

THE GOVERNANCE INVOLVEMENT IN THE RELATIONSHIP BETWEEN EARNINGS MANAGEMENT AND SURPLUS FREE CASH FLOW

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Abstract

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The purpose of this study is to examine empirically the association between surplus free cash flow (SFCF) and earnings management (EM), and the moderating effect of governance on this relationship. The study used a sample of non-financial companies listed on the Amman Stock Exchange (ASE) over the ten-year period (2011–2020) with all the information necessary to estimate the study variables. The modified Jones (1991) model is used to estimate discretionary accruals, a widely used proxy for earnings management. Based on the regression analysis of the related panel data collected, the study's findings indicate that SFCF is positively associated with EM activities. This result is consistent with most prior related study's findings (Nouri & Gilaninia, 2017; Rahmawati, 2020) and suggests that when growth opportunities are limited, the free cash flow induces management to involve in upward management practices. Additionally, results indicate a significant negative impact of the interaction variable $SFCF * AQ$ (audit quality) on EM, suggesting that, in an SFCF situation, AQ reduces manager's tendency to involve in upward EM practices. The study's results are likely to be useful for accounting researchers, local governmental bodies, and policymakers who are concern with the impact of EM practices on the quality of earnings.

Keywords: Surplus Free Cash Flow, Earnings Management, Corporate Governance, Audit Quality, Chief Executive Officer Duality, Amman Stock Exchange

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1. INTRODUCTION

Free cash flow (FCF) is a company's cash generated after accounting for capital expenditures (Mills et al., 2002). Surplus FCF (SFCF) is when a company

generates more than it needs to maintain its current operations and fund its growth (Toumeh et al., 2020). This excess cash can be used for dividend payments, share buybacks, or acquisitions. Earnings management (EM) refers to a company's actions to

influence the reported financial results to meet or exceed analysts' expectations or comply with accounting regulations (Dechow & Skinner, 2000). This can include activities such as deferring revenue recognition or accelerating expense recognition. This study aims to investigate the link between SFCF and EM in Jordanian companies listed on the Amman Stock Exchange (ASE) and the impact of corporate governance on this relationship. Investors and creditors need to understand how EM, which can be defined as the manipulation of financial reports by managers, affects a company's financial performance. Scholars have proposed various definitions for EM, including using discretion in financial reporting to achieve short-term goals. The link between SFCF and EM was widely researched, focusing on the agency theory and the potential conflict of interest between shareholders and management. However, few works have examined this issue in the Jordanian firm context which highlights the importance of this study. This study aims to provide empirical evidence on the impact of SFCF on EM and the role of corporate governance in this relationship.

This study focuses on two major research questions:

RQ1: Does SFCF affect manager tendency to involve in upward EM practices as it has been suggested by the agency theory?

RQ2: Do the corporate governance variables such as audit quality (AQ), CEO duality, and audit committee (AC) moderate the impact of SFCF on EM practices?

The review of prior related studies in this research stream discloses two notable observations. First, the empirical findings on these issues are mixed and inconclusive. Secondly, not many studies have examined these issues in emerging markets. This study extends and contributes to the current literature by obtaining empirical evidence on these issues from a small emerging market with a different institutional, economic, and legal environment from that of developed countries in which most prior related studies were carried out. To the best of the researchers' knowledge, this study is the first to examine the moderating impact of corporate governance on the SFCF-EM relationship in the Jordanian economic environment. The study used Jones (1991) model of earning management and the results are matched with an existing body of the literature (Nouri & Gilaninia, 2017; Rahmawati, 2020) which suggest using free cash flow for upward management practices when there are limited chances for growth.

The theoretical contribution of this research is in generating a better understanding of the theoretical relationship between SFCF and EM which will be reflected in practical implications such as enhancing the governmental bodies' awareness of companies EM actions and enhancing academics understanding of EM.

The rest of the paper is organized as follows. Section 2 reviews the related literature and develops hypotheses. Section 3 describes the research methodology that has been used to carry out the empirical tests. Section 4 presents the empirical results and the discussion of these results. The research conclusions, limitations, and proposed future research are parented in Section 5.

