

Earnings quality and P/E ratio: Evidence from Tehran Stock Exchange

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ABSTRACT

This paper evaluates the impacts of earnings quality criteria on the ratio of price to earnings per share (P/E) on 88 accepted companies in Tehran Stock Exchange (TSE) over the period 2007-2012. The results indicate that there was a positive and significant relationship between the P/E ratio and cash dividend. There is also a positive and significant relationship between P/E ratio as dependent variable and the gross profit ratio to sales. On the other hand, there is a significant reverse relationship between P/E ratio and the profit variability. However, no significant relationship exists between P/E as dependent variable and deferrals (accruals) variable.

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1. Introduction

One of the most important issues in investment is to find suitable method for net profit calculation based on accounting methods and estimations. Therefore, there is a possibility of manipulation by manager (Jones, 2002; Hendriksen et al., 1982; Skinner & Soltes, 2011; Francis et al., 2004, 2005). According to representative theory, manager's motivation in manipulating the profit is to reach his/her objectives, which neither meets shareholders' goals nor exchange officials (Mikhail, 1999, 2003). Financial bills accomplish disclosing information on commercial real estates, which are the basis of decision-making for investors and credit-givers. Therefore, investors, property men and interested parties should consider proper criteria and factors, and focus their attention from emphasizing only profit number (quantity) to quality side of profit for the following reasons,

1. Investors, property men's awareness of performance with regard to the quality of provided information,

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2. Investors, credit-givers' awareness of relationship between evaluation criteria of profit's quality and proportion of price to the profit of each share as well as impact of involved variables in research in their decision-making,

3. Applicability: This is because profit-related information compared with other reported information by accounting system is more attracted to investors. Therefore, heeding the quality features of the reported profit is of great importance. Quality of profit is one of the significant aspects of estimating financial health of a company, which is associated with capability of reported profit in reflection of real profit, profitability in predicting future's profit as well as constancy, stability and unchangeably of the reported profit. Profit's quality in financial reporting may influence investors' insurance in financial markets. Therefore, performing researches on profit's quality ground is of great significance. The main objective of this research is to find out on what relationship exists between evaluative criteria of profit's quality and proportion of price to profit of each share in verified companies in Tehran's stock exchange.

2. Literature Review

Chan et al. (2004) analyzed the relationship between profit's quality and shares returns over the period 1985- 2004. According to their survey, there was a low-level relationship between high commitment items in profit with low returns and vice versa. This research showed that firms with high commitment items could own 9% returns for a 12 month period, while firms with low level commitment items maintained 17.5 % returns. Richardson et al. (2001) analyzed the relationship between commitment items and profit's quality of commercial unit. They reported that there was a link between high (low) level of commitment items and low (high) returns of future shares, and financial analysts did not reflect the information related to low quality of profit in their reports. Dechow and Dichev (2002) analyzed the role of commitment on firm' performances. Their research showed that features of every company like absolute value of commitment item rate, operational cycle, the standard deviation of sales, accruals, cash flows, earnings and firm size could be used as a tool to assess the quality of earnings. Penman (2003) examined the quality of earnings and described that when earnings quality was high, the gain was well indicative of future profits. In other words, with high-quality earnings, profits were stable, and vice versa. Ahmadi (2007) assessed earnings quality using qualitative characteristics of financial information. He reported that earnings response coefficient and explanatory power (R) regression Price - a profit in the portfolios of companies with high earnings quality than firms with low earnings quality was significantly higher. Naderi (2005) analyzed the quality of earnings in forecasting future earnings. He reported that there was a positive and strong relationship between cash gained from operational activities to operational profits and future's profit. In addition, there was a negative and strong link between all of commitment items and future's profit.

Abuyy Mehrizi (2011) analyzed the effect of earnings quality, examining the sensitivity of investment than accounting profit. She reported no significant relationship between investment variable and the main independent variables. In addition, there was no significant relationship between earnings quality and the sensitivity of investment to interest accruals. Kabiriy (2007) examined the relationship between earnings quality and performance of growth and value firms listed on Tehran Stock Exchange. She showed that there was a significant positive relationship between earnings quality and growth performance.

