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Earnings quality and type of earnings management in non-stressed and stressed companies

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A B S T R A C T

This paper examines the relationship between earnings management and earnings quality in two countries (93 companies from Tehran Stock Exchange and 92 companies from Saudi Arabia Stock Exchange) for the period (2013-2022 Tehran) and (2014-2023 Saudi Arabia). The data were collected as a year -firm and analyzed using multiple regression. The earnings quality was measured through three separate attributes (earnings predictability, earnings smoothness and relevance of earnings). To achieve the research goals, three hypotheses were developed and, in each hypothesis, the moderating role of one of the earnings quality indicators for each category of non-stressed and distressed companies were studied. The results of the research showed that in all cases of measuring the earnings quality, the earnings management in distressed and non-distressed firms are efficient. Similarly, earnings quality of earnings predictability type in the Tehran Stock Exchange and the earnings quality of relevance type in the Saudi Stock Exchange and the distressed firms, the earnings quality of relevance type in the Tehran Stock Exchange and the earnings quality of earnings smoothness type in the Saudi Stock Exchange can explain future profitability. Moreover, for the first time, the emphasis on the relationship between the attributes of the earnings quality and the type of earnings management and future profitability is introduced globally, especially in Saudi Arabia and Iran. By using international data, the comparison between the approach of Saudi Arabia and the approach of Iran will be done.

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1. Introduction

Corporate losses represent one of the most significant accounting issues due to their substantial impact on financial statement stakeholders and the profound effects they exert on the accounting and auditing profession. This concern has become particularly pronounced following major financial crises and the collapse of large global corporations such as Enron and WorldCom (Sinita, 2016). These events have prompted researchers to revisit their investigations into the underlying causes of such failures, with findings consistently identifying earnings management as a primary contributing factor. Accounting earnings are widely regarded as a key measure of corporate performance, given the extensive user base of financial statements. Numerous empirical studies have emphasized the importance of earnings and earnings-related information (Simini, 2015). Despite certain limitations, decision-makers tend to prioritize accounting earnings over other performance metrics. However, these limitations have led to a situation where accounting earnings no longer accurately reflect the true financial performance of companies. This distortion occurs because managers engage in earnings management by manipulating reported performance and aligning earnings quality with the expectations of investors, shareholders, and other stakeholders. Moreover, users of financial statements often lack the necessary tools to identify the factors that influence earnings, making it difficult to assess the quality of reported earnings. Opportunistic earnings management is typically practiced by weak and financially distressed companies that are persistently depleting their financial resources. Such firms engage in real earnings manipulation or conceal critical information from stakeholders to compensate for past weaknesses and delay bankruptcy declarations. However, if a company persists in managing its earnings opportunistically, it will ultimately face bankruptcy (Hassanpour & Mehdi, 2017). In recent years, the concept of

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earnings quality has gained increased attention as a countermeasure to prevent earnings management practices. Accordingly, this study investigates the type of earnings management, whether efficient or opportunistic, practiced by non-distressed and distressed companies listed on the Tehran Stock Exchange and the Saudi Stock Exchange (KSA).

2.Theoretical foundations, Literature and hypotheses

2.1. Theoretical foundations:

2.1.1. Earnings management

In the accounting literature, various definitions of the concept of earnings management. Balkaoui believes that earnings management results from the stimulation of management incentives to increase the company's annual earnings. Earnings management may also be used to make a deliberate manipulation of earnings seems normal to achieve a desired level of profitability (Belkaoui, 2009). Earnings management is the process of consciously taking steps in line with the accepted accounting requirements to achieve the desired level of earnings (Stacheni & web, 2011). Subramanyam (1996) views earnings management can be divided into two separate and contrasting classifications: efficient and opportunistic. Efficient earnings management means improving the information on the earnings when sending confidential information. In other words, the aims of increasing the quality of information to help investors better understand the power of profitability and financial condition of the company. Opportunistic earnings management changes in financial reports by managers to mislead users about the economic performance of the company to maximize the personal benefits.

2.1.2. Earnings quality

When the accounting methods used to generate earnings are free from biased presentation of financial figures, the resulting earnings are characterized as high-quality earnings (Lo, 2008). Lang and Whitman (2003) define earnings quality as the extent to which earnings are characterized by less earnings management and timely loss recognition. Earnings quality serves as a critical indicator for assessing a company's financial health and is widely considered by investors, creditors, and other users of financial statements. To date, however, there remains no universally accepted definition of earnings quality, and the concept has been defined in numerous ways across the literature.

2.1.3 Financial distress and bankruptcy

Financial distress refers to a reduction in a company's cash flows, occurring when operating cash flows are insufficient to meet debt obligations. In contrast, financial bankruptcy, as defined by Altman (1968), occurs when a company is entirely unable to repay its debts. Joseph (2005) emphasizes that the distinction between financial distress and financial bankruptcy lies in the application of the financial flexibility criterion. According to this framework, financial distress is characterized by the presence of at least one of the following two conditions: (1) a reduction or cessation of stock returns; and (2) an inability to pay debts when they fall due. Bankruptcy, on the other hand, is determined by at least one of two scenarios: (1) a general inability to repay debts; and (2) the winding up or liquidation of the company.

