Earnings Quality, Earnings Management and Financial Bankruptcy

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Abstract

This paper examined the relationship between earnings management and earnings quality for (93) companies from listed companies in Tehran Stock Exchange between 2007–2016, the total number of observations was 930, and the main research period is from 2011 to 2015. The data was collected as a firm-year and analyzed using multiple regression. The earnings quality was measured through seven distinct attributes: accruals quality, earnings persistence, earnings predictability, earnings smoothness, relevance of earnings, timeliness and conservatism of earnings). In order to achieve the research objectives, seven hypotheses were developed and in each hypothesis, the moderator role of one of the indicators of the earnings quality for each category of stressed and non-stressed firms was studied. The results indicated that in all cases of measuring the earnings quality, earnings management in stressed firms was opportunistic and in non-stressed firms was efficient. Furthermore, the earnings quality of predictability and relevance types only in non-stressed firms had a significant relationship with future profitability.

Keywords: Opportunistic earnings management, Efficient earnings management, Earnings quality, Financial stress, Financial bankruptcy.

Introduction:
Throughout the 1990s, when the U.S. Securities and Exchange Commission (SEC) changed the way it interact with managers and auditors, the focus on the earnings quality and earnings management increased. The SEC has accused managers of largely focused on opportunistic earnings management, and this is done to meet capital market expectations. Regarding that the stock market valuation of companies and the importance of their share-based compensation have changed overall, it has motivated managers to apply earnings management and to indicate high-quality of earnings (Dechow and Skinner, 2000).

The SEC has accused auditors of working with managers to mislead or deceive the users of financial reports. The SEC's critique of managers and auditors has led researchers to study how managers respond to the incentives arising from higher earnings, as well as issues related to the role of audit quality in earnings quality reports (Difond, 2010). Later, in early 2000, the biggest financial scandals in the history of the United States and Europe (e.g., Enron, WorldCom, Parmalat) were uncovered, meanwhile the literature on the earnings quality continued to grow. In order to restore investors' confidence, the emphasis was placed on the importance of the quality of financial reporting with a specific focus on earnings quality (Gaio & Raposo, 2011), and eventually these activities resulted in publication of the law (SOX) (Sarbanes-Oxley) in 2002. Recently, the development and practical implementation of a set of high-quality international accounting standards and the adoption of International Financial Reporting Standards (IFRS) has led to a focus on international accounting research and comparative studies of accounting practices among countries. Finally, in practical terms, the insertion of new electronic data made it easier to carry out studies on earnings quality using a large statistical sample, which was previously limited by costs of manual data collection (Marco & Futini, 2013).

Theoretical foundations:

**Theoretical background of earnings quality:**

Earnings quality theory originally proposed by financial analysts and stock brokers because they felt that reported earnings did not show how
profitable a company was, as it were in mind. Earnings quality is a multi-dimensional concept and there is no single definition of it. However, several researchers have provided definitions of earnings quality, which are summarized below. High quality earnings is that the accounting methods and estimates used to create it are free from bias (Lu, 2008). According to Lang and Yetman (2003), earnings quality is less earnings management and more timely recognition of losses (Foroughi & Mohammadi, 2011). Earnings quality is the earnings ability to meet the primary purpose of financial statements, which is the provision of useful information for investors, creditors and users, through which they can assess the outlook of a company’s cash flows (Phillips and Intasnel, 2003). Earnings quality is an important criterion in evaluating an entity’s financial health, which is considered by investors, creditors and other users of financial statements (Khajavi and Nazemi, 2005). There are seven qualitative attributes of earnings which are considered the most important criteria for assessing earnings quality, as presented by Francis et al. (2004). These criteria include: accrual quality, earnings persistence, earnings predictability, smoothness of earnings, relevance of earnings, timeliness of earnings, and earnings conservatism. In measuring the four attributes (accrual quality, earnings persistence, earnings predictability and smoothness of earnings) cash and earnings are considered as reference structures and consequently, are measured using accounting information only. Each of these features represents a different dimension of accounting information quality (Etemadi et al., 2012). The three attributes: relevance of earnings, timeliness of earnings, and earnings conservatism are market based information (profit and stock returns), which are another informational dimension of earnings, and are of particular interest to investors (Kurdistan and Majdi, 2007).

**Theoretical background of earnings management:**

Earnings management has several definitions that academics and professionals use, but up to date there is no an agreed definition about earnings management. For example, Schipper (1989) considers earnings management as “a purposeful intervention in the external financial reporting process, with the intent of obtaining the expected level of
profits”. (Levit, 1998) defines earnings management as a gray area where the accounting is being perverted; where managers are cutting corners; and, where earnings reports reflect the desires of management rather than the underlying financial performance of the company. According to Fields et al. (2001) and Siregar and Utama (2008), earnings management is classified into three categories: white earnings management, black earnings management, and colorless (gray) earnings management.

White earnings management takes advantage of flexibility in the choice of accounting treatments to signal the manager’s private information on future cash flows and this type of earnings management enhances the transparency of reports.

Black earnings management is the practice of using tricks to misrepresent and this type of earnings management reduces the financial reports transparency.

Colorless or gray earnings management includes manipulation of reports in the boundaries of compliance with bright-line standards, which could be either opportunistic or efficiency enhancing (Sajadi et al., 2012).

According to Subramanyam (1996) classification, the earnings management can be either efficient or opportunistic.

Efficient earnings management means improving the information content of the earnings to signal confidential information (Ibrahimi & Ibrahimi, 2012). In other words, increasing the quality of information provision to help users of financial reports in order to better understand the company's profitability and financial condition (Ahmad Pour, Montazeri, 2011).

