Relationship between Earnings Quality and Stock Returns in Tehran Stock Exchange

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Abstract

Current work aims at investigating effect of earnings quality on stock return. Five criteria were considered for earnings quality measurement. Then effect of the criteria on stock return was studied separately. Statistical population included 68 companies listed in Tehran Stock Exchange. Regression, correlation coefficient and Kolmogorov – Smirnov methods were used for testing hypotheses. Findings indicated there is positive relationship between earnings quality and stock return and relationship between earnings quality measurement criteria with stock return was as follows (from strong to weak): 1. Third criterion (stability of reported earnings), 2. First criterion (relationship between operating cash flow to operating profit), 3. Second criterion (potential expected profit), 4. fourth criterion (total liabilities), 5. Fifth criterion (quality of working capital accruals).

Keywords: Earnings Quality, Accruals Quality, Stock Return
Introduction

Accounting profit is one of most basic elements of financial statements which have always been considered; however, using conservatism limitations and importance of determining accounting profit cause some analysts to concluded that economic income is better index compared to accounting profit (Schipper and Vincent, 2003).

The possibility to use various accounting methods by the companies cause that the actual profit is different from the accounting profit reported in financial statements, and since accruals constitute an important part of it, quality of accruals have been considered by the scholars in accounting and investment management field. Financial analysts evaluate accruals quality in order to determine appropriate level of profit, predicting future profit and specifying company's stock price. Stakeholders and investors should consider quality and quantity of the profit in determining the company's value. Accounting based signs provide additional information which can show illogical elements of stock price (Frankel and Lee, 1998).

Five earnings quality measurement criteria are used in this work. The first criterion is earnings quality based on relationship between operating cash flow and operating profit. Second criterion is earnings quality based on profit prediction capability. Third criterion is stability of reported earnings. Fourth criterion is measurement of total liabilities and fifth criterion is measurement of quality of working capital accruals (Dechow and Dichev, 2002).

Now the question is: is reported net profit, which is influenced by methods and estimates of accounting accruals, able to evaluate performance and accountability and show the company's profitability capacity? Does the market pay attention to accruals quality? If so, does stock return with accruals quality show this? Do investors pay attention to quality of accounting information in addition to their quantity? Which criterion of earnings quality evaluation is more considered by investors and financial analysts?

In order to find answer for these questions, studying relationship between earnings quality and stock return seems necessary.

Review of Literature

Earnings quality is a concept related to earnings management, but it is does not mean exactly the same. Earnings quality and earnings management concepts have not been well defined and it is their common feature. Earnings management may influence earnings quality (Teets, 2002). Earnings quality evaluation helps users of financial statements so that they can judge reliability of current and predict the future (Deloitte and Touche, 2004). High earnings quality brings in following advantages (Ricol, 2004):
1. Financial statements reflect actual performance of the business unit and high quality financial information shows actual value of the business unit to the investors.

2. Capital market is developed, since if the society is not sure about financial reporting process, it will avoid investments and thus, capital market development and growth will be slowed down.

3. Economic growth will be increased, because high earnings quality leads to increased financial information reliability and financial information reliability is directly related to economic development.

Past earnings may estimate future earnings. Lipe considered a criterion for prediction through calculation of earnings changes variance and expressed the higher is variance, predictability is reduced (Lipe, 1990). Francis et al. used square root of estimated variance error of earnings stability equation for investigating earnings predictability. According to them, the higher square root is, the earnings quality is higher and it is good index for predicting future earnings (Francis et al., 2000). Palepu et al. believe estimation error is one of the main factors which reduce accounting information quality. Estimation error depends on characteristics of the company such as complexity of transactions and environment predictability (Palepu et al., 2000).

Dechow et al. used quality of working capital accruals to investigate earnings quality and stated the higher is accruals quality, earnings quality is higher (Dechow and Dichev, 2002; Balsam et al., 2003). Scholar studied earnings quality through quality of working capital accruals and used the method introduced by Dechow and Dichev (2000) and supported their findings and suggested more modeling relationship between accruals and cash flow helps understanding factors influencing earnings quality (Scholer, 2004). Low earnings quality is defined by low earnings stability (Lev and Thiagarajan, 1993). Low stability reduces earnings accountability (Collins and Kothari, 1989). Kormandi and Lipe obtained earnings stability coefficient using regression between current year earnings and last year earnings. The closer is the coefficient to one or even larger, earnings stability is higher (Kormandi and Lipe, 1987). Various criterion for earnings quality measurement show the earnings is more optimal that reflects cash flows (Harris et al., 2000; Penman 2001, Francise et al, 2004).