2.2. Literature Review

Numerous scholars have documented evidence suggesting that earnings management incentives are predominantly opportunistic. Gaver et al. (1995) and Holthausen et al. (1995) provided evidence indicating that accrual manipulation occurs to achieve earnings-based rewards. Balsam et al. (2002) investigated the negative relationship between discretionary accruals and stock returns around earnings announcement dates, concluding that the market perceives discretionary accruals as opportunistic. Conversely, Subramanyam (1996), Kirschenheiter and Melumad (2004), Gul et al. (2000), and Kothari et al. (2005) argue that discretionary accruals are consistent with efficient earnings management, as they exhibit a positive and significant relationship with future profitability. Finn, Lee, and colleagues (2011) examined earnings management and the impact of earnings quality on the level of distress and bankruptcy among Chinese firms. Their findings indicated that distressed and bankrupt firms engaged in more opportunistic earnings management, whereas non-bankrupt, non-distressed firms tended to manage earnings efficiently. They also found that earnings quality was higher in non-distressed firms and lower in distressed firms. Demerjian et al. (2013) investigated the impact of managerial ability on the qualitative characteristics of earnings and found a positive relationship between managerial ability and each of the four earnings characteristics examined. They further concluded that managerial ability directly affects the sustainability of earnings in the accruals sector. Wilson and Regent (2016), in a study entitled “A Framework for Non-Professional Investors to Understand Earnings Quality”, discussed the importance of accruals in the earnings process and provided a framework for evaluating the various methods of earnings management that non-professional investors should consider when assessing earnings quality. Erden and Ornen (2017) examined the relationship between earnings quality, remittances, derivatives, and other parameters affecting payroll accounting. Their results indicated that derivative instruments increase earnings fluctuations, whereas remittance calculations do not have a diminishing effect on such fluctuations. The study also found no significant relationship between discretionary accruals and derivatives.

3. Research Methodology

This section presents the research methodology employed in this study. To test the proposed hypotheses, the sample companies are first classified into two distinct groups, non-distressed and distressed, based on the Ohlson (1980) bankruptcy prediction model (Kleinert, 2014; Timermans, 2014). The Ohlson model is specified as follows:

$O_i = -1.3 - 0.4X_1 + 6.0X_2 - 1.4X_3 + 0.08X_4 - 2.4X_5 - 1.8X_6 + 0.3X_7 - 1.7X_8 - 0.5X_9$

Measurement of Variables

4.1 Independent Variables

This study employs two independent variables: earnings quality and earnings management.

4.1.1 Earnings Quality

Earnings quality is operationalized through three distinct characteristics: earnings predictability, earnings smoothness, and earnings relevance.

4.1.1.1 Earnings Predictability

Earnings predictability is measured using the Kormendi and Lipe (1987) model, as follows:

$$\frac{Earn_{j,t}}{Total\ Asset_{j,t-1}} = \alpha + \delta\left(\frac{Earn_{j,t-1}}{Total\ Asset_{j,t-1}}\right) + V_{j,t}$$

Subsequently, earnings predictability is computed as the square root of the error variance derived from the Kormendi and Lipe (1987) model, expressed as:

$$Pred_{j,t} = \sqrt{\sigma^2(\hat{V}_{j,t})}$$

Interpretation of Earnings Predictability

Higher values of predictability indicate lower earnings predictability, implying poorer earnings quality. Conversely, lower values of predictability suggest higher earnings predictability, reflecting superior earnings quality. In essence, more predictable earnings are associated with higher quality, whereas less predictable earnings are associated with lower quality.

4.1.1.2. Earnings smoothness is measured as the standard deviation of operating cash flows divided by the standard deviation of earnings. Similarly, Francis et al. (2004) measure earnings smoothness as the ratio of the standard deviation of net income before extraordinary items divided by the total assets at beginning of the year, by the standard deviation of cash flow from operations divided by total assets at beginning of the year.

$$\text{Smooth} = \frac{\sigma(\ CFO_{j,t}/TotalAssets_{j,t-1})}{\sigma(\ Earn_{j,t}/TotalAssets_{j,t-1})}$$

Thus, large (small) values of Smooth indicate more (less) earnings smoothness and low (high) earnings quality.

4.1.1.3. Relevance of earnings: The model of Francis et al. (2004) study is used to calculate the earnings relevance.

$$RET_{j,t} = \delta_{0,j} + \delta_{1,j}EARN_{j,t} + \delta_{2,j}\Delta EARN_{j,t} + \varepsilon_{j,t}$$

To operationalize this variable within the research methodology, a five-year observation period is considered for each company to compute the adjusted negative value of R^2 derived from the aforementioned equation. The relevance of earnings is represented by the negative adjusted R^2 ($-R^2_{j,t}$). A larger (smaller) value of $-R^2$ corresponds to lower (higher) relevance of earnings, thereby indicating lower (higher) earnings quality (Francis et al., 2004). The coefficient of determination obtained from the estimation of the earnings model serves as an indicator of the relevance of earnings to stock value. Specifically, earnings relevance reflects the extent to which accounting earnings explain changes in stock returns.