Opportunistic earnings management is applied by managers through changing financial reports in order to mislead users and to maximize their own interests (Ibrahimi & Ibrahimi, 2012). Empirically, the existence of significant negative relationship or no significant relationship between discretionary accruals and future profitability indicates the opportunistic nature of earnings management. In efficient earnings management, discretionary accruals positively relate to future
profitability. In opportunistic earnings management, discretionary accruals negatively relate to future profitability (Feng Li et al., 2011).

**Theoretical background of financial stress and bankruptcy:**

Financial stress means reduction in company cash flows, and refers to a condition in which a company cannot meet, or has difficulty paying off, its financial obligations to its creditors. According to Whitaker (2004), financial stress is a situation in which corporate cash flows are less than the total interest expense associated with long-term debt (Jabouri, 2011).

Financial bankruptcy as defined by Altman (1968) happens when a company is unable to pay its debts; therefore, it is not able to continue its business activities. For Dun and Bradstreet (2002) bankrupt business entities are companies that stop their business operations due to the divestment or stopping of commercial operations or losses (Refaie, 2017). Joseph (2005) identified the difference between financial bankruptcy and financial distress in the use of financial flexibility criteria, so that financial distress would be subject to at least one of two criteria: (1) to reduce stock returns or to stop them; and (2) inability to pay the debts in due date, but the bankruptcy is subject to at least one of two conditions: (1) the inability to pay the debt in general; and (2) bankruptcy and liquidation of the company.

**Literature Review:**

Many researchers have found evidence that the impact of the earnings quality attributes on earnings management incentives and their relationship with future profitability in bankrupt and non-bankrupt is financial. Francis et al. (2008) also examine the relationship between the reputation of managers and earnings quality of companies and conclude that companies with well-known managers have low earnings quality in comparison with companies whose managers have a low reputation. Chang and Shiva (2010) evaluated the effect of earnings management on the prediction ability of the earnings. The results show that in the decile with the highest level of earnings management, not only the predictability of earnings will not be reduced, but also indicate the informative behavior of the earnings management. Ultimately, their research results do not strongly support opportunistic earnings
management. Sajadi et al. (2012), by examining the relationship between type of earnings management with the use of managerial powers in reporting the future profitability of companies listed at Tehran Stock Exchange, have found that there are positive significant relationship between discretionary accruals and future profitability. Tatli (2014) by examining the way of earnings management, efficient or opportunistic, has found that in the past few decades, accounting and bankruptcy scandals have been indicative of opportunistic behavior of managers, which lead to a reduction in investor’s confidence. These scandals have turned into a public outlook that earnings management cause disruption to companies. Information asymmetry between managers and owners of business entities causes earnings management due to conflict of interest. These problems make it necessary to study various types of earnings management from different aspects. Therefore, the purpose of this paper is to review the research on the opportunistic and efficient behavior of earnings management, incentives as well as the factors affecting it. Amin Nazemi et al., (2015) examined the effect of revised accounting standards on earnings management and earnings quality of listed companies at Tehran Stock Exchange. In this research, the criterion for measuring earnings management is the absolute value of discretionary accruals is the modified Jones model, and the accruals quality criterion of the modified Dechow and Dichow 2002 model has been used as a measure of earnings quality. To test the research hypotheses, 33 companies were surveyed from listed companies at Tehran Stock Exchange between 2006-2011. The research results indicate that in the years after the revision of accounting standards No. 16 and 20, earnings management increased and earnings quality did not change. Abbas zadeh and ArefiAsl (2015), while reviewing the concept of earnings quality and the classification of its measurement criteria, point out that there are different criteria for the earnings quality, and each of the researchers has examined a small number of them; they have used different models of measuring, but they did not achieved a single opinion on measurement methods to measure the quality of earnings. The results of this research show that although the concept of the earnings quality is clear, it is difficult to measure it in practice, it is not possible to provide a single and comprehensive definition of the
earnings quality, since individuals use reported earnings figures for different decisions. Hosseini et al., (2016) investigated the relationship between earnings management reward (incentive) and earnings response coefficient. Their research findings show that there is no relationship between earnings management incentive and earnings response coefficients. Furthermore, the results indicate a negative relationship between earnings management incentive and earnings response coefficient. Elkalla (2017) is an empirical investigation of earnings management in Middle East region. In this thesis, the specific parameters of each company across the country are examined for accruals-based earnings management of the Middle East and Africa (MENA region) companies. In addition, this study evaluates whether earnings management techniques are used as alternatives or complementary, or whether earnings management is either efficient or opportunistic. A cross-sectional regression was used to test a sample of 802 non-financial firms in the stock market (Bahrain, Egypt, Jordan, Kuwait, Morocco, Oman, Qatar, Saudi Arabia, Tunisia, and the United Arab Emirates) from 2014 to 1996. Regarding the accruals-based earnings management parameters, the results show that GDP growth, country-specific indicator variables, financial leverage, profitability, operational cycle and Altman Z-Score, and flexibility of earnings management positively relate with discretionary accruals, while the size of the company has a negative relationship with discretionary accruals, growth opportunity, distribution ratio of dividends and tangible assets. In addition, industry membership appears to affect discretionary accruals. Taking into account the efficient earnings management model as opposed to opportunistic earnings management, evidence suggests that earnings management in the Middle East and North Africa is more opportunistic and it is not efficient.