Ismaili (2006) examined the relationship between earnings quality and stock returns on listed companies at Tehran Stock Exchange. Investigating the research hypothesis indicated that there was a weak relationship between the quality of earnings and stock returns. Hesady (1999) examined the ratio of price to earnings per share in firms accepted on Tehran Stock Exchange. She showed that the ratio of stock price to earnings per share and returns was correlated. Adham (2008) assessed the

relationship between stock returns and earnings quality, accounting conservatism. He showed that there was a direct relationship between conservatism and earnings quality, and there was no relationship between conservative accounting and stock returns. Hussein (2008) examined the relationship between earnings quality and auditor's opinion on listed companies at Tehran Stock Exchange. She showed that there was a relationship between earnings quality and audit opinion. Saeedi (2007) studied the quality and deferred profit with the stock returns. He showed that there was a reverse relationship between stock returns and discretionary components. However, there was not any relationship between non-discretionary components of deferred and stock return. Behbahani-Nia (2009) examined the accruals and future stock returns and firm size by emphasizing institutional shareholders ownership. She showed the ability of accruals to predict returns independent of the percentage and number of ownership of institutional investors.

3. Research hypothesis

The present study was performed to evaluate and to test the following hypotheses:

Main hypothesis: There is a relationship between measures of earnings quality to price ratio of profits for per share.

1. There is a connection between the realized earnings and price ratio of profits per share.
2. There is a connection between the deferred amount and price ratio of profits per share.
3. There is a connection between variability of earnings and price ratio of profits per share.
4. There is a connection between gross earnings of sales amount and price ratio of profits per share.

4. Research Methodology

A survey of selected firms listed on Tehran Stock Exchange, which have been on the same period, have had no trade-off, and have not changed in financial terms in the course of the investigation. In order to determine the sample size, the initial sample size of 12 participants randomly selected and sample variance of the dependent variable that is the ratio of price to earnings per share was calculated 3.75 and finally 81 firms were selected for the proposed study of this paper.

In this study, depending on the case, the following methods were used to analyze the data:

- 1) *Descriptive methods:* frequency tables, bar graphs, dispersion and central tendency and dispersion parameters are used.
- 2) *Analysis of the assumptions:* the Kolmogorov test methods used for the determination of normality, whereas the Watson camera was used to assess normality of errors as assumptions of combined linear regression. In addition, Chaw and Housman test was used to determine combined regression assumptions or data panel.
- 3) *Determining the relationship between variables:* Combined linear regression was used to determine the relationship between variables.
- 4) *Generalization of the findings:* in order to generalize the assumed relation of random samples to statistical population, Fisher test and significant regression parameters were used.
- 5) *Applications:* for pre-processing data EXCELL software, and for calculation and statistical analysis SPSS software, version 22 were used.

4.1 The research model

This study was to analyze the following general equation:

$$Y = f(x_1, x_2, x_3, x_4),$$

where the variables are defined as follows:

Table 1

Definition of variables Item Description Symbol calculated

Item	Description	Symbol	Calculation
1	Price of each share's earnings	Y	Stock Price/ Earn Per Share
2	Realized cash earnings	X ₁	Operational earnings, cash derived from operational activities
3	The deferred amount	X ₂	Change in current portion of loans received + change in cash - Change in Current Liabilities - Assets change
4	Changeability of earnings	X ₃	Average earning per share, criteria deviation of each share's earning
5	Gross profit		Sales, gross profit

B_1 = the change in the dependent variable resulting from a unit change in the independent variable, B_0 = the width of the source, e_i = the error component

In this study, the relationship between variables is estimated by using combined linear regression in a parametric connection.

$$y_i = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + e_i$$

In this equation, the unknown parameters B_0 , B_1 , e_i in regression method is estimated separately based on company performance in the year under review.