2. LITERATURE REVIEW

FCF can be used for various purposes, such as paying debts (Fleming et al., 2005; Griffin et al., 2010) or dividends (DeAngelo et al., 2004) that become payable following the announcement date. However, managers may not always pay dividends even when a significant amount of FCF is available because they may choose to invest it in unproductive projects (Abor & Bokpin, 2010) or unsuitable for the owners (Cardoso et al., 2014). On the other hand, using FCF to acquire shares of multinational corporations can increase control by foreign agencies and shareholders, which can help ensure that managers' actions align with the owners' interests (Cheng et al., 2014; Jian et al., 2011) and increase the chances of using FCF for productive investment opportunities (Richardson, 2006). FCF can also buy back a company's shares (Kapavicius & Yu, 2012). They are analysing FCF and its impact on various variables, an essential area of study (Rezaei & Jafari, 2015). Furthermore, predicting FCF can aid in making more favourable investment decisions.

A company may distribute a portion of its profits to shareholders through cash or share dividends (Khalaf, 2022; Bilel & Moudher, 2020). Shareholders typically show interest when a company declares dividends (Aburishah et al., 2022). However, when deciding to distribute dividends, a company must consider its available retained earnings and cash. If a company decides to distribute dividends from additional capital, such rewards are liquidation dividends (Weygandt et al., 2012).

As mentioned above, this research investigates the link between SFCF, EM, and company governance. EM refers to accounting policies used by managers to increase or decrease reported earnings to meet their objectives and is often motivated by factors such as management compensation plans (Ewert & Wagenhofer, 2005; Healy & Wahlen, 1999; Flayyih & Khiari, 2022). Therefore, the company is able to distinguish between profit and money numbers disclosed to the public (Rahman et al., 2023). Discretionary accruals, determined by a manager's discretion and not specified in contracts, are often used as a proxy for EM in research (Sun & Rath, 2010). The importance of governance, or internal controls and oversight, has also grown concerning EM. This research will focus on discretionary accruals as a proxy for EM and the moderating impact of governance on the association between SFCF and EM.

Moreover, this section presents findings from previous investigations on the relationship between SFCF and EM, and the moderating role of governance in different countries. The studies cited have used various measures and data sets, but overall, they have shown a positive association between SFCF and EM (Banimahd & Aliabadi, 2013; Bukit & Iskandar, 2009; Jones & Sharma, 2001; Kothari et al., 2005). They also show that governance, such as the presence of independent audit committees (Hidayat et al., 2022; Machdar, 2022), can have a moderating effect on this relationship. Additionally, some studies have highlighted that other factors, such as company size (Bukit & Iskandar, 2009), financial leverage (Choi et al., 2011), and growth opportunities (Jones & Sharma, 2001), can also impact this relationship.

In contrast, several investigations have evaluated this relationship according to chronological order. Indeed, in 2011, a Tunisian team (Ben Moussa & Chichti, 2012) examined how the ownership structure and debt policy can effectively resolve conflicts between shareholders and managers caused by overinvestment and the issue of free cash flow. It employed a three-stage least square simultaneous model and used data from 35 Tunisian non-financial listed companies from 1999 to 2008 as its sample. The results supported the theory proposed by Jensen (Jensen, 1986) that debt policy is the primary tool for managing free cash flow risk. However, the findings of this study also suggested that high levels of ownership concentration and managerial ownership may increase free cash flow risk.

Moreover, the examination of the FCF hypothesis proposed by Jensen (1986) was also carried out in a Jordanian study (Zurigat et al., 2014). In the same year, this study examined data from 102 non-financial firms listed on the ASE from 1998 to 2009, using both panel data and pooled methods. They found that debt and dividends are not mutually exclusive ways of addressing agency costs related to FCF in the Jordanian capital market, but instead they work together. However, debt is used more than dividends for stability purposes, and the use of debt and dividends is influenced by factors such as dividend smoothing and adjustments to leverage targets. Additionally, they found that firms with lower growth tend to use debt more than dividends. A year later, Cheng et al. (2014) studied the relationship between FCF and both growth opportunities and dividend payout in Chinese companies. They analyzed financial statements from 1105 firms from 2003–2011 and discovered that FCF has a positive and statistically significant effect on dividend payout. Later, Tijjani and Sani (2016) examined the relationship between dividend policy and FCF in Nigerian oil and gas companies. The research used annual report data from 2003 to 2014 and employed several statistical methods, including multiple regression, correlation analysis, and descriptive statistics. Results indicated that FCF and earnings per share (EPS) positively impact dividend policy, while leverage has a detrimental impact. Additionally, the study found that companies with a high proportion of shares held by managers tend to pay lower dividends. The study recommended that firms in the gas and oil industry should focus on increasing FCF and profitability while reducing leverage to increase dividends.