**Research hypotheses:**

There are two types of earnings management: efficient and opportunistic. Earnings management is efficient if managers use their discretion to communicate private information about firm profitability, which is yet to be reflected in the historical cost-based earnings; it is opportunistic if managers use their discretion to maximize their personal utility rather than communicating private information about firm
profitability (Subramanyam, 1996) The earnings quality has a close relationship with earnings management in evaluating the financial situation. Thus, earnings management has much in common with earnings quality (Lo, 2008). Earnings management directly affects the overall integrity of financial reporting and significantly affects the allocation of resources in companies (Healy & Wahlen, 1999, Dichow et al., 1995). Siregar and Utama (2008) measure earnings management as discretionary accrual; they calculate discretionary accrual as the residuals, from the company-specific expectations model provided by Jones (1991). Subramanyam (1996) demonstrates that discretionary accruals have the ability to signal levels of future profitability, after controlling current levels of operating cash flows and non-discretionary accruals. Therefore, the authors examine in this paper whether or not the discretionary accruals have an effect on future profitability, and this is done by identifying an efficient or opportunistic earnings management among the two types of Tehran Stock Exchange companies (stressed and non-stressed). If earnings management is efficient, then discretionary accruals have a significant positive relationship with future profitability. If it is opportunistic, then discretionary accruals have a significant negative relationship or insignificant relationship with future profitability. The financial statements of near-bankrupt firms are more likely to reflect evidence of material overstated earnings than those of non-bankrupt firms (since such firms are presumably motivated by a desire to conceal signs of distress). By reviewing the literature review on the earnings quality and the type of earnings management, it is clear that the researchers are trying to find out what motives are used by managers to manage earnings and how their incentives for manipulating the earnings affect the earnings quality? The findings of some external and internal investigations show that the incentives for manipulation and earnings management in financially stressed companies are more than non-stressed ones.

We assume that stressed firms are more likely to manipulate earnings than non-stressed firms.

In summary, the seven hypotheses lead to different predictions between the earnings management and earnings quality.
1: Earnings quality based on accruals quality indicates that earnings management is opportunistic for stressed firms and efficient for non-stressed firms.

2: Earnings quality based on persistence indicates that earnings management is opportunistic for stressed firms and efficient for non-stressed firms.

3: Earnings quality based on predictability indicates that earnings management is opportunistic for stressed firms and efficient for non-stressed firms.

4: Earnings quality based on smoothness indicates that earnings management is opportunistic for stressed firms and efficient non-stressed firms.

5: Earnings quality based on relevance indicates that earnings management is opportunistic for stressed firms and efficient non-stressed firms.

6: Earnings quality based on timeliness indicates that earnings management is opportunistic for stressed firms and efficient non-stressed firms.

7: Earnings quality based on conservatism indicates that earnings management is opportunistic for stressed firms and efficient non-stressed firms.

**Statistical sample (n):**

The population of this reason for this choice can access the company's financial information and they are more homogeneous because of Tehran stock exchange's regulations and standards, the study of Tehran Stock Exchange, was divided into two categories of financially distressed and non-stressed based on Ohlson model. The study period is based on the variables of four years, the current year, and the coming years, 2007 to 2016, and the main study period is from 2011 to 2015. The statistical sample of this research is selected based on the criteria and conditions of the study population. These criteria and conditions are:

1-Considering the time realm, and considering that for calculating some parameters such as future profitability and future earnings, the data from
2007 to 2016 are required, we choose companies which accepted in Tehran Stock Exchange from 2007 to 2016 and are active

2-Their financial period ended at the end of solar year and their financial statements were audited.

3-During this period, there is no change in the fiscal year and all information is available.

4-The company is not financial intermediary companies such as banks and investment companies and insurance and service companies.

5-Finally, according to the mentioned criteria, 93 companies from Tehran Stock Exchange were selected as the statistical sample for this research.

Research Methodology:

In this section, the research methodology is fully presented. In order to test the research hypotheses, the companies in the research sample based on the Ohlson model are first categorized into two non-stressed and distressed groups.

The model is as follows:

\[ O_i = -1.32 - 0.407 \times X_1 + 6.03 \times X_2 - 1.43 \times X_3 + 0.0757 \times X_4 - 2.37 \times X_5 - 1.83 \times X_6 + 0.285 \times X_7 - 1.72 \times X_8 - 0.521 \times X_9 \]

where:

- \( O_i \) = relative index to calculate the probability function
- \( X_1 \) = logarithm of total assets / GNP index, (Rial Index of Gross National Production)
- \( X_2 \) = total liabilities / total assets ratio
- \( X_3 \) = working capital / total assets ratio
- \( X_4 \) = current liabilities ratio / current assets
- \( X_5 \) = virtual variable assigned a value of 1 if the total liabilities is greater than or equal to the total assets otherwise assigned as 0.
- \( X_6 \) = net profit / total assets
- \( X_7 \) = funds from operations / total debt
- \( X_8 \) = Virtual variable assigned a value of 1 if it is negative for the past two years otherwise assigned as 0.
- \( X_9 \) = change rate in net profit compared to previous year as: \( \frac{(NIT - NIT_{-1})}{(|NIT|+|NIT_{-1}|)} \) = Change in net profit, based on logit analysis, put the amount obtained for each item in the \( P(O) = \frac{1}{1 + e^{-O}} \)
equation and the conditional probability of bankruptcy is calculated. If P(O) is less than 0.5, the firm will be bankrupt, and if P(O) is more than 0.5, the firm will be classified as non-stressed and the critical point here will be 50% P(O). Was. (Dechow, 1998), (MoghadamAbolfazl and Farzaneh, Nasirzadeh, 2009) and (Timermans, 2014).

**Measuring variables:**

1. **Independent variable:** In this research, there are two independent variables (earnings quality and earnings management)

   a. The earnings quality: the earnings quality has seven attributes including (accruals quality, earnings persistence, earnings predictability, earnings smoothness, relevance of earnings, timeliness of earnings, and earnings conservatism).