5. The research findings

In this section, based on performance data processing companies in the random sample, description of findings are initially given. In continuing evaluation of assumptions, combined linear regression is used as a method of determining variables. Finally, by using combined method and applying combined linear regression, the relation between variables is estimated and generalized by parameters test of statistical population. Table 2 shows descriptive statistics of variables, which includes 486 years - the company over the period 2006-2011.

Table 2

Description Findings

Variable	Mean	Medium	St. Deviation	Minimum	Maximum
P/E	2.545	2.123	13.1278	1.125	4.367
CFO/OI	0.934	1.312	8.678	1.492	0.321
AC	0.653	0.843	4.578	0.212	0.947
VAR_OI	1.675	1.132	3.542	0.853	2.869
ROS	0.231	0.167	7.153	0.051	0.345

Based on Table 2, median and mean values of each variable are shown. Price variables, earnings per share, profit and gross profit to sales variability have positive skewedness (skew to the right) and variable cash realized gains and the amount of accruals have negative skewedness. Based on the previous studies in this research, combined linear regression was used to determine relationships between variables in this research as well. This method is based on assumptions such as normality, distribution of the remaining and variables, the linear independence of variables and other assumptions that are evaluated in this part of the establishment. In order to establish the necessary assumption of additive linear correlation between variables, the Pearson criterion variables were used to determine linear independence. Correlation coefficients between variables with a significance level

(sig) are shown in Table 3. As we can observe, since the estimated correlation between the independent variables coefficients tends towards zero, the assumption of linear independence of the independent variables can be accepted. Its significant level also tends to zero and the linear independence of the generalizability of the study population is provided.

Table 3

Correlation coefficients between variables

Variables	<i>P/E</i>	<i>CFO/OI</i>	<i>AC</i>	<i>VAR OI</i>	<i>ROS</i>
<i>P/E</i>	1				
	-				
<i>CFO/OI</i>	0.332 0.001	1			
	-0.238 0.024	-0.432 0.012	1		
<i>AC</i>	-0.241 0.005	-0.212 0.000	0.376 0.011	1	
<i>VAR OI</i>	0.512 0.000	0.216 0.0001	0.421 0.003	-0.141 0.0018	1
<i>ROS</i>					-

To assess the legality of using a combined regression, Chow test is used and they are shown in Table 4. According to the statistics we can conclude that during all the years of testing, the null hypothesis was rejected based on the equality of the intercept, so the intercept inequality is accepted 99.

Table 4

The Summary of Chow Test

Description	F Statistic	Sig. Level	Test Result
Amount	3.123211152	0.00000	Reject of H_0

To determine the type of combined regression in setting connections between variables, Housman test is used. In Housman test, H_0 theory is based on compatibility of random estimations in contrast to H_1 theory, which is based on incompatibility of test's random estimations. The results of the Hausman test for regression models of this study are shown in Table 5. The results show that Chi-Square statistics for Hasuman test regarding the involved model is equal to 63.292687, which is in 99 % significant level that verifies H_1 theory. Therefore, regarding Housman test, processing regression model in this research by using estimation of panel data models with fixed effects method would be appropriate.

Table 5

Housman test for regression model of research

Description	Chi Square Statistic	Sig. Level	Test Result
Amount	63.292687	0.00000	Reject of H_0

To check the normal distribution of the dependent variable, Kolmogorov Smirnov Test is used. This test was performed for the variable price to earnings per share (dependent variable), and the result showed normal distribution of the dependent variable. KS test with SPSS output tables for these variables are summarized in Table 6:

Table 6

Kolmogorov Smirnov test for dependent Variable (P/E)

Description	Kolmogorov Statistic	Sig. Level	Test Result
Amount	1.204	0.00000	The Distribution is Normal.