On the other hand, Susanto et al. (2017) investigated the influence of audit quality, board of commissioners, and board independence on the association between SFCF and EM. Data from 290 manufacturing firms listed on the Indonesia Stock Exchange (ISE) for the period 2012–2014 was collected using a purposive sampling technique, and analyzed by multiple regression analysis. Therefore, the presence of a board of commissioners, independence of the board, and high audit quality has a negative and significant effect on the relationship between SFCF and EM. This suggests that a delegation of commissioners, an independent commission, and increased audit quality can mitigate the issue of EM resulting from SFCF. They can also oversee the opportunistic behaviour of managers that may arise from FCF.

For Jordanian industrial joint stock companies, Al Hayek (2018) assessed the correlation between revenue and net profit with net cash flow from operating activities. This was accomplished through the descriptive analytical method, using statistical techniques to examine the study data, represented by the actual data drawn from the companies concerned for the period (2010–2017). Results showed the validity of the hypothesis:

H₀: There is a statistically significant relationship between revenue and net profit with net cash flow from operating activities in joint-stock companies' Jordanian industries.

In the same context, another study identified the relationship between SFCF, audit quality, ownership, and EM in Jordanian-listed companies from 2003–2016 (Al-Omush et al., 2018). It found that financial distress significantly impacts earnings management. The research employed the cash flow statement, which gives insight into an organization's cash inflows and outflows, to measure overall well-being and financial performance. Additionally, the research investigated the occurrence of accrual and base EM and found that corporate governance constraints impact the relationship between EM and high FCFs firms.

These studies suggest that managers with low growth opportunities and high SFCF tend to use discretion to manage earnings and that governance and other factors can influence this relationship.

The primary concern of most investors is believed to be cash flow. In this context, governance is seen as a means of controlling EM in non-financial companies listed on the ASE, hence the interest in testing the following hypotheses:

H1: SFCF has a positive impact on EM activities.

H2: CEO duality moderates the impact of SFCF on earnings management activities.

H3: The audit committee moderates the impact of SFCF on earnings management activities.

H4: Audit quality moderates the impact of SFCF on EM activities.

3. METHODOLOGY

3.1. Study population and sample

The study sample consists of all non-financial companies listed on the ASE for the ten years (2011–2020), for which all the necessary information to measure the study's variables is available. To be part of the sample, the firm must meet specific criteria, such as: 1) listing all companies in the ASE during the study period (2011–2020) and 2) the accessibility of companies' financial information. In line with most previous related studies, financial companies are eliminated due to their different reporting structure and the fact that they are subject to various regulations. The data needed to measure the study variables is obtained from the sample companies' annual reports and the ASE website¹.

3.2. The general test and model

The regression model presented below will be used to examine the studies hypotheses:

¹ <https://www.ase.com.jo/en>

$$DAC_{it} = \beta_0 + \beta_1 SFCF_{it} + \beta_2 LEV_{it} + \beta_3 AQ_{it} + \beta_4 AC_{it} + \beta_5 CEO_{it} + (\beta_2 SFCF_{it} * AQ_{it}) + (\beta_3 SFCF_{it} * AC_{it}) + (\beta_4 SFCF_{it} * CEO_{it}) + \varepsilon_{it} \quad (1)$$

where,

- DAC_{it} is the discretionary accruals for the firm (i) and period (t). Discretionary accruals are used as a measure of earning management;

- $SFCF_{it}$ is the surplus free cash flow for the firm (i) and period (t);

- CEO_{it} is the CEO duality for the firm (i) and period (t);

- AC_{it} is the audit committee for firm (i) and period (t);