4.1.2. Earnings management: Discretionary accruals are an agent for earnings management, to measure discretionary accruals, he modified Jones model is used first introduced by (Dechow et al. 1995) as a modification of the original Jones model. Total accruals ($TA_{j,t}$) are calculated as follows:

$$TA_{j,t} = \Delta CA_{j,t} - \Delta CL_{j,t} - \Delta Cash_{j,t} + \Delta STD_{j,t} - DEP_{j,t}$$

The modified Jones model (Dechow et al., 1995) is employed to estimate non-discretionary accruals ($NDA_{j,t}$) using the following regression equation:

$$\frac{TA_{j,t}}{A_{j,t-1}} = \alpha_1\left(\frac{1}{A_{j,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{j,t} - \Delta REC_{j,t}}{A_{j,t-1}}\right) + \alpha_3\left(\frac{PPE_{j,t}}{A_{j,t-1}}\right) + \varepsilon_{j,t}$$

The fitted values from the above regression represent non-discretionary accruals ($NDA_{j,t}$), calculated as:

$$NDA_{j,t} = \alpha_1\left(\frac{1}{A_{j,t-1}}\right) + \alpha_2\left(\frac{\Delta REV_{j,t} - \Delta REC_{j,t}}{A_{j,t-1}}\right) + \alpha_3\left(\frac{PPE_{j,t}}{A_{j,t-1}}\right)$$

Discretionary accruals ($DA_{j,t}$) are then computed as the difference between total accruals and non-discretionary accruals:

$$DA_{j,t} = \frac{TA_{j,t}}{A_{j,t-1}} - NDA_{j,t}$$

where:

variable	Description
$\mathbf{TA_{j,t}}$	Total accruals for firm j in year t
$\mathbf{\Delta CA_{j,t}}$	Change in current assets
$\mathbf{\Delta CL_{j,t}}$	Change in current liabilities
$\mathbf{\Delta Cash_{j,t}}$	Change in cash and cash equivalents
$\mathbf{\Delta STD_{j,t}}$	Change in short-term debt
$\mathbf{DEP_{j,t}}$	Depreciation and amortization expense
$\mathbf{A_{j,t-1}}$	Total assets at the beginning of the year
$\mathbf{\Delta REV_{j,t}}$	Change in revenues (sales)
$\mathbf{\Delta REC_{j,t}}$	Change in accounts receivable
$\mathbf{PPE_{j,t}}$	Gross property, plant, and equipment

4.2 Dependent Variable

Future profitability ($X_{j,t+1}$) is operationalized using any of the following three measures:

- $\mathbf{\Delta NI_{j,t+1}}$ = Change in net profit one year ahead, calculated as ($NI_{j,t+1} - NI_{j,t}$)
- $\mathbf{CFO_{j,t+1}}$ = Cash flows from operating activities one year ahead
- $\mathbf{NDNI_{j,t+1}}$ = Future non-discretionary net profit, calculated as ($CFO_{j,t+1} + NDA_{j,t+1}$)

4.3 Research Method and Hypothesis Testing

To test the research hypotheses, this study employs multiple linear regression analysis using the following model:

$$X_{j,t+1} = \beta_0 + \beta_1 DA_{j,t} + \beta_2 CFO_{j,t} + \beta_3 Size_{j,t} + \beta_4 Lev_{j,t} + \beta_5 MTB_{j,t} + \beta_6 Loss_{j,t} + \beta_7 Growth_{j,t} + \beta_8 AttributeK_{j,t} + \sum Year + \sum Industry + \varepsilon_{j,t}$$

where the variables are defined as follows:

Variable	Description
$\mathbf{X_{j,t+1}}$	Future profitability (dependent variable)
$\mathbf{DA_{j,t}}$	Discretionary accruals
$\mathbf{CFO_{j,t}}$	Cash flows from operating activities
$\mathbf{AttributeK_{j,t}}$	The variable related to the earnings quality attribute (K represents each of the earnings quality characteristics: predictability, smoothness, and relevance)
$\mathbf{Size_{j,t}}$	Company size (natural logarithm of sales)
$\mathbf{Lev_{j,t}}$	Financial leverage (total debt to total assets ratio)
$\mathbf{MTB_{j,t}}$	Market-to-book ratio (market value of equity to book value of equity)
$\mathbf{Loss_{j,t}}$	Loss indicator (dummy variable: 1 if net income is negative, 0 otherwise)
$\mathbf{Growth_{j,t}}$	Sales growth (percentage change in sales from year t−1 to year t)
$\mathbf{\sum Year}$	Year fixed effects
$\mathbf{\sum Industry}$	Industry fixed effects
$\boldsymbol{\varepsilon_{j,t}}$	Error term

4.4 Hypothesis Testing Criteria

The hypotheses are tested based on the estimated coefficients as follows:

β_1 ($DA_{j,t}$): If the estimated coefficient is **significantly positive**, it indicates **efficient earnings management**. If the coefficient is **insignificant or significantly negative**, it indicates **opportunistic earnings management**.

β_8 ($AttributeK_{j,t}$): If the estimated coefficient is **statistically significant**, it confirms the role of earnings quality in predicting future profitability.

5. Test of hypotheses:

5.1. Test of hypotheses in Tehran Stock Exchange:

5.1.1. Test of the 1st hypothesis: (earnings quality as predictability)

The research model estimation results of the data of the non-distressed firms of Tehran are presented in Table 1. According to the table results, the variable coefficient of discretionary accruals (b_1) in the last two models has a positive significant value (t-statistics =3.872, significance =0.000 and t-statistics=5.035, significance =0.000), which indicates that the earnings management is efficient. While this was not significant in the first model. earnings quality variable (b_8) also has a negative significant coefficient in the first and third models (t-statistics = -2.975, significance = 0.003 and t-statistics = - 2.382, t =

2.382, significance = 0.018) which shows that the earnings quality in non-distressed firms is capable of explaining the future profitability.