   - Accruals quality based on the Dechow and Dichow (2002) model is given by:

   **Model (1):**

   \[
   \frac{TCA_{j,t}}{TotalAsset_{j,t-1}} = b_0 + b_1 \cdot \frac{CFO_{j,t-1}}{TotalAsset_{j,t-1}} + b_2 \cdot \frac{CFO_{j,t}}{TotalAsset_{j,t-1}} + b_3 \cdot \frac{CFO_{j,t+1}}{TotalAsset_{j,t-1}} + \varepsilon_{j,t}
   \]

   Where:

   TCA j, Firm j’s total current accruals in t; Total Asset j, t-1. Firm j’s total assets in year t-1; CFO j, t Firm j’s cash flow from operations in year t; Earn j, t Firm j’s operating profit in year t, is equivalent to revenues minus operating expenses from the main and current activities of the business entity.

   TCA j, t measured as follows: **Equation (1):**

   \[
   TCA_{j,t} = Earn - CFO
   \]

   Accruals quality (AQ) is obtained from standard deviation of the estimated residuals of model (1) as follows: **Equation (2):**

   \[
   Accruals\ Quality\ j,\ t = \sigma (\varepsilon^*_{j,t})
   \]
Large (small) values of AccrualsQuality correspond to lower (higher) accruals quality and lower (higher) earnings quality.

-Earnings persistence in this study based on Kormendi and Lipe model (1987) is measured as following:

Model (2):

\[
\frac{\text{Earn}_{j,t}}{\text{TotalAssets}_{j,t-1}} = \alpha + \delta_1 \frac{\text{Earn}_{j,t-1}}{\text{TotalAssets}_{j,t-1}} + \nu_{j,t}
\]

Where:

Earn j, t  Firm’s j operating profit in year t; Earn j, t−1Firm’s j operating profit in year t-1; Total Asset j, t-1Firm’s j total assets in year t-1

If the coefficient of the explanatory variable of the earnings persistence model (δ1) is close to one or greater than one indicates highly persistent earnings while values close to zero or smaller than zero implies transitory earnings.

-Earnings predictability is calculated using the square root of the error variance from the equation of earnings persistence model (2) as following:

Equation (3):

\[
\text{predictability}_{j,t} = \sqrt{\sigma^2 (\nu_{j,t})}
\]

Large (small) values of predictability imply less (more) predictable earnings. More predictable earnings are viewed as higher quality, while less predictable earnings are viewed as lower quality.

-Earnings smoothness Francis et al. (2004) measure earnings smoothness as the ratio of standard deviation of net income before extraordinary items divided by the total assets at beginning of year, to the standard deviation of cash flow from operations divided by total assets at beginning of year. model (2).
Where:

\( \text{Earn}_{j,t} = \text{Firm j's net income before extraordinary items in year } t, \)

\( \text{CFO}_{j,t} = \text{Firm j's operating cash flows in year } t \) (indirect approach),

\( \sigma = \text{Firm j's standard deviation} \)

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

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

:(3) Model

\[
\text{RET}_{j,t} = \delta_{0,j} + \delta_{1,j} \text{EARN}_{j,t} + \delta_{2,j} \Delta \text{EARN}_{j,t} + \varepsilon_{j,t}
\]

\( \text{RET}_{j,t} \) = firm j’s returns in t year, \( \text{EARN}_{j,t} \) = firm j’s earnings in year t before the exceptional items (unpredictable), \( \Delta \text{EARN}_{j,t} \) = Change in earnings before the exceptional items (unpredictable) (NIBE), \( \varepsilon_{j,t} \) = firm’s J compared to previous year

-Timeliness of earnings: To estimate the timeliness of earnings, the Basu (1997) model used (Francis et al., 2004) as:

:(4) model

\[
\text{EARN}_{j,t} = \alpha_{0,j} + \alpha_{1,j} \text{NEG}_{j,t} + B_{1,j} \text{RET} + B_{2,j} \text{NEG}_{j,t} \cdot \text{RET} + S_{jt}
\]

\( \text{NEG}_{j,t} \) = The negative return indicator is 1 if \( \text{RET} < 0 \), otherwise it will be 0.

-Earnings conservatism: is based on estimations of timeliness model equivalent to positive stock return coefficient ratio and calculated as (Francis et al., 2004):

Equation (3):

\[
\text{Conservatism} = -(B_{1,j} + B_{2,j})/B_{1,j}
\]

In this model, conservatism can be distinguished between positive stock returns (economic earnings) and negative stock returns (economic
losses). Higher (lower) values obtained indicates higher (lower) earnings conservatism.

B1,J= positive stock returns coefficient (economic profit or good news).
B2,J= negative stock returns coefficient (economic loss or bad news).

**B-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. Model (5) and equations (4) and (5) and (6) express this point (Fing Li et al., 2011), (Noravesh&Hosseini, 2009) and (Etemadi et al., 2012).

Model(5):

\[
TA_{j,t} / A_{j,t-1} = \alpha_1 (1 / A_{j,t-1}) + \alpha_2 (\Delta REV_{j,t} - \Delta REC_{j,t} / A_{j,t-1}) + \alpha_3 (PPE_{j,t} / A_{j,t-1}) + \epsilon_{j,t}
\]

TA\_j,t = total accruals calculated as follows:

Equation (4):

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

After estimating the parameters \(\alpha_1, \alpha_2, \alpha_3\) of model (5), the equations (5) and (6) were used to determine the non-discretionary and discretionary accruals.