- AQ_{it} is the audit quality. Auditors in the Big 4 (Deloitte, Ernst & Young [EY], KPMG, and PricewaterhouseCoopers [PwC]) are considered higher quality for the firm (i) and period (t);

- LEV_{it} is the financial leverage measured by the ratio of total liabilities to total assets for the firm (i) and period (t);

- $SFCF_{it} * CEO_{it}$ is the interaction variable of $SFCF$ with CEO duality of the firm (i) and period (t);

- $SFCF_{it} * AC_{it}$ is the interaction variable of $SFCF$ with the firm's *audit committee* (i) and period (t);

- $SFCF_{it} * AQ_{it}$ is the interaction variable of $SFCF$ with the firm's *audit quality* (i) and period (t).

3.3. Measurement of variables

3.3.1. Dependent variable: Earnings management (discretionary accruals)

Following prior earnings managing studies, earnings management is measured by the level of discretionary accruals. To estimate discretionary accruals through the modified Jones (1991) model, the most relevant model in EM detection (Jones, 1991). To estimate discretionary accruals, the following model was first executed:

$$TAC_t / TA_{t-1} = \beta_1 (1/TA_{t-1}) + \beta_2 (\Delta REV_t - \Delta REC_t / TA_{t-1}) + \beta_3 (PPE_t / TA_{t-1}) + (\varepsilon_{it}) \quad (2)$$

where,

- TAC_t are total accruals in year (t) divided by total assets in year ($t - 1$);

- TA_{t-1} are total assets in year (t);

- ΔREV_t are revenues in year (t) less revenues in year ($t - 1$);

- ΔREC_t is receivable in year (t) less receivable in year ($t - 1$);

- PPE_t is gross property plant and equipment in year (t).

To measure total accruals, in the literature two methods for calculating total accruals are used balance sheet approach and cash flow approach. Hribar and Collins (2002) argued that using balance sheet approach to compute total accruals is inferior in certain circumstances to a cash-flows-statement based approach; this study adopted the cash flow approach using the following formula:

$$TAC_{it} = NI_{it} - CFO_{it} \quad (3)$$

where,

- TAC_{it} are total accruals for the firm (i) and year (t);

- NI_{it} is net income for the firm (i) and year (t);

- CFO_{it} is cash flow from operation for the firm (i) and year (t).

The TAC is suggested to be the sum of both discretionary and non-discretionary components. It is composed of non-discretionary accruals that arise from the normal operations of the business and discretionary accruals that result from choices made by the management of the company:

$$DAC_{it} = TAC_{it} - NDAC_{it} \quad (4)$$

The following equation will be used to compute the NDAC:

$$NDAC_t / TA_{t-1} = \beta_1 (1/TA_{t-1}) + \beta_2 (\Delta REV_t - \Delta REC_t / TA_{t-1}) + \beta_3 (PPE_t / TA_{t-1}) + (\varepsilon_{it}) \quad (5)$$

where,

- NDAC is the non-discretionary accruals for the firm (i) and period (t).

- $\beta_1, \beta_2, \beta_3$ are estimated coefficients obtained from the regression model 2, all other variables are defined above.

3.3.2. Measuring independent variable SFCF

To evaluate this variable, we calculate the degree of FCF by combining the retained *cash flow* (CF) with the reciprocal of Tobin's Q. The greater the retained CF and the smaller Tobin's Q, the higher the FCF risk. To determine the retained CF , we utilize undistributed CF measure:

$$CF = \text{operating income before depreciation} - \text{taxes} - \text{interest expense on borrowings} - \text{dividends on ordinary and preferred share} \quad (6)$$

The book value of the total assets standardizes the CF . We used multiple previous types of research (De Miguel & Pindado, 2001; Nekhili et al., 2016; Pindado et al., 2008).

First, we divide the sample into two sub-samples based on the median $SFCF$, the high $SFCF$, and the low $SFCF$. Observations above the median are classified as having a high $SFCF$, while those

below the median are classified as having a low $SFCF$. When a firm's $SFCF$ is high, but its growth rate is low, it is classified as having a potential FCF agency problem (Chung et al., 2005). Then, for a high $SFCF$, there are two samples: one with high $SFCF$ and low growth and another with high $SFCF$ and high gain. The sample with high $SFCF$ and low growth has the potential for agency problems and will be coded

as 1, while all other *SFCFs* will be coded as 0, using the median price-to-value ratio. Whereas one firm has a price-to-book ratio above the median, the other has a low growth rate.