Table 1
The estimated results of the data of the non-distressed firms of Tehran

Model / The dependent variable	First Model $\Delta NI_{i,t+1}$		Second Model $CFO_{i,t+1}$		Third Model $NDNI_{i,t+1}$	
	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	-0.013	-0.196 (0.845)	0.054	0.878 (0.381)	0.081	1.552 (0.122)
$DA_{j,t}$	-0.027	-0.296 (0.767)	0.304	3.872*** (0.000)	0.330	5.035*** (0.000)
$CFO_{j\,t}$	0.027	0.397 (0.692)	0.596	8.506*** (0.000)	0.666	11.069*** (0.000)
$Size_{j\,t}$	0.012	2.120* (0.035)	0.003	0.585 (0.559)	0.003	0.711 (0.477)
$Lev_{j,t}$	-0.169	-3.698*** (0.000)	-0.053	-1.337 (0.182)	-0.097	-2.391* (0.017)
$MTB_{i,t}$	0.029	6.827*** (0.000)	0.014	3.163** (0.002)	0.017	4.237*** (0.000)
$Loss_{j,t}$	0.081	2.753** (0.006)	0.038	1.891 (0.059)	0.025	0.921 (0.358)
$Growth_{j,t}$	0.020	1.026 (0.305)	-0.025	-1.173 (0.241)	0.002	0.146 (0.884)
$Attribute^{K}_{j,t}$	-0.592	-2.975** (0.003)	-0.172	-1.004 (0.316)	-0.411	-2.382* (0.018)
R^2,The adjusted R^2	0.342	0.312	0.449	0.424	0.599	0.580
f-statistics and significance	11.365	0.000	17.871	0.000	32.667	0.000

Considering that the type of earnings management in non-distressed firms is efficient and the earnings quality's capability of explaining future profitability, the first hypothesis of research is accepted in non-distressed firms, Table 2 shows this.

Table 2
The summary of testing the first hypothesis

Model / The dependent variable	First Model $\Delta NI_{i,t+1}$		Second Model $CFO_{i,t+1}$		Third Model $NDNI_{i,t+1}$	
	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	0.480	1.432 (0.162)	0.395	2.128* (0.041)	0.133	0.642 (0.525)
$DA_{j,t}$	0.304	1.517 (0.139)	0.456	3.399** (0.002)	0.517	4.411*** (0.000)
$CFO_{j\,t}$	-0.044	-0.202 (0.841)	0.550	2.696* (0.011)	0.722	4.205*** (0.000)
$Size_{j\,t}$	-0.040	-1.809 (0.080)	-0.018	-1.327 (0.194)	-0.008	-0.548 (0.587)
$Lev_{j,t}$	-0.028	-0.462 (0.647)	-0.045	-1.144 (0.261)	0.022	0.765 (0.450)
$MTB_{j,t}$	-0.005	-1.217 (0.232)	-0.001	-0.171 (0.866)	-0.000	-0.038 (0.970)
$Loss_{j,t}$	0.142	2.411* (0.022)	0.077	1.694 (0.100)	0.038	0.863 (0.395)
$Growth_{j,t}$	-0.010	-0.216 (0.830)	0.047	1.720 (0.095)	0.053	1.359 (0.183)
$Attribute^{K}_{j,t}$	1.305	1.045 (0.303)	-0.721	-0.924 (0.362)	-0.472	-0.550 (0.586)
R^2,The adjusted R^2	0.395	0.066	0.701	0.538	0.668	0.487
f-statistics and significance	1.199	0.316	4.303	0.000	3.688	0.001

According to the table results, the first model is not interpretable due to the insignificance of the f- statistics. The variable coefficient of discretionary accruals (b_1) in both other models has a positive significant value (t-statistics = 3.392, significance = 0.002 and t- statistics = 4.411, significance = 0.000) indicating that the earnings management is efficient. The earnings quality variable (b_8) is also not significant in any of the models, suggests that the earnings quality is not capable of explaining future profitability in distressed firms. Considering that the earnings management in the distressed firms is efficient and the earnings quality is not capable of explaining future profitability, the first hypothesis of research in distressed firms is not accepted.

5.1.2. Test of the 2nd hypothesis: (earnings quality as relevance)

The research model estimation results on the data of the non-distressed firms of Tehran are presented in Table 3.

Table 3
The research model estimation results on the data of the non-distressed firms of Tehran

Model / The dependent variable	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	-0.020	-0.242 (0.809)	0.026	0.310 (0.757)	0.014	0.206 (0.837)
$DA_{j,t}$	-0.109	-1.138 (0.256)	0.283	3.765*** (0.000)	0.280	4.348*** (0.000)
$CFO_{j\,t}$	-0.036	-0.517 (0.605)	0.580	8.784*** (0.000)	0.627	10.915*** (0.000)
$Size_{j\,t}$	0.010	1.600 (0.110)	0.004	0.682 (0.495)	0.006	1.219 (0.224)
$Lev_{j,t}$	-0.160	-3.567*** (0.000)	-0.051	-1.299 (0.195)	-0.092	-2.337* (0.020)
$MTB_{j,t}$	0.027	6.305*** (0.000)	0.013	3.112** (0.002)	0.015	3.905*** (0.000)
$Loss_{j,t}$	0.069	2.183* (0.030)	0.035	1.752 (0.081)	0.018	0.630 (0.529)
$Growth_{j,t}$	0.023	1.173 (0.241)	-0.025	-1.161 (0.246)	0.003	0.163 (0.871)
$Attribute^{K}_{j,t}$	696.060	0.374 (0.709)	1240.873	0.674 (0.501)	2891.334	1.879 (0.061)
R^2,The adjusted R^2	0.320	0.289	0.448	0.423	0.593	0.575
f-statistics and significance	10.318	0.000	17.800	0.000	31.934	0.000