Equation (5):

\[
NDA_{j,t} = \alpha_1 (1 / A_{j,t-1}) + \alpha_2 (\Delta REV_{j,t} - \Delta REC_{j,t} / A_{j,t-1}) + \alpha_3 (PPE_{j,t} / A_{j,t-1})
\]

Equation (6):

\[
DA_{j,t} = TA_{j,t} / A_{j,t-1} - NDA_{j,t}
\]

Where:

\(TA_{j,t}\) = firms’ j total accruals in year t , \(\Delta CA_{j,t}\) = firms’ j changes in current assets in year t compared to year t-1 , \(\Delta CL_{j,t}\) = firms’ j changes in current debts in year t compared to year t-1 , \(\Delta Cash_{j,t}\) = firms’ j changes in cash in year t compared to year t-1 , \(A_{j,t-1}\) = firms’ j total assets at the beginning of the period , \(\Delta REC_{j,t}\) = Changes in accounts and
receivables + other accounts receivable of firm j in year t compared to year t-1,

$\Delta \text{REV}_{j, t} = \text{firms' j corporate revenue changes in year t compared to year t-1}$

$\text{PPE}_{j, t} = \text{firms’ j gross property, Plant and equipment in year t}$

$\text{NDA}_{j, t} = \text{firms’ j discretionary accruals in year t}$

$\text{DA}_{j, t} = \text{firms’ j non-discretionary accruals in year t}$

$\Delta \text{STD}_{j, t} = \text{firms’ j change in portion of short-term debt of long-term debt in year t compared to year t-1}$

$\text{DEP}_{j, t} = \text{firms’ j depreciation expense in year t}$

2. Dependent variable: in this research, future profitability is a dependent variable.

$X_{j, t+1}$ Future Profitability in Model (7) below, measured with the following variable:

$\text{NDNI}_{j, t+1} = \text{Future non-discretionary net profit (CFO}_{j, t+1} + \text{NDA}_{j, t+1})$

**Research model:** the variables of earnings quality and accounting variables are measured for two sample groups in Tehran Stock Exchange. Therefore, in this section, we apply regression analyses to test the five hypotheses by employing using the following model (6):

model (7):

$$X_{j, t+1} = b_0 + b_1 \text{DA}_{j, t} + b_2 \text{NDA}_{j, t} + b_3 \text{CFO}_{j, t} + b_4 \text{Attribute}_{K, j, t} + \epsilon_{j, t}$$

Attribute $K_{j, t} = \text{the decile rank is related to earnings quality. In order to eliminate the effects of the scale of variables and increase the comparability, for the direct use of earnings quality variable, its rank has been used. The rank is meant to be the decile where the relevant observation is located.}$

$K = \text{each of the qualitative features of earnings (accruals quality, earnings smoothness relevance earnings, timeliness of earnings, earnings conservatism).}$

To determine the efficient or opportunistic earnings management (accepting or not accepting hypotheses), the coefficient discretionary
accruals and its level of significance are used. If coefficient discretionary accruals (b1) in model(6) is positive and significance level of 0.05, the coefficient of test (t) is more than 1.96, type of earnings management is efficient. If the coefficient discretionary accruals (b1) is less than or equal to 0 or minor positive or insignificant and the coefficient of test (t) is less than 1.96 the earnings management is opportunistic (Siregar & Utama, 2008, quoted by Feng Li et al. 2011). Furthermore, the validity of estimated regression models is examined based on F and R² statistics and the effect of each independent variable on dependent variables through sample statistic (t) and probability values is also studied. To examine the effect of qualitative characteristics of earnings on the type of earnings management, through the coefficient of variance related to the positive earnings quality and value for sample statistic (t) is greater than 1.96, it means significant.

**Article findings:**

Test results of the 1st hypothesis

Table 1. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.005</td>
<td>0.132</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.382</td>
<td>1.925</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.416</td>
<td>2.829</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.653</td>
<td>3.825</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.006</td>
<td>1.104</td>
</tr>
<tr>
<td>AdjustedR2</td>
<td>0.311</td>
<td>0.243</td>
</tr>
<tr>
<td>F statistic(significance)</td>
<td>4.620</td>
<td>0.004</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.264</td>
<td></td>
</tr>
</tbody>
</table>
-According to table 1, the F-statistic for the model with dependent variable of future non-discretionary net profit is less than 0.05 in both stressed and non-stressed firms, therefore it is significant. It can be said that in stressed and non-stressed firms, the earnings management and earnings quality based on accruals quality have significant relationship with the future profitability.

- The Durbin-Watson statistics for all models are between 1.5 and 2.5 and close to 2, indicates that there is no first-order correlations among the residuals.

- The adjusted $R^2$ and $R^2$ statistics for the stressed firms are 0.243, indicating that about 24% of the dependent variable variations is explainable by the independent variable. However, the adjusted $R^2$ statistic of the model in non-stressed firms' data is also 0.522, which indicates that about 52% of the dependent variable variations explainable by the independent variable.

- The variable coefficient for discretionary accruals for the stressed firms' data is 0.382 and positive. The t-statistic is 1.925. Since this statistic is less than 1.96, the coefficient is not significant which indicates that earnings management in the stressed firms is opportunistic, while the variable coefficient for discretionary accruals for the non-stressed firms' data is 0.233, also positive, and the related t-statistic is 4.731 and more than 1.96, it can be noticed that this relationship is significant and indicates that the earnings management in non-stressed firms is efficient.