3.3.3. Control variable

Debt ratio: debt is a method agencies use to discipline managers (Denis & Denis, 1995; Jensen, 1986; Lang et al., 1996; Lehn & Poulsen, 1989). Jelinek et al. (2007) demonstrate that an augmentation in indebtedness reduces *EM* in an *FCF* situation. We calculate debt using the debt-to-total-assets ratio.

The natural logarithm of total assets calculates firm size following some prior studies (Rusmin et al., 2014).

4. RESULTS AND DISCUSSIONS

This part presents the empirical results, including regression analysis, correlation analysis, and descriptive statistics of the study variables. Table A.1 in the Appendix, shows the descriptive statistics for the study variables.

The measure of the independent variable, *the discretionary accruals (DAC)*, ranges from the minimum value of -0.878 to the maximum value of 0.367. The reported average value -0.018 for *DAC* was lower than that of Al-Omush et al. (2018, p. 226), who wrote a mean value for *DAC* of 0.0559 for the Jordanian companies listed in ASE for the period 2003-2016. The range of the *DAC* from negative to positive value indicates that sample firms have been involved in both downward and upward earnings management practices but mostly in downward *EM* practices, as the negative mean value suggests for *DAC*. The reported standard deviation 0.072 for the *DAC* is substantially higher than the mean value -0.018, indicating wide variations in the *DAC* among sample firms.

The leverage value ranges from minimum 0.0002 to maximum 0.9981. The reported average value of 0.327 suggests that on average was close to the mean value for *leverage* 0.423 written by an early comparable study carried out on ASE firms reported (Alkhalailah & Almasri, 2016, p. 106).

The value of the *SFCF* ranges from the minimum value -1.031 to the maximum value 0.406. The reported average value of *SFCF* 0.057 was lower than the one written by Mulenga (2015, p. 186), who recorded the mean leverage 0.1545 for Indian firms listed on the Bombay Stock Exchange (BSE).

The CEO duality value ranges from zero to 1. The reported mean value of 0.91 indicates that 91% of the sample firms have separated the board leadership structure in which the *CEO* is also the board's chairman. The value of the existence of *an audit committee (AC)* varies from zero to 1. The reported mean value of 0.67 for *the audit committee* indicates that *the audit committee* exists for 67% of the observations (firm-year). *The audit quality (AQ)* value ranges from zero to 1. The reported mean value of 0.34 indicates that Big-4 auditors audited 34% of the annual Pearson correlation coefficients for the studied variables.

The leading independent variable, *SFCF*, is positively related to *DAC*. The reported correlation coefficient 0.133 was statistically significant at

the conventional level ($\alpha = 0.01$). This finding aligns with the notion that *SFCF* incentivizes management to manage earnings upward. This result is consistent with the study's predictions and most prior related studies' findings (e.g., who reported a positive association between *SFCF* and *DAC*).

Leverage is negatively associated with *DAC*, but the associated correlation coefficient -0.018 is statistically insignificant ($\alpha = 0.01$) at the conventional level ($\alpha = 0.01$). Some studies by a Jordanian firm indicate a negative association between *EM* and *leverage*. *CEO duality* is negatively related to *DAC*. However, the reported correlation coefficient -0.043 is statistically insignificant at the conventional level. Interestingly, the existence of *an audit committee (AC)* is positively related to *DAC*, and the reported correlation coefficient 0.098 is statistically significant ($\alpha = 0.1$) at the conventional level.

In contrast, *audit quality (AQ)* is positively but insignificantly related to *DAC*. Still, the reported correlation coefficient 0.011 is statistically insignificant at the conventional level ($\alpha = 0.1$). Regarding the interaction variable, the interaction of *FCF* with *CEO duality* with *DAC* is positive and statistically significant. Consistent with previous studies and study predictions the audit quality *SFCF* interaction is negatively associated with *DAC*, but the correlation coefficient is statistically insignificant at the conventional level.