In primary studies, simple criteria such as sum of accruals (Healy, 1985) and changes in sum of accruals (DeAngelo, 1986) were used for accruals quality measurement. The larger are these criteria, quality of accruals is lower. In recent studies, regression between accruals and specific financial variables related to accruals such as income changes, operating profit or operating cash flow have been used for accruals quality measurement, so that residual in the regression reflects estimation error of accruals and this estimation error is used as an index for accruals quality measurement (Dechow, Sloan and Sweeney, 1995; Guay, Kothari and Watts, 1996; Thomas and Zhang, 2000).
Lev and Thiagrajan studied relationship between earnings quality and stock return. To this end, they considered 12 basic variables which are used in earnings quality evaluation by financial analysts. They measured earnings quality by assigning zero and one score to them. Then, they classified sample companies into five groups based on reduced earnings quality, and estimated average earnings response coefficients. They found groups with higher earnings quality have higher Earnings response coefficient which is consistent with the theoretical expectations (Lev and Thiagrajan, 1993).

Some authors studied relationship between earnings quality and disclosure of future expected profit. In this work, the earnings quality was calculated through correlation between stock return and earnings. Findings showed companies with low earnings quality disclose predicted future profit more, and have high sale growth and changes in their profit. Also, Lougee and Masquardt (2001) found information content of predicted future profit of these companies changes regularly by earnings quality. Authors did not consider management motives in investigating determinant factors of predicted future profit reporting, because management motives are not observable and it was not clear whether purpose of the management is informing investors or making them confused (Lougee and Masquardt, 2001).

Effect of earnings quality on capital markets and relationship between earnings quality, cost of debt and cost of equity were investigated for the sample companies during the years 1988 to 1999. Francis et al. (2002) used 8 indexes for calculating earnings quality. Four indexes were calculated based on adjusted Jones model and four indexes were calculated based on Dechow and Dichev's model. In all indexes, companies with low earnings quality had high capital cost. Findings supported research hypotheses significantly (Francis, LaFond, Olsson and Schipper, 2002).

Dechow and Dichev (2002) investigated relationship between accruals quality and continuation of profit. Their experimental criterion for accruals quality was regression of working capital changes based on past, current and future operating cash flows. The lower is standard deviation of regression residuals, accruals quality is higher. Their findings showed there is positive relationship between accruals quality and continuation of profit (Dechow and Dichev, 2002).

Richardson (2003) selected a sample of American companies during 1990 to 1998 and investigated if short seller investors understand information implicit in accruals (earnings quality index) and use it in their predictions. Their findings suggested short sellers do not used information implicit in accruals in future profits. In other words, they do not consider earnings quality (Richardson, 2003).
Ashbaugh and Lafond (2003) studied quality of working capital accruals at international level. Their findings suggested quality of working capital accruals is higher in the countries which have relatively similar tax and financial reporting (Ashbaugh and Lafond, 2003).

In a study, relationship between accruals reliability and earnings stability was investigated. Findings by Richardson et al. (2004) showed accruals with lower reliability and highest potential error lead to low earnings stability and investors predict this stability in earnings les (Richardson et al., 2004).

Dechow and Schrand (2004) showed if market value is good representative for intrinsic value, reduced relationship between stock return and earnings suggest reduction of earnings quality. In this work, if earnings quality was high, it reflects current performance and it is good index for future performance and represents intrinsic value of business unit correctly (Dechow and Schrand, 2004).

Jeffrey, Ge and Vay (2005) investigated relationship between accruals quality and internal control environment for 552 companies, in which at least one important weakness in their internal control was reported during 2002 to 2005. In weak internal control environment, there is possibility of intentional or unintentional deviation in accruals through earnings management or error in estimating. Findings showed important weaknesses are related to optimal accruals low quality and accruals quality is increased by improvement in internal control quality (Jeffrey, Ge and Vay, 2005).

Lev, Li and Sougiannis (2005) investigated share of accruals in predicting cash flows for determining effect of accruals in financial information quality and found accruals do not have high share in predicting cash flow, both in group or individual manner, but they predict net profit and future year operating profit better than operating cash flows (Lev, Li and Sougiannis, 2005).