- Furthermore, the variable coefficient of earnings quality based on the accruals quality in stressed firms has a value of 0.006 and the t-statistic is 1.104, while the t-statistic of earning quality variable based on accruals quality in non-stressed firms is 0.449. Both t-statistics are less than 1.96, indicating that the relationship between this variable and the future profitability in the stressed and non-stressed firms is not significant.

- Accordingly, it can be said that earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings quality in stressed and non-stressed firms cannot explain future profitability.
**Test results of the 2nd hypothesis**

Table 2. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.025</td>
<td>0.556</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.330</td>
<td>1.355</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.401</td>
<td>2.545</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.590</td>
<td>3.276</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.006</td>
<td>0.464</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.294</td>
<td>0.225</td>
</tr>
<tr>
<td>F statistic(significance)</td>
<td>4.267</td>
<td>0.006</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.196</td>
<td>1.907</td>
</tr>
</tbody>
</table>

- According to the table 2, the F-statistic for the model with the dependent variable of the future non-discretionary net profit in the stressed firms is more than 0.05 and therefore is not significant, and it can be said that in stressed firms, earnings management and earnings quality based on earnings persistence have no significant relationship with future profitability. The F-statistic in non-stressed firms is less than 0.05 and therefore significant and it can be said that in non-stressed firms, earnings management and earnings quality based on earnings persistence have a significant relationship with future profitability.

- The Durbin-Watson statistics for stressed and non-stressed firms are between 1.5 and 2.5 and close to 2, which indicates that there is no first-order correlations among the residuals.

- The adjusted $R^2$ and $R^2$ statistics of the model for the stressed and non-stressed firms’ data are 0.225, indicating that about 23% of the dependent variable variations is explainable by the independent variable. However, the adjusted $R^2$ and $R^2$ statistics of the model for the non-stressed firms’
data are 0.525, indicating that about 53% of the dependent variable variations explainable by the independent variable.

-The variable coefficient for discretionary accruals for stressed firms’ data is 0.330. The t-statistic is 1.355. Since this statistic is less than 1.96, it is not significant which indicates that the earnings management in the stressed firms is opportunistic, while the variable coefficient of discretionary accruals for non-stressed firms’ data is 0.209, and positive and the t-statistic is 4.701, more than 1.96. It can be noticed that this relationship is significant and indicates that the earnings management in non-stressed firms is efficient.

-Furthermore, the variable coefficient for earnings quality based on earnings persistence in stressed firms is 0.006 and t-statistic is 0.464, while the t-statistic for earnings quality variable based on earnings persistence in non-stressed firms is 1.621 and the both t-statistics are less than 1.96, which indicates that the relationship between this variable and the future profitability in stressed and non-stressed firms is not significant.

-Accordingly, it can be said that the earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings quality in stressed and non-stressed firms cannot explain the future profitability.

**Test results of the 3rd hypothesis**

Table 3. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.044</td>
<td>0.938</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.394</td>
<td>1.957</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.425</td>
<td>2.709</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.618</td>
<td>3.502</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.000</td>
<td>0.001-</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.290</td>
<td>0.221</td>
</tr>
</tbody>
</table>
According to the table 3, the F-statistic for the model with the dependent variable of future non-discretionary net profit, in the stressed firms is more than 0.05 and therefore not significant and it can be said that in stressed firms, earnings management and earnings quality based on the earnings predictability have not significant relationship with future profitability criteria, but in non-stressed firms it is less than 0.05 and therefore significant and it can be said that in non-stressed firms, earnings management and earnings quality based on the earnings predictability have significant relationship with future profitability criterion.

The Durbin-Watson statistic in stressed and non-stressed firms are between 1.5 and 2.5 and close to 2, which indicates that there is no first-order correlations among the residuals.

The adjusted $R^2$ and $R^2$ statistics for the stressed firms’ data are 0.221, indicating that about 22% of the dependent variable variations is explainable by the independent variable. However, the adjusted $R^2$ and $R^2$ statistics for the non-stressed firms’ data are also 0.527, indicating that about 53% of the dependent variable variations is explainable by the independent variable.

The variable coefficient for discretionary accruals for stressed firms’ data is 0.394. The t-statistic is 1.957. Since this statistic is less than 1.96, the coefficient is not significant, indicating that the earnings management in the stressed firms is opportunistic, while variable coefficient for discretionary accruals in non-stressed firms’ data is 0.209, and positive, the related t-statistic is 4.093, it is more than 1.96, it can be noticed that this relationship is significant which indicates that earnings management in non-stressed firms is efficient.

Furthermore, the variable coefficient for earnings quality in stressed firms is zero and absolute value of t-statistic is 0.001, less than 1.96, which indicates that the relationship between this variable and future profitability in stressed firms is not significant, while the t-statistic for earnings quality in non-stressed firms is 2.074, more than 1.96, indicating
that the relationship between this variable and the future profitability in stressed and non-stressed firms is significant.

- Accordingly, it can be said that earnings management in stressed firms is opportunistic firms and in non-stressed firms is efficient, and the earnings quality in stressed firms cannot explain future profitability, but in non-stressed firms can explain future profitability.

Test results of the 4th hypothesis

Table 4. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.029</td>
<td>0.959</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.388</td>
<td>1.916</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.416</td>
<td>2.632</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.581</td>
<td>3.195</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.003</td>
<td>0.621</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.299</td>
<td>0.229</td>
</tr>
<tr>
<td>F statistic(significance)</td>
<td>4.269</td>
<td>0.006</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.242</td>
<td></td>
</tr>
</tbody>
</table>

- According to the table 4, the F-statistic for the model with the dependent variable of the future non-discretionary net profit in the stressed firms is more than 0.05 and therefore not significant, and it can be said that in stressed firms, earnings management and earnings quality based on earnings smoothness have not significant relationship with future profitability, but non-stressed firms it is less than 0.05 and therefore significant and it can be said that in non-stressed firms, earnings management and earnings quality based on earnings smoothness have significant relationship with future profitability.