The correlation analysis reported in Table A.2 shows a highly significant correlation coefficient 0.944 between *SFCF* and the interaction variable (*SFCF*CEO*). This result provides an early indicator of severe possible multicollinearity problems in the data. The initial regression results show a high VIF value of 2.66 for *CEO*SFCF* interaction variable duality, suggesting a severe collinearity problem in the data. The *CEO duality* variable was excluded from the regression to mitigate this problem. Table A.3 presents the modified model's regression result after excluding the *CEO duality* variable to minimize the collinearity problem. The results in Table A.3 show an F-value of 6.84, indicating that the overall model is statistically significant ($\alpha = 0.01$) at the conventional level. The adjusted R^2 of 0.065 indicates approximately 6.5% of the variations in the dependent variable — *DAC*, explained by the *SFCF* variable and other independent variables in the model. The regression coefficient on *SFCF* (0.273) is positive and statistically significant at the conventional level ($\alpha = 0.01$). This shows that *SFCF* increases a manager's tendency to manage earnings upward. This result is consistent with the study's predictions and prior related studies' findings.

This result also supports that high *SFCF* incentivizes managers to manage earnings, especially for low-growth firms. Additionally, the regression coefficient on *the leverage* effect 0.008 is positive but statistically insignificant ($\alpha = 0.01$) at the conventional level. The regression coefficient on *audit quality* is very low and statistically insignificant at the traditional level ($\alpha = 0.01$). However, the regression coefficient on the interaction of *audit quality* and *SFCF* is negative and statistically significant. These results suggest that *AQ* by itself may not have a substantial direct impact on *EM* activities for companies with high

SFCF. However, the significant coefficient of the interaction variable of *SFCF* and *AQ* indicates a significant moderating effect of *AQ* when the *SFCF* is high, in this case, has a negative moderating effect on managers' tendency to manage earnings upward.

The regression coefficient 0.082 on the *audit committee* (*AC*) is positive and statistically significant at the conventional level ($\alpha = 0.01$). The result shows that *SFCF* affects managers' tendency to manage earnings upward. Also, the *AC* regression coefficient -0.001 is negatively and statistically insignificant ($\alpha = 0.01$) at the conventional level.

5. CONCLUSION

This study examined the association between various independent variables such as *SFCF*, *leverage*, *CEO duality*, and *AQ* and *DAC*. Results showed that *SFCF* positively relates to *DAC*, suggesting that *FCF* incentivizes management to manage earnings upward. The effect of leverage on *DAC* is negative but not statistically significant. *CEO duality* is also negatively related to *DAC*. Interestingly, *AQ* positively connects to *DAC*, but

the association is not statistically significant. The interaction between *FCF*, *CEO duality*, and *DAC* is positive and effective, while the interaction between *AQ* and *DAC* is negative but insignificant. In addition, modifying the model to exclude the *CEO duality* variable resolved the problem of collinearity.

Overall, the results showed that *SFCF* increases management's tendency to manage earnings upward. However, when both *AQ* and *SFCF* are high, there is a negative moderating effect on managers' direction in earnings management. The study findings may be helpful to investors, creditors, and other accounting information users who make economic decisions. The results of this study could be beneficial for local policymakers and those concerned about corporate governance's role in the quality of accounting information.

The main limitation of this research is the Jordanian companies' sample so the results of the study in different country may have different results. Therefore, the main recommendation of this research is to replicate it in different emerging economies contexts and see the relationship between *SFCF* and *EM*.

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APPENDIX

Table A.1. Descriptive statistics for study variables

Variables	Min.	Max.	Mean	Std. Dev.
DAC	-0.8786	0.3678	-0.0182	0.0724
SFCF	-1.031	0.406	0.0577	0.093
LEV	0.0002	0.9981	0.3270	0.224
CEO	0	1	0.91	0.283
AQ	0	1	0.34	0.475
AC	0	1	0.67	0.471
FCF*CEO	-1.0311	0.4061	0.0469	0.0876
FCF*AC	-0.3026	0.4061	0.0241	0.0594
FCF*AQ	-0.4256	0.4061	0.0354	0.0711

