA of the firm. Furthermore, their correlation values did

not exceed the permissible percentage (80%) according to the assumptions adopted in the field of statistics; this result confirms the validity of the absence of multiple linear correlations between the independent variables.

Table 2 Person correlation coefficients Results\*

Variables	WACC	FCF	MVA
WACC	1	-0.670**	-0.654**
FCF	-0.670**	1	0.623**
MVA	-0.654**	0.623**	1

\* Correlation is significant at the 0.01 level (2-tailed)

First hypothesis Testing Results (path 1)

Table 3 shows that the F-test results confirm rejecting the null hypothesis ( $H_1$ ). It means the FCF has a statistically significant effect on the cost of capital with a p-value lesser than 5%. The model is fit and possesses explanatory power for FCF (0.465). This result indicates

that the mean values of FCF can explain 46.5% of the variation in the WACC.

Also, the table presents the Autocorrelation test and simple regression results. The Durbin-Watson value (2.1) shows no autocorrelation among the regression equation's errors within acceptable limits of 0-4.

Table 3 Results of the first hypothesis of path (1)				
(WACC) = Dependent Variable				
Independent Variable	Beta Coefficient	Standard Error	t-test	Sig.
FCF	-.386	.031	12.43	0.00
r	R <sup>2</sup>	D.W.	F. Calculated	Sig.
-.68	.47	2.1	15.6	0.00

Second hypothesis testing results (path 2)

Table 4 shows the negative relationship between WCC and MVA. The f-test results confirm rejecting the null hypothesis ( $H_2$ ), and the cost of capital has a statistically significant effect on the firm's market value with a p-value lesser than 5%. The model is fit and possesses explanatory power for WACC (.375) and

indicates that the cost of the capital can interpret 37.5% of the variation in the firm's market value (MVA).

Also, the table presents the Autocorrelation test and simple regression results. The Durbin-Watson value (1.9) shows no autocorrelation among the regression equation's errors within acceptable limits of 0-4.

Table 4 Results of the second hypothesis (Path 2)				
(MVA) = Dependent Variable				
Independent Variable	Beta Coefficient	Standard Error	t-test	Sig.
WACC	-.512	0.034	14.9	0.00
r	R <sup>2</sup>	D.W.	F. Calculated	Sig.
-.61	.375	1.9	22.4	0.00

Third hypothesis testing Results (Path 3)

Table 5 shows the positive relationship between free cash flow and MVA. The f-test results confirm rejecting the null hypothesis ( $H_3$ ), and the FCF has a statistically significant effect on the firm's market value with a p-value lesser than 5%. The model is fit and possesses explanatory power for FCF (.458) and

indicates that the FCF can interpret 45.8% of the variation in the firm's market value (MVA). Also, the table presents the Autocorrelation test and simple regression results. The Durbin-Watson value (2.4) shows no autocorrelation among the regression equation's errors within acceptable limits of 0-4.

Table 5 Results OF the third hypothesis (Path 3)				
(MVA) = Dependent Variable				
Independent Variable	Beta Coefficient	Standard Error	t-test	Sig.
FCF	.569	.030	14.78	0.00
r	R <sup>2</sup>	D.W.	F. Calculated	Sig.
.68	.458	2.24	21.8	0.00

Fourth hypothesis Testing Results (Mediation Effect)

The hypothesis results of paths (1, 2) confirm

the study methodology's first and second conditions, as shown in the table (3, 4, 5). Table 6 displays the result of multiple regression of

the fourth hypothesis; the three states were explained to reject the fourth null hypothesis and accept the alternative. Based on the Sobel test, the mediator variable has a statistically significant effect at level 5% because the z

value is (9.596) and more powerful than 1.96. However, with a partial result, because the Beta coefficient of the mediator variable (WACC) reduces from (-0.512 path 2) to (-0.197), it is close to zero.

Table 6 Results of Mediation role of cost of capital

	Beta Coefficient		Standard Error	
	Path 1	Path 2	Path 1	Path 2
Inputs	-.386	-.512	.031	.034
Beta Coefficient of Path 2	-.197			
Sobel Test	9.5961			
One-tailed probability: 0.00	Two-tailed probability: 0.00			
*Calculated by Analytics Calculator (Online)				

## Findings Discussion

The Pearson correlation matrix results revealed a direct and positive relationship between free cash flows and the firm's market value and are inversely related to the cost of capital. It is a logical result and consistent with the cognitive awareness of corporate finance literature. The analysis explains that the free cash flow significantly interests participations and analysts in the stock market because it is critical in improving the optimistic predictions about the firm future. Besides that, the free cash flow has a vital role in governing the combined effect of investment decisions and financial leverage on the firm's market value during the firm's life cycle. Furthermore, free cash flow could be an indicator for monitoring and controlling shareholders (Gregory & Wang, 2013) to mitigate the agency problem within the corporation because the manager faces more difficulty hiding financial misbehavior and management adjustments in the cash flow statement. These findings confirm the results of (Rahman & Saleh, 2008) and Iskandar et al. (2012) studies.

## Conclusion Remarks

1. The cost of capital partially affects the relationship between free cash flow and the company's market value. Therefore, the free cash flow plays a critical role in estimating the rise and down of the firm value.

2. The results agreed with the findings of most of the previous studies on the importance of these indicators in their relationship with the company's added market value, describing this value as the cumulative measure of return-on-investment Capital and an indicator of a successful in evaluating the firm performance according to the securities market participants' viewpoint.

## Recommendations

1. This study recommends that participants in the securities market, in general, and in the Amman stock exchange and Iraqi securities market in specific, adopt the FCF index because it is more significant to evaluate the firm's capabilities to pursue profitable opportunities.
2. The free cash flow is a better indicator for evaluating the company's financial flexibility and ability to finance the new profitable investment.
3. Enhancing the elements of free cash flows in the financial statements of firms as part of voluntary reporting to enable the investors and financial analysts toward a healthy evaluation share of the company,

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