According to the table results, the variable coefficient of discretionary accruals (b_1) in both other models has a positive The results indicate statistically significant positive coefficients (t-statistics = 3.765, $p < 0.001$; and t-statistics = 4.348, $p < 0.001$), suggesting that earnings management is efficient. However, the earnings quality variable (β_8) is not significant in any of the models, indicating that earnings quality does not explain future profitability in non-distressed firms. Given that earnings management in non-distressed firms is efficient, and considering the inability of earnings quality to predict future profitability, only the first proposition of the second hypothesis is accepted for non-distressed firms. These results are presented in Table 4.

Table 4
The summary of testing the hypothesis of the survey

Model / The dependent variable	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	1.170	2.084* (0.045)	0.309	1.167 (0.252)	0.227	0.622 (0.538)
$DA_{j,t}$	0.253	1.337 (0.190)	0.464	3.259** (0.003)	0.513	4.171*** (0.000)
$CFO_{j\,t}$	-0.031	-0.151 (0.881)	0.554	2.668* (0.012)	0.731	4.134*** (0.000)
$Size_{j\,t}$	-0.076	-2.209* (0.034)	-0.016	-0.885 (0.383)	-0.016	-0.660 (0.514)
$Lev_{j,t}$	-0.062	-0.963 (0.342)	-0.038	-0.973 (0.338)	0.021	0.630 (0.533)
$MTB_{j,t}$	-0.005	-1.128 (0.267)	-0.001	-0.352 (0.727)	-0.000	-0.185 (0.855)
$Loss_{j,t}$	0.139	2.425* (0.021)	0.073	1.547 (0.131)	0.033	0.794 (0.433)
$Growth_{j,t}$	0.014	0.371 (0.713)	0.032	1.208 (0.236)	0.042	1.206 (0.236)
$Attribute^{K}_{j,t}$	-15188.020	-1.649 (0.109)	1294.529	0.227 (0.822)	-2761.578	-0.486 (0.630)
R^2,The adjusted R^2	0.429	0.118	0.695	0.528	0.667	0.486
f-statistics and significance	1.378	0.207	4.171	0.000	3.677	0.001

According to the table results, the first model is not interpretable due to the insignificance of the f-statistics. The variable coefficient of discretionary accruals (b_1) in both other models has a positive significant value (t-statistics =3.259, significance =0.003 and t- statistics =4.171, significance = 0.000) indicating that the earnings management is efficient. The earnings quality variable (b_8) is non- significant in all models, suggesting that the earnings quality is not capable of explaining the future profitability in distressed firms. Considering that the type of earnings management in the distressed firms is efficient and also the earnings quality cannot explain the future profitability, the second hypothesis of research in distressed firms is not accepted.

5.1.3.Test of the 3rd hypothesis: (earnings quality as smoothness)

The research model estimation results on the data of non- distressed firms of Tehran are presented in Table 5.

Table 5
The results on the data of non- distressed firms of Tehran

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	-0.004	-0.065 (0.948)	0.056	0.866 (0.387)	0.071	1.316 (0.189)
$DA_{j,t}$	-0.110	-1.127 (0.260)	0.280	3.681*** (0.000)	0.274	4.232*** (0.000)
$CFO_{j\,t}$	-0.037	-0.539 (0.590)	0.577	8.710*** (0.000)	0.621	10.771*** (0.000)
$Size_{j\,t}$	0.009	1.760 (0.079)	0.002	0.440 (0.660)	0.002	0.380 (0.704)
$Lev_{j,t}$	-0.159	-3.571*** (0.000)	-0.050	-1.278 (0.202)	-0.092	-2.317* (0.021)
$MTB_{j,t}$	0.027	6.356*** (0.000)	0.013	3.118** (0.002)	0.016	4.053*** (0.000)
$Loss_{j,t}$	0.069	2.157* (0.032)	0.034	1.721 (0.086)	0.016	0.535 (0.593)
$Growth_{j,t}$	0.024	1.198 (0.231)	-0.024	-1.120 (0.263)	0.005	0.311 (0.756)
$Attribute^{K}_{j,t}$	0.003	0.155 (0.877)	0.002	0.115 (0.909)	0.025	1.347 (0.179)
R^2,The adjusted R^2	0.320	0.289	0.448	0.423	0.592	0.573
f-statistics and significance	10.310	0.000	17.754	0.000	31.740	0.000

According to the table results, the variable coefficient of discretionary accruals (b_1) in both other models has a positive significant value (t-statistics =3.681, significance =0.000 and t-statistics =4.232, significance =0.000) indicating that the earnings management is efficient. The earnings quality variable (b_8) is also not significant in any of the models, suggests that the earnings quality is not capable of explaining the future profitability in non-distressed firms. Considering that the earnings management in the non-distressed firms is efficient and the earnings quality is not the capable capability of explaining the future profitability, only the first proposition from the third hypothesis of the research is accepted in non-distressed firms, Table 6 shows this.