Ecker, Francis, Olsson and Schipper (2005) studied quality of current and non-current accruals and total accruals. Their findings showed non-current accruals have lower quality compared to current accruals. In addition, although estimation of total accruals quality is possible for limited number of companies, such estimation is not necessary, because current accruals quality is an appropriate criterion and alternative for total accruals quality (Ecker, Francis, Olsson and Schipper, 2005).

Richardson, Sloan, Soliman and Tuna (2005) showed temporary estimation error of accruals is the main factor leading to poor stability of accrual components of earnings, and it is somehow related to management deviation. Also, this factor causes that reliability of accruals becomes lower compared to operating cash flows (Richardson, Sloan, Soliman and Tuna, 2005).
Chan et al. (2006) studied relationship between accruals components and future stock return. Their findings suggested companies with high accruals values face reduced stock return in the period after financial reporting. They classified accruals to optional and non-optional accruals (Chan et al., 2006).


**Methodology**

This research is retrospective study (using past information). Since the study investigates relationship and correlation between variables using regression equations, it is correlation type research (Azar and Momeni, 2004). Data were collected using Sahra Software and Tadbir Paraz CD as well as from Stock Exchange website. Research hypotheses were tested using SPSS Software.

<table>
<thead>
<tr>
<th>Stock Return</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating cash flows</td>
<td>Earnings quality</td>
</tr>
<tr>
<td>Earnings predictability</td>
<td></td>
</tr>
<tr>
<td>Reported earnings stability</td>
<td></td>
</tr>
<tr>
<td>total liabilities</td>
<td></td>
</tr>
<tr>
<td>Company's working capital accruals</td>
<td></td>
</tr>
<tr>
<td>Logarithm of company assets</td>
<td>Firm size</td>
</tr>
</tbody>
</table>

**Research Variable Measurement**

- **Stock return** ($R_{i,t}$): following formula is used for measuring stock return (Esmaeeli, 2005):

$$R_{i,t} = \frac{(1 + \alpha)P_1 - P_0 + DPS - 1000 \beta}{P_0} \times 100$$

$R_{i,t}$: actual return of company i in period t
**P**: stock price at the end of period

**P₀**: stock price at the beginning of period

**DPS**: Dividend per share

**α**: Percent of total capital increase

**β**: Percent of capital increase from cash and receivables

Nominal price per share of the stock exchange companies is 1,000 RLS.

- **Earnings Quality (EQᵢₜ):** Five criteria are used for its measurement.
  - **Criterion 1:** the first definition of earnings quality is based on relationship between operating cash flows and operating profit. In other words, $R^2$ resulting from operating cash flow and earning is considered as a criterion of earnings quality. To this end, following model was estimated (Saghafi and Kordestani, 2003).

\[
\text{CFO}_{i,t} = \alpha_0 + \alpha_1 \text{OP}_{i,t-1} + \varepsilon_{i,t}
\]

\[\text{CFO}_{i,t} : \text{cash flows resulting from operating activities}\]

\[\text{OP}_{i,t-1} : \text{operating profit}\]

  - **Criterion 2:** the second definition is based on earnings profitability. To this end, following model was estimated (ibid).

\[
\text{PROF}_{i,t} = \lambda_0 + \lambda_1 \text{PROF}_{i,t-1} + \varepsilon_{i,t}
\]

\[\text{PROF}_{i,t} : \text{Annual profits before extraordinary items}\]

The higher $R^2$ resulting from future earnings regression and past earnings, earnings profitability and earnings quality is higher.

- **Criterion 3:** third definition of earnings quality is reported earnings stability. Earnings stability means current year earnings continuation, and the higher is earnings stability, it is more able to protect current earnings and it is assumed company's earnings quality is higher. To this end, following model was estimated (ibid):
\[ \text{PROF}_{i,t} = \gamma_0 + \gamma_1 \text{PROF}_{i,t-1} + \epsilon_{i,t} \]

If coefficient \( \gamma_1 \) is statistically significant in the above model, earnings are considered as stable.

- **Criterion 4:** fourth definition of earnings quality is the company's liabilities. Increase (decrease) of accruals suggests decrease (increase) in earnings quality (Dechow, 1994). Relationship between net profit, operating cash flows and accruals is used for accruals measurement (\( \text{ACCR}_{i,t} \)). Accruals part is equal to net profit minus operating cash flows (Sloan, 1996).

\[
\text{Net profit} = \text{accruals} + \text{operating cash flows}
\]

Calculated accruals are divided by average book value of total assets during years \( t \) and \( t-1 \) and then it is multiplied by -1 so that earnings quality is obtained.