According to Table 6 and Kolmogorov Smirnov Z statistics, since the significance level (0.111) is more than 5%, H_0 hypothesis is accepted. We can say confidently that with 95% confidence the

variable of price to earnings per share is normally distributed. Similarly, estimation of normality of variables distributions for independent variables was carried out and they are summarized in Table 7 as follows,

Table 7
Kolmogorov Smirnov test for in-dependent Variables

Description	Kolmogorov Statistic	Sig. Level	Test Result
<i>CFO/OI</i>	0.150	0.077	The Distribution is Normal.
<i>AC</i>	0.145	0.099	The Distribution is Normal.
<i>VAR_OI</i>	0.179	0.078	The Distribution is Normal.
<i>ROS</i>	0.189	0.057	The Distribution is Normal.

According to Table 7, the significance levels for all independent variables were higher than 5 %. Therefore, assuming normal distribution of these variables will be accepted at 95 %. The Watson camera test has been used to test of the independence of errors. The regression test results with some validation parameters are summarized in Table 8. As we can observe, Durbin-Watson ratio is equal to 1.825, which is within the acceptable level and this implies that there was no correlation among residuals.

Table 8
Test of Errors In-dependency

Description	R	R Squared	Adjusted R-Square	Standard Error	Durbin Watson Statistic
Amount	0.6565	0.431	0.389	0.079288211	1.825

In order to find out whether distribution of error terms are close to normal, we present details of residuals for dependent variable in Fig. 1 as follows,

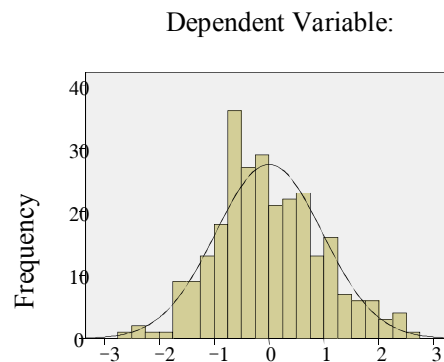


Fig. 1. Assessment of normal distribution of errors in estimating equation

As it is shown in Fig. 1, the distribution looks close to normal. Results of multi co-linearity between the independent variables are summarized in Table 9. Based on these results, the level of tolerance and variance for the two variables 0.978 and 1.028, respectively, which means we can conclude there was no co-linearity among independent variables.

Table 9
The Summary Results for Co-Linearity Test

Variables	CFO/OI-AC	CFO/OI-ROS	CFO/OI-VAR_OI	AC-ROS	AC- VAR_OI	ROS- VAR_OI
Tolerance	0.978	0.707	0.461	0.951	0.962	0.981
T. Factor	1.028	1.415	2.175	1.046	1.032	1.017

Given the assumptions of linear regression to establish the compound as described in the preceding paragraph, in this part, combined linear regression was used to estimate relationships between variables. General equation for the mode parameter to comment is:

$$P/E_{it} = \beta_1 + \beta_2 CFO/OI_{it} + \beta_3 AC_{it} + \beta_4 VAR_OI_{it} + \beta_5 ROS_{it} + \varepsilon_{it}$$

Table 10 shows regression analysis of variance to examine the linear relationship between the independent variables and the dependent variable and overall significance of regression model.

Table 10
The Summary of Analysis of Variance Test

Parameter	Sum of Squares	Degree of Freedom	Mean of Squares	F Statistic	Sig. Level
SSR	0.372	4	0.0931215	----	-----
SSE	2.955	483	0.0061192	-----	-----
SST	3.327	487	----	15.218	0.000

According to Table 10, significance level is less than 5%. Therefore, the hypothesis H_0 is rejected and H_1 assumption is accepted based on relationships between variables. The regression coefficients and constant with t-statistics and significance levels are presented in Table 11.