Table 6
The results of testing the third hypothesis of the survey

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	0.386	1.119 (0.271)	0.652	3.564** (0.001)	0.215	0.932 (0.358)
$DA_{j,t}$	0.284	1.469 (0.151)	0.481	4.330*** (0.000)	0.527	4.624*** (0.000)
$CFO_{j\,t}$	-0.081	-0.382 (0.705)	0.605	3.365** (0.002)	0.744	4.317*** (0.000)
$Size_{j\,t}$	-0.031	-1.458 (0.154)	-0.033	-2.840** (0.008)	-0.013	-0.880 (0.385)
$Lev_{j,t}$	-0.035	-0.591 (0.559)	-0.045	-1.376 (0.178)	0.024	0.824 (0.416)
$MTB_{j,t}$	-0.005	-1.092 (0.283)	-0.001	-0.387 (0.701)	-0.000	-0.176 (0.861)
$Loss_{j,t}$	0.172	2.838** (0.008)	0.031	0.788 (0.436)	0.020	0.482 (0.633)
$Growth_{j,t}$	0.014	0.366 (0.717)	0.040	1.710 (0.097)	0.046	1.331 (0.192)
$Attribute^{K}_{j,t}$	0.102	0.964 (0.342)	-0.193	-2.921** (0.006)	-0.068	-1.130 (0.267)
R^2,The adjusted R^2	0.393	0.062	0.765	0.636	0.673	0.495
f-statistics and significance	1.188	0.325	5.958	0.000	3.781	0.000

According to the table results, the first model is not interpretable due to the insignificance of the f-statistics. The variable coefficient of discretionary accruals (b_1) in both other models has a positive significant value (t-statistics =3.569, significance= 0.001 and t- statistics= 4.408, significance= 0.000) indicating that the earnings management is efficient. The earnings quality variable (b_8) also coefficient in the second model (t-statistics =-2.921, significance =0.006) which shows that the earnings quality in distressed firms is capable of explaining the future profitability. Considering that the type of earnings management in distressed firms is efficient and the earnings quality's capability of explaining future profitability, only the second proposition from the third hypothesis of the research is accepted in distressed firms.

5.2.Test of hypotheses in Saudi Stock Exchange

5.2.1.Test of the 1st hypothesis. (earnings quality as predictability)

The research model estimation results on the data of the non-distressed firms of Saudi are presented in Table 7.

Table 7
The summary of testing the results on Saudi Stock Market

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	-0.012	-0.780 (0.436)	0.114	1.093 (0.275)	-0.083	-0.705 (0.481)
$DA_{j,t}$	0.038	1.225 (0.221)	0.013	0.364 (0.716)	0.399	2.565* (0.011)
$CFO_{j\,t}$	-0.007	-0.161 (0.873)	0.627	4.527*** (0.000)	1.014	7.972*** (0.000)
$Size_{j\,t}$	0.001	0.896 (0.371)	-0.003	-0.600 (0.549)	0.010	1.811 (0.071)
$Lev_{j,t}$	0.008	1.960 (0.051)	-0.042	-5.045*** (0.000)	-0.166	-7.094*** (0.000)
$MTB_{j,t}$	0.001	0.453 (0.651)	-0.000	-0.207 (0.836)	0.002	0.354 (0.723)
$Loss_{j,t}$	-0.064	-2.430* (0.016)	-0.060	-1.255 (0.210)	-0.063	-1.308 (0.192)
$Growth_{j,t}$	0.000	0.889 (0.375)	-0.001	-1.490 (0.137)	-0.001	-1.611 (0.108)
$Attribute^{K}_{j,t}$	-0.106	-0.547 (0.585)	-0.395	-0.617 (0.538)	0.658	1.228 (0.220)
R^2,The adjusted R^2	0.105	0.070	0.069	0.033	0.287	0.259
f-statistics and significance	3.002	0.000	1.902	0.022	10.269	0.000

According to the table results, the variable coefficient of discretionary accruals (b_1) is positive significant only in the last model (t-statistics =2.565, significance =0.011) indicating that the earnings management is efficient, while the first and two models, this has not been significant. The earnings quality variable (b_8) has been non-significant in all models, which shows that earnings quality is not capable of explaining the future profitability in non-distressed firms. Considering that the type of earnings management in non-distressed firms is efficient and the earnings quality is not capable of explaining future profitability, only the first proposition of the first hypothesis of research in non-distressed firms is accepted, Table 8 shows this.

Table 8
The summary of testing the hypothesis

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	0.131	0.650 (0.522)	0.140	0.802 (0.431)	0.044	0.531 (0.601)
$DA_{j,t}$	0.346	1.539 (0.138)	0.165	1.194 (0.245)	0.823	12.467*** (0.000)
$CFO_{j\,t}$	-0.227	-1.478 (0.154)	0.284	1.318 (0.201)	0.810	11.893*** (0.000)
$Size_{j\,t}$	-0.007	-0.634 (0.533)	-0.005	-0.600 (0.555)	-0.001	-0.196 (0.846)
$Lev_{j,t}$	0.008	0.061 (0.952)	0.176	1.925 (0.067)	0.071	1.357 (0.188)
$MTB_{j,t}$	0.006	0.495 (0.625)	0.008	0.833 (0.414)	-0.001	-0.599 (0.555)
$Loss_{j,t}$	-0.034	-0.259 (0.798)	-0.325	-2.602* (0.016)	-0.042	-1.768 (0.091)
$Growth_{j,t}$	0.114	1.472 (0.155)	-0.033	-0.685 (0.501)	-0.036	-1.021 (0.318)
$Attribute^{K}_{j,t}$	1.849	1.135 (0.268)	-0.227	-0.109 (0.914)	-1.039	-1.185 (0.249)
R^2,The adjusted R^2	0.203	-0.087	0.699	0.590	0.931	0.906
f-statistics and significance	0.698	0.690	6.401	0.000	37.258	0.000