- **Criterion 5:** fifth definition of earnings quality is quality of working capital accruals, and it is calculated based on following regression (Dechow and Dichev, 2002; McNichols, 2002):

\[
\text{TCA}_{i,t} = \kappa_0 + \kappa_1 \text{CFO}_{i,t-1} + \kappa_2 \text{CFO}_{i,t} + \kappa_3 \text{CFO}_{i,t+1} + \kappa_4 (\Delta \text{Sales}_{i,t} - \Delta \text{AR}_{i,t}) + \kappa_5 \text{PPE}_{i,t} + \epsilon_{i,t}
\]

\( \text{TCA}_{i,t} \): total working capital accruals, which is measured using following relationship:

\[
\text{TCA}_{i,t} = \frac{\Delta \text{CA}_{i,t} - \Delta \text{CL}_{i,t} - \Delta \text{CASH}_{i,t} + \Delta \text{STDEBT}_{i,t}}{\text{Average book value of total assets during years } t \text{ and } t-1}
\]

\( \Delta \text{CA}_{i,t} \): change in current assets during years \( t \) and \( t-1 \)

\( \Delta \text{CL}_{i,t} \): change in total current debts during years \( t \) and \( t-1 \)

\( \Delta \text{CASH}_{i,t} \): change in cash during years \( t \) and \( t-1 \)

\( \Delta \text{STDEBT}_{i,t} \): change in current portion of facilities received during years \( t \) and \( t-1 \)

\( \text{CFO}_{i,t} \): operating cash flows divided by average book value of total assets during years \( t \) and \( t-1 \)

\( \Delta \text{Sales}_{i,t} \): change in sale income during years \( t \) and \( t-1 \), divided by average book value of total assets during years \( t \) and \( t-1 \)

\( \Delta \text{AR}_{i,t} \): change in received accounts during years \( t \) and \( t-1 \), divided by average book value of total assets during years \( t \) and \( t-1 \)
PPE_{it}: Net value of tangible fixed assets in year t, divided by average book value of total assets during years t and t -1

ε_{i,t}: residuals from regression. Standard deviation of these residuals during years t to t – 3 is index for quality of working capital accruals. The higher is SD; the quality of working capital accruals is lower. Then, it is multiplied by -1 and with the new criterion, the higher is SD, its quality is higher too (Francis, et al., 2004).

Testing Research Hypotheses

Normality of variables was investigated using non-parametric method of Kolmogorov–Smirnov test. Multivariate regression was used for analyzing research hypotheses, F test was used for investigating total significance of the model, and t statistics was used for examining significance of coefficients and regression.

\[ R_{it} = \beta_0 + \beta_1 \cdot EQ_{it}^x + \varepsilon_{i,t} \]

In order to investigate significance of the coefficients obtained, t statistics was used and following statistical hypotheses were designed:

\[
\begin{align*}
H_0: & \quad \beta = 0 \\
H_1: & \quad \beta \neq 0
\end{align*}
\]

H₀ suggests lack of relationship between earnings quality and stock return; while H₁ suggests presence of such relationship. In other words, null hypothesis denotes lack of relationship between independent variable and dependent variable, and H₁ denotes presence of such relationship.

H₁: there is positive significant relationship between operating cash flows criterion and stock return.

Table 1. Coefficients and t statistics for H₁

<table>
<thead>
<tr>
<th>Hypothesis test result</th>
<th>Relationship</th>
<th>p-value</th>
<th>t-statistic</th>
<th>Std. Error</th>
<th>B</th>
<th>constant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported</td>
<td>Positive</td>
<td>0.000</td>
<td>6.326</td>
<td>0.023</td>
<td>0.257</td>
<td>constant</td>
</tr>
</tbody>
</table>
As observed in above table, results suggest positive correlation between cash flows and stock return as 0.721, which denote a strong positive relationship.

H2: There is positive significant relationship between earnings predictability criterion and stock return.

Table 2. Coefficients and t statistics for H2

<table>
<thead>
<tr>
<th>Hypothesis test result</th>
<th>Relationship</th>
<th>p-value</th>
<th>t-statistic</th>
<th>Std. Error</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported</td>
<td>Positive</td>
<td>0.000</td>
<td>5.098</td>
<td>0.031</td>
<td>0.435</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.006</td>
<td>1.834</td>
<td>0.011</td>
<td>0.529</td>
</tr>
</tbody>
</table>

As observed in above table, results suggest positive significant relationship between earnings predictability and stock return as 0.529, which is an average relationship.