Note: DAC is the earnings management measure, discretionary accruals for firm (i) and period (t); LEV is financial leverage, which is equal to the ratio of liability to total assets for the firm (i) and period (t); SFCF is the surplus free cash flow for the firm (i) and period (t); AQ is audit quality of firm I scored one (1) if the auditor is a Big-4 zero otherwise; CEO is the CEO duality for the firm (i) and period (t) scored (1) if chairman and CEO are separated, zero otherwise; AC_{it} is the audit committee for the firm (i) and period (t), scored one (1) if the audit committee is existing zero otherwise; SFCF*CEO is the interaction variable of surplus free cash flow with CEO duality of the firm (i) and period (t); SFCF*AC is the interaction variable of surplus free cash flow with the audit committee of the firm (i) and period (t); SFCF*AQ is the interaction variable of surplus free cash flow with audit quality of firm (i) and period (t).

Table A.2. Correlation analysis results

Variables	DAC	Lev	SFCF	CEO	AC	AQ	SFCF*CEO	SFCF*AC	SFCF*AQ
DAC	1								
LEV	0.002	1							
SFCF	0.133**	-0.181**	1						
CEO	-0.043	0.123**	0.005	1					
AC	0.098*	0.027	0.081*	0.086*	1				
AQ	0.011	0.005	0.380**	0.162**	-0.002	1			
SFCF*CEO	0.137**	-0.158**	0.944**	0.186**	0.096*	0.454**	1		
SFCF*AC	0.083*	-0.123**	0.535**	0.136**	-0.091*	0.388**	0.579**	1	
SFCF*AQ	-0.033	-0.170**	0.691**	0.158**	-0.024	0.684**	0.714**	0.616**	1

Note: DAC is the earnings management measure, discretionary accruals for firm (i) and period (t); LEV is financial leverage, which is equal to the ratio of liability to total assets for the firm (i) and period (t); SFCF is the surplus free cash flow for the firm (i) and period (t); AQ is audit quality of firm I scored one (1) if the auditor is a Big-4 zero otherwise; CEO is the CEO duality for the firm (i) and period (t) scored (1) if chairman and CEO are separated, zero otherwise; AC_{it} is the audit committee for the firm (i) and period (t), scored one (1) if the audit committee is existing zero otherwise; SFCF*CEO is the interaction variable of surplus free cash flow with CEO duality of the firm (i) and period (t); SFCF*AC is the interaction variable of surplus free cash flow with the audit committee of the firm (i) and period (t); SFCF*AQ is the interaction variable of surplus free cash flow with audit quality of firm (i) and period (t); * significant at 0.05 level; ** significant at 0.01 level.

Table A.3. The modified model's regression result after excluding the CEO duality variable to minimize the collinearity problem

Variables	Req. Coeff.	T-value	Sig.	VIF
(Constant)	-0.022	-2.008	0.045	-
FCF	0.273	5.187	< 0.001	1.988
LEV	0.008	0.215	0.830	1.085
AC	0.082	2.086	0.037	1.104
CEO	-0.48	-1.173	0.241	1.184
AQ	0.109	1.908	0.057	2.345
FCF*AC	0.130	2.133	0.033	2.662
FCF*AQ	-0.373	-4.944	< 0.001	4.075
Adj. R ²			0.065	
F-value			6.840	
P			< 0.001	

Note: DAC is the earnings management measure, discretionary accruals for firm (i) and period (t); LEV is financial leverage, which is equal to the ratio of liability to total assets for the firm (i) and period (t); SFCF is the surplus free cash flow for the firm (i) and period (t); AQ is audit quality of firm I scored one (1) if the auditor is a Big-4 zero otherwise; CEO is the CEO duality for the firm (i) and period (t) scored (1) if chairman and CEO are separated, zero otherwise; AC_{it} is the audit committee for the firm (i) and period (t), scored one (1) if the audit committee is existing zero otherwise; SFCF*CEO is the interaction variable of surplus free cash flow with CEO duality of the firm (i) and period (t); SFCF*AC is the interaction variable of surplus free cash flow with the audit committee of the firm (i) and period (t); SFCF*AQ is the interaction variable of surplus free cash flow with audit quality of firm (i) and period (t).