According to the table results, the first model is not interpretable due to the insignificance of the f-statistics. The variable coefficient of discretionary accruals (b_1) in the third model has a positive significant value (t-statistics= 12.467, significance = 0.000) indicating that earnings management is efficient. Earning quality variable (b_8) has been non-significant in all models, indicating that earnings quality is not capable of explaining the future profitability in distressed firms. Considering that the type of earnings management in the distressed firms is efficient and the earnings quality is not capable of explaining the future profitability, the first hypothesis of research in distressed firms is not accepted.

5.2.2.Test of the 2nd hypothesis: (earnings quality as relevance)

The research model estimation results on the data of the non-distressed firms of Tehran are presented in Table 9.

Table 9
The results of testing the hypothesis of the survey

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
$DA_{j,t}$	-0.016	-0.853 (0.394)	0.101	1.082 (0.280)	-0.087	-0.816 (0.415)
$CFO_{j\,t}$	0.038	1.221 (0.223)	0.013	0.333 (0.739)	0.402	2.554* (0.011)
$Size_{j\,t}$	-0.010	-0.264 (0.792)	0.613	4.010*** (0.000)	1.028	7.984*** (0.000)
$Lev_{j,t}$	0.001	1.005 (0.316)	-0.003	-0.581 (0.562)	0.010	1.842 (0.066)
$MTB_{j,t}$	0.007	1.909 (0.057)	-0.043	-6.080*** (0.000)	-0.164	-7.399*** (0.000)
$Loss_{j,t}$	0.001	0.425 (0.671)	-0.001	-0.391 (0.696)	0.002	0.436 (0.663)
$Growth_{j,t}$	-0.064	-2.377* (0.018)	-0.060	-1.354 (0.176)	-0.070	-1.533 (0.126)
$Attribute^{K}_{j,t}$	0.000	0.875 (0.382)	-0.001	-1.519 (0.130)	-0.001	-1.834 (0.067)
$DA_{j,t}$	0.000	0.071 (0.943)	0.000	0.045 (0.964)	0.010	1.345 (0.180)
R^2,The adjusted R^2	0.103	0.068	0.068	0.032	0.286	0.258
f-statistics and significance	2.938	0.000	1.870	0.025	10.199	0.000

According to the table results, the variable coefficient of discretionary accruals (b_1) in the third model has a positive significant value (t-statistics= 2.554, significance = 0.011) indicating that the earnings management is efficient. Earning quality variable (b_8) has been non-significant in all models, indicating that earnings quality is not capable of explaining the future profitability in non- distressed firms. Considering that the type of earnings management in the non-distressed firms

is efficient and the earnings quality is not capable of explaining the future profitability, only the first proposition of the second hypothesis of research in non-distressed firms is accepted, Table 10 shows this.

Table 10
The summary of testing the hypothesis of the survey

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	0.127	0.635 (0.532)	0.052	0.460 (0.650)	0.033	0.372 (0.713)
$DA_{j,t}$	0.306	1.386 (0.180)	0.176	2.101* (0.047)	0.846	13.631*** (0.000)
$CFO_{j\,t}$	-0.213	-1.448 (0.162)	0.419	3.412** (0.003)	0.822	10.783*** (0.000)
$Size_{j\,t}$	-0.005	-0.496 (0.625)	-0.003	-0.548 (0.589)	-0.002	-0.378 (0.709)
$Lev_{j,t}$	0.016	0.127 (0.900)	0.120	1.431 (0.166)	0.058	1.016 (0.321)
$MTB_{j,t}$	0.006	0.473 (0.641)	0.005	0.742 (0.466)	-0.001	-0.844 (0.408)
$Loss_{j,t}$	-0.046	-0.334 (0.741)	-0.319	-3.521** (0.002)	-0.034	-1.483 (0.152)
$Growth_{j,t}$	0.102	1.357 (0.189)	-0.069	-1.423 (0.169)	-0.035	-0.995 (0.330)
$Attribute^{K}_{j,t}$	0.004	0.250 (0.805)	0.038	3.408** (0.003)	0.004	1.299 (0.207)
R^2,The adjusted R^2	0.191	-0.103	0.813	0.745	0.928	0.901
f-statistics and significance	0.649	0.729	11.952	0.000	35.263	0.000

According to the table results, the first model is not interpretable due to the insignificance of the f-statistics. The variable coefficient of discretionary accruals (b_1) in the second and third models has a positive significant value (t-statistics= 3.412, significance =0.003 and t-statistics= 10.783, significance = 0.000) indicating that the earnings management is efficient. The earnings quality variable (b_8) also coefficient in the second model (t-statistics =3.408, significance =0.003) which shows that the earnings quality in distressed firms is capable of explaining the future profitability. Considering that the type of earnings management in distressed firms is efficient and the earnings quality's capability of explaining future profitability, only the second proposition from the third hypothesis of the research is accepted in distressed firms.

5.2.3.Test of the 3rd hypothesis: (earnings quality as smoothness)

The research model estimation results on the data of non- distressed firms of Tehran are presented in Table 11.