H3: There is positive significant relationship between reported earnings stability criterion and stock return.

Table 3. Coefficients and t statistics for H3

<table>
<thead>
<tr>
<th>Hypothesis test result</th>
<th>Relationship</th>
<th>p-value</th>
<th>t-statistic</th>
<th>Std. Error</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported</td>
<td>Positive</td>
<td>0.000</td>
<td>3.053</td>
<td>0.036</td>
<td>0.749</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.008</td>
<td>2.846</td>
<td>0.015</td>
<td>0.858</td>
</tr>
</tbody>
</table>

Results show positive significant relationship between reported earnings stability criterion and stock return as 0.858, which is at high level.

H4: There is positive significant relationship between total liabilities criterion and stock return.
Table 4. Coefficients and t statistics for H4

<table>
<thead>
<tr>
<th>Hypothesis test result</th>
<th>Relationship</th>
<th>p-value</th>
<th>t-statistic</th>
<th>Std. Error</th>
<th>B</th>
<th>( \text{EQ}_{it} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported</td>
<td>Positive</td>
<td>0.000</td>
<td>5.906</td>
<td>0.024</td>
<td>0.867</td>
<td>constant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.001</td>
<td>3.754</td>
<td>0.019</td>
<td>0.207</td>
<td>( \text{EQ}_{it}^4 )</td>
</tr>
</tbody>
</table>

Results show positive significant relationship between total liabilities and stock return as 0.207, which is a positive weak relationship.

H5: There is positive significant relationship between working capital accruals criterion and stock return.

Table 5. Coefficients and t statistics for H5

<table>
<thead>
<tr>
<th>Hypothesis test result</th>
<th>Relationship</th>
<th>p-value</th>
<th>t-statistic</th>
<th>Std. Error</th>
<th>B</th>
<th>( \text{EQ}_{it} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supported</td>
<td>Positive</td>
<td>0.000</td>
<td>1.739</td>
<td>0.016</td>
<td>0.361</td>
<td>constant</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.000</td>
<td>1.076</td>
<td>0.012</td>
<td>0.163</td>
<td>( \text{EQ}_{it}^5 )</td>
</tr>
</tbody>
</table>

Results for testing last hypothesis shows relationship between working capital accruals and stock return is at lowest level compared to other earnings quality items (0.163), which is a positive and very weak relationship.

Relationship between earnings quality measurement criteria and stock return is as follows:

- **Criterion 1** \( R_{it} = 0.257 + 0.721 \cdot \text{EQ}_{it}^1 \)
- **Criterion 2** \( R_{it} = 0.435 + 0.529 \cdot \text{EQ}_{it}^2 \)
- **Criterion 3** \( R_{it} = 0.749 + 0.858 \cdot \text{EQ}_{it}^3 \)
- **Criterion 4** \( R_{it} = 0.867 + 0.207 \cdot \text{EQ}_{it}^4 \)
- **Criterion 5** \( R_{it} = 0.361 + 0.163 \cdot \text{EQ}_{it}^5 \)
Given obtained results, it is clear:

Criterion 3 > Criterion 1 > Criterion 2 > Criterion 4 > Criterion 5

**Conclusion**

Current work aims at investigating effect of earnings quality on stock return. Five criteria were considered for earnings quality measurement. Five earnings quality measurement criteria are used in this work. The first criterion is earnings quality based on relationship between operating cash flow and operating profit. Second criterion is earnings quality based on profit prediction capability. Third criterion is stability of reported earnings. Fourth criterion is measurement of total liabilities and fifth criterion is measurement of quality of working capital accruals. Then effect of the criteria on stock return was studied separately.

To this end, given the reviewed literature, research hypotheses were designed. Results of hypothesis testing showed there is positive significant relationship between earnings quality and stock return, relationship between earnings quality measurement criteria with stock return was as follows (from strong to weak): 1. Third criterion (stability of reported earnings), 2. First criterion (relationship between operating cash flow to operating profit), 3. Second criterion (potential expected profit), 4. Fourth criterion (total liabilities), 5. Fifth criterion (quality of working capital accruals).

**References**


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