- The Durbin-Watson statistics in stressed and non-stressed firms are between 1.5 and 2.5 and close to 2, which indicates that there is no first-order correlations among the residuals.
The adjusted $R^2$ and $R^2$ statistics for the stressed firms’ data are 0.229, indicating that about 23% of the dependent variable variation is explainable by the independent variable. However, the adjusted $R^2$ and $R^2$ statistics of the non-stressed firms’ data are 0.523, which indicates that about 52% of the dependent variable variations is explainable by the independent variable.

The variable coefficient for discretionary accruals for the stressed firms’ data is 0.388, and positive. The $t$-statistic is 1.916. Since this statistic is less than 1.96, coefficient is not significant, indicating that earnings management in the stressed firms is opportunistic, while the variable coefficient for discretionary accruals for the non-stressed firms’ data is 0.247 and positive. The related $t$-statistic is 4.983, more than 1.96, it can be noticed that this relationship is significant which indicates that the earnings management in non-stressed firms is efficient.

Furthermore, the variable coefficient for earnings quality based on earnings smoothness in stressed firms is 0.003. The $t$-statistic is 0.621, while the $t$-statistic for earnings quality based on earnings smoothness in non-stressed firms is 1.313 and the both $t$-statistics are less than 1.96, indicating that the relationship between this variable and the future profitability in stressed and non-stressed firms is not significant.

Accordingly, it can be said that earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings quality in the both stressed and non-stressed firms cannot explain future profitability.

**Test results of the 5th hypothesis**

Table 5. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI $j, t+1$</td>
<td>NDNI $j, t+1$</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>$t$-statistic</td>
</tr>
<tr>
<td>$b_0$</td>
<td>0.003</td>
<td>0.081</td>
</tr>
<tr>
<td>DA $j, t$</td>
<td>0.363</td>
<td>1.672</td>
</tr>
<tr>
<td>NDA $j, t$</td>
<td>0.445</td>
<td>2.837</td>
</tr>
<tr>
<td>CFO $j, t$</td>
<td>0.607</td>
<td>3.419</td>
</tr>
</tbody>
</table>
According to the table 5, the F-statistic for the model with dependent variable of future non-discretionary net profit in stressed and non-stressed firms are less than 0.05 and therefore it is significant, and it can be said that stressed and non-stressed firms, earnings management and earnings quality based on relevance of earnings have a significant relationship with future profitability.

The Durbin-Watson statistics for all models are between 1.5 and 2.5 and close to 2, which indicate that there is no first-order correlations among the residuals.

The adjusted R2 and R2 of the model in the stressed firms’ data are 0.265, indicating that about 27% of the dependent variable variations is explainable by the independent variable. However, the adjusted R2 statistic of the model in the non-stressed firms’ data are 0.532, indicating that about 53% of the dependent variable variations is explainable by the independent variable.

The variable coefficient for discretionary accruals for the stressed firms’ data is 0.363 and positive. The t-statistic is 1.672. Since this statistic is less than 1.96, the coefficient is not significant, indicating that the earnings management in stressed firms is opportunistic, while the variable coefficient for discretionary accruals for the non-stressed firms is 0.244. The t-statistic for that is 5.002 and more than 1.96, it can be noticed that this relationship is significant which indicates that earnings management in non-stressed firms is efficient.

Furthermore, the variable coefficient for earnings quality based on relevance of earnings in stressed firms is 0.009. The t-statistic is 1.455 and less than 1.96, which indicates that the relationship between this variable and future profitability is not significant. However, the t-statistic for earnings quality based on relevance of earnings in non-stressed firms is 2.766 and more than 1.96, indicating that the
relationship between this variable and the future profitability stressed and non-stressed firms is significant.

Accordingly, it can be said that earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings quality in stressed firms cannot explain future profitability, but in non-stressed firms, it can explain future profitability.

**Test results of the 6th hypothesis**

Table 6. The results of estimations of the research model on the data of stressed and non-stressed firm

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.012−</td>
<td>0.308−</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.321</td>
<td>1.312</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.422</td>
<td>2.662</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.633</td>
<td>3.287</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.009</td>
<td>1.270</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.386</td>
<td>0.309</td>
</tr>
<tr>
<td>F statistic(significance)</td>
<td>5.028</td>
<td>0.003</td>
</tr>
<tr>
<td>Durbin-Watson</td>
<td>2.705</td>
<td>1.667</td>
</tr>
</tbody>
</table>

According to the table 6, the F-statistic for the model with dependent variable of future non-discretionary net profit in stressed and non-stressed firms are less than 0.05 and therefore it is significant, and it can be said that in stressed and non-stressed firms, earnings management and earnings quality based on earnings timeliness have a significant relationship with future profitability.

The Durbin-Watson statistics for all models are between 1.5 and 2.5 and close to 2, which indicate that there is no first-order correlations among the residuals.

The adjusted R2 and R2 statistics for the stressed firms are 0.309, indicating that about 31% of the dependent variable variation is explainable by the independent variable. However, the adjusted R2
statistic of the model for non-stressed firms’ data is 0.483, indicating that about 48% of the dependent variable variations is explainable by the independent variable.

-The variable coefficient for discretionary accruals in the stressed firms’ data is 0.321, and positive. The t-statistic is 1.312. Since this statistic is less than 1.96, the coefficient is not significant, indicating that the earnings management in the stressed firms is opportunistic, while the variable coefficient for discretionary accruals in the stressed firms’ data is 0.221 and also positive. The related t-statistic is 5.206 and more than 1.96, it can be noticed that this relationship is significant and indicates that the earnings management in non-stressed firms is efficient.