Table 11
The summary of testing the hypothesis

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	-0.012	-0.611 (0.542)	0.157	1.039 (0.300)	-0.175	-1.533 (0.126)
$DA_{j,t}$	0.038	1.223 (0.222)	0.017	0.501 (0.617)	0.391	2.587* (0.010)
$CFO_{j\,t}$	-0.009	-0.227 (0.821)	0.635	4.709*** (0.000)	0.993	8.312*** (0.000)
$Size_{j\,t}$	0.001	0.884 (0.377)	-0.004	-0.637 (0.524)	0.011	2.129* (0.034)
$Lev_{j,t}$	0.007	1.917 (0.056)	-0.045	-7.139*** (0.000)	-0.161	-7.493*** (0.000)
$MTB_{j,t}$	0.001	0.416 (0.678)	-0.001	-0.559 (0.576)	0.003	0.645 (0.519)
$Loss_{j,t}$	-0.064	-2.382* (0.018)	-0.063	-1.253 (0.211)	-0.056	-1.174 (0.241)
$Growth_{j,t}$	0.000	0.882 (0.378)	-0.001	-1.439 (0.151)	-0.001	-1.388 (0.166)
$Attribute^{K}_{j,t}$	-0.005	-0.536 (0.592)	-0.066	-0.813 (0.417)	0.133	2.153* (0.032)
R^2,The adjusted R^2	0.104	0.069	0.072	0.036	0.298	0.271
f-statistics and significance	2.953	0.000	1.980	0.016	10.833	0.000

According to the table results, the variable coefficient of discretionary accruals (b_1) has a positive significant value in the last model (t-statistics =2.587, significance =0.010) indicating that the earnings management is efficient, while the first two models, this has not been significant. The earnings quality variable (b_8) is positive significant only in the third model (t-statistics =2.153, significance=0.032), indicating that the earnings quality in non-distressed firms is capable of explaining the future profitability. Considering that the type of earnings management in non-distressed firms is efficient and the earnings quality is capable of explaining future profitability, the third hypothesis of research is accepted in non-distressed firms, Table 12 shows this.

According to the table results, the first model is not interpretable due to the insignificance of the f-statistics. The variable coefficient of discretionary accruals (b_1) in the third model has a positive significant value (t-statistics= 15.373, significance =0.000) indicating that earnings management is efficient. Earning quality variable (b_8) has been non-significant in all models, indicating that earnings quality is not capable of explaining the future profitability in distressed firms. Considering that the type of earnings management in the distressed firms is efficient and the earnings quality is not capable of explaining the future profitability, the third hypothesis of research in distressed firms is not accepted.

Table 12
The results of testing the hypothesis

Model	First Model $\Delta NI_{j,t+1}$		Second Model $CFO_{j,t+1}$		Third Model $NDNI_{j,t+1}$	
The dependent variable	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)	Coefficient	t-statistics (significance)
b_0	0.060	0.364 (0.720)	0.134	0.831 (0.415)	0.032	0.401 (0.692)
$DA_{j,t}$	0.370	1.664 (0.110)	0.175	1.242 (0.227)	0.854	15.373*** (0.000)
$CFO_{j\,t}$	-0.312	-1.561 (0.133)	0.277	1.316 (0.202)	0.799	12.925*** (0.000)
$Size_{j\,t}$	-0.006	-0.672 (0.508)	-0.005	-0.652 (0.521)	-0.002	-0.516 (0.611)
$Lev_{j,t}$	-0.035	-0.216 (0.831)	0.170	1.799 (0.086)	0.057	1.022 (0.318)
$MTB_{j,t}$	0.010	0.849 (0.405)	0.008	0.848 (0.405)	-0.000	-0.132 (0.896)
$Loss_{j,t}$	-0.105	-0.801 (0.432)	-0.328	-2.487* (0.021)	-0.042	-1.846 (0.078)
$Growth_{j,t}$	0.103	1.785 (0.088)	-0.032	-0.651 (0.522)	-0.031	-1.001 (0.328)
$Attribute^K_{j,t}$	0.203	1.890 (0.072)	0.016	0.334 (0.741)	0.024	0.718 (0.480)
R^2,The adjusted R^2	0.366	0.136	0.701	0.592	0.930	0.904
f-statistics and significance	1.590	0.185	6.441	0.000	36.391	0.000

6. Summary and conclusion

This study has examined three earnings quality attributes and the type of earnings management (efficient versus opportunistic) in financially distressed and non-distressed firms listed on the Tehran Stock Exchange and the Saudi Stock Exchange.

The results have indicated that earnings management is efficient across all earnings quality measures in both distressed and non-distressed firms. These findings corroborate prior research (Subramanyam, 1996; Kirschenheiter & Melumad, 2004; Gul et al., 2000; Kothari et al., 2005) supporting efficient earnings management, but contradict studies by Gaver et al. (1995), Holthausen et al. (1995), and Balsam et al. (2002) that found evidence of opportunistic earnings management.

Notably, earnings predictability (Tehran Stock Exchange), earnings relevance (Saudi Stock Exchange), earnings relevance among distressed firms (Tehran Stock Exchange), and earnings smoothness (Saudi Stock Exchange) significantly predict future profitability. These findings are consistent with Li et al. (2011) and Demerjian et al. (2013), though other earnings quality attributes diverge and align more closely with Wilson and Regent (2016) and Erden and Ornen (2017).

Overall, the results demonstrate a weak association between all three earnings quality attributes and future profitability.

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