-Furthermore, the variable coefficient for earnings quality based on earnings timeliness in stressed firms is 0.009. The t-statistic is 1.270, while the t-statistic for earnings quality based on earnings timeliness in non-stressed firms is 1.576 and the both t-statistics are less than 1.96, this indicates that the relationship between this variable and future profitability in the stressed and non-stressed firms is not significant.

-Accordingly, it can be said that earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings quality in the both stressed and non-stressed firms cannot explain the future profitability.

**Test results of the 7th hypothesis**

Table 7. The results of estimations of the research model on the data of stressed and non-stressed firms

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data of stressed firms</th>
<th>Data of non-stressed firms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NDNI j, t+1</td>
<td>NDNI j, t+1</td>
</tr>
<tr>
<td></td>
<td>Coefficient</td>
<td>The t-statistic</td>
</tr>
<tr>
<td>b0</td>
<td>0.013</td>
<td>0.253</td>
</tr>
<tr>
<td>DA j, t</td>
<td>0.213</td>
<td>0.806</td>
</tr>
<tr>
<td>NDA j, t</td>
<td>0.456</td>
<td>2.381</td>
</tr>
<tr>
<td>CFO j, t</td>
<td>0.617</td>
<td>3.215</td>
</tr>
<tr>
<td>Attribute K j, t</td>
<td>0.003</td>
<td>0.294</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>0.295</td>
<td>0.197</td>
</tr>
</tbody>
</table>
-According to the table 7, the F- statistic for the model with dependent variable of future non-discretionary net profit in stressed and non-stressed firms are less than 0.05 and therefore it is significant, and it can be said that in stressed and non-stressed firms, earnings management and earnings quality based on earnings conservatism have a significant relationship with future profitability.

- The Durbin-Watson statistics for all models are between 1.5 and 2.5 and close to 2, which indicate that there is no first-order correlations among the residuals.

- The adjusted R2 and R2 statistics for the stressed firms are 0.197, indicating that about 20% of the dependent variable variations is explainable by the independent variable. However, the adjusted R2 statistic of the model in non-stressed firms’ data is a 0.501, which indicates that about 50% of the dependent variable variations is explainable by the independent variable.

- The variable coefficient for discretionary accruals in the stressed firms’ data is 0.213 and positive. The t -statistic is 0.806. Since this statistic is less than 1.96, the coefficient it not significant, indicating that the earnings management in the stressed firms is opportunistic, while the variable coefficient for discretionary accruals in the non-stressed firms’ data is 0.222, and positive. The related t -statistic is 4.047 and more than 1.96, it can be noticed that this relationship is significant which indicates that earnings management in non-stressed firms is efficient.

- Furthermore, the variable coefficient for earnings quality based on earnings conservatism in stressed firms is 0.003. The t -statistic is 0.294, while the t-statistic for earnings quality based on earnings conservatism in non-stressed firms is 0.318 and both t-statistics are less than 1.96, this indicates that the relationship between this variable and the future profitability in stressed and non-stressed firms is not significant.

- Accordingly, it can be said that earnings management in stressed firms is opportunistic and in non-stressed firms is efficient, and the earnings
quality in the both stressed and non-stressed firms cannot explain the future profitability.

**Summary and Conclusion:**

In this research, we measured seven attributes of earnings quality, earnings management and their relation with future profitability variable in both stressed and non-stressed firms in order to clarify whether there is a statistically significant relationship between earnings quality and future profitability in stressed and non-stressed firms. The findings of this paper show that companies in stock exchange manage their earnings. This is consistent with the results of those of previous studies such as Etemadi et al., (2012) and Sajadi et al., (2012). These findings are consistent also with much of the external investigation. The results of Li et al. (2011) and Garcia Lara et al. (2009) showed that bankrupt firms managed their earnings in an incremental way four years ago, which resulted in a reduction in the reliability of accounting profitability.

Despite the importance of various earnings attributes from the perspective of investors, regarding the impact of earnings the results of the investigations like Li et al. (2011) show a weak relationship between each of the four variables of earnings quality with future profitability. Therefore, it can be said that earnings management has been used more than earnings quality in predicting future profitability.

The results indicate that in all cases of measuring the earnings quality, earnings management in stressed firms is opportunistic and in non-stressed firms is efficient. Furthermore, the earnings quality of predictability and relevance types only in non-stressed firms has a significant relationship with future profitability.

**References**

4- Dechow M.P & Sloan R.G. & Sweeney A.P.,(1995)“detecting earnings management, the accounting review,70(2) USA, p193-225.
27- Nasirzadeh, Farzaneh; Abu al-Fazl Moghaddam; Mohammad Gholampour (2009) "Investigating the ability of bankruptcy prediction models of Altman and Ohlson to predict the bankruptcy of listed companies in the stock market", Scientific & Research) Year 16, Number 28, Autumn 2009, pp. 194-220
31- Sajadi, Sayyid Hossein; Mohsen Dastgir; Ali Hossein Hosseinzadeh; Mohammad Omid Akhgar (2012) "Studying the ways of using management authority in future profitability reporting and the impact of corporate characteristics on the use of these authorities", Journal of Accounting Knowledge, Year 3, Issue 8, pp. 7-30.
35- Tatil Rashid (1392) "Examining the qualitative characteristics of earnings and the type of earnings management in stressed and bankrupt firms", Azad University of Qazvin, pp. 2-12.