Table 11
Results of the fitting of the regression equation

$P/E_{it} = 1.45 + 0.326 CFO/OI_{it} - 0.421 VAR_OI_{it} + 0.527 ROS_{it} + \varepsilon_{it}$					
Variable	Symbol	Coefficient	T-Student Statistic	Sig. Level	
Dependent	<i>Constant</i>	1.45	6.1032	0.0000	
In-Dependent	<i>CFO/OI</i>	0.326	3.154	0.0020	
In-Dependent	<i>VAR_OI</i>	-0.421	-2.380	0.0180	
In-Dependent	<i>ROS</i>	0.527	-2.619	0.0090	

R-Square = 0.431 F-Statistic = 15.218 Adjusted R-Square = 0.389 P-Value = 0.000

In the case of a fixed amount (1.45) statistic t is, 6.1032 and a significance level is 0.000, so that the null hypothesis of equality of constant is rejected by zero and significant assumptions constant (1.45) is approved at 95 % confidence level. Earning cash realization ratio (0.326) has the statistic t, 3.451, and a significant level of 0.002, so the assumption of equal regression coefficient was rejected by zero amount and assumption of the significance of cash realized gain (0.326) in the 95% will be confirmed at 95 % and need not to be removed from the regression equation. Accruals volume factor (-0.268) has a statistic t, -1.219 and a significance level of 0.223, so assuming the equality of regression coefficients with zero value is not rejected and the assumption of significant accruals volume factor (-0.268) is rejected at 95 % confidence level. Accruals size variable in the regression equation cannot be imported because its changes statistically does not impact the dependent variable. Regarding the coefficient of variation in earnings (-0.421) has statistic t, -2.380 and a significance level of 0.018, so assuming the regression coefficients equal zero is rejected and the assumption of significant benefit rate variability (0.421) is 95 % at confidence level. In addition, earning's variability of variable can be imported in regression equation because its changes can statistically influence the dependent variable.

The ratio of gross profit to sales (0.527) has a statistic t, -2.619 and a significance level of 0.009, so assuming the regression coefficients equal zero is rejected and significant gross profit to sales ratio (0.527) is verified at 95 % confidence level. In addition, we can import gross profit variable into sales in regression equation because its changes can statistically impact the dependent variable.

By replacing the estimated parameters mentioned above in Table 11, the regression equation is what follows:

$$P/E_{it} = 1.45 + 0.326 CFO/OI_{it} - 0.421 VAR_OI_{it} + 0.527 ROS_{it} + \varepsilon_{it}$$

Briefly, these outcomes show that cash realized variables of profit and gross profit ratio to sales have direct relationship with price ratio profit of each share and variability of variables has a reverse relationship with price ratio of each share's profit. The absolute value of standard coefficients shows the estimation of these variables that severity of this relationship for gross profit variable was more than other variables. This means that a single change in the ratio of gross profit to sales, compared with other independent variables, will have a greater impact on the dependent variable.

As shown in Table 11, the F-statistic indicates the overall significance of the regression model and all coefficients are significant at the 95% confidence level. The coefficient of determination and the adjusted coefficient of determination of the model are 1.43 and 9.38, respectively.

6. Conclusion

The main theory of the four sub-hypotheses has been tested using the regression model. The model used panel data with fixed effects to examine the relationship between the dependent variable, price to earnings per share, and independent variables, realized cash profits, the amount of accruals, earnings variability, and the ratio of gross profit to sales. In summary, the results of this study at 95% of confidence level (5% error) indicate that the dependent variable of the price to earnings per share (P/E) with ratio of gross profit to sales, profit and cash realization of variables has a direct (positive) and significant relation and by variability of profit had a significant and negative relationship. The results indicated no significant relationship between the dependent variable price to earnings per share of the accruals variable volume at confidence levels of 95% or even 90%. The evaluation results of the relations between variables indicate:

- 1) At the 95% confidence level, the variable interest cash realization had a significant relation with ratio of price to earnings per share (dependent variable) and by considering the correlation coefficient in the equation (0.326) and we can say this is a significant and positive correlation.
- 2) The level of significance (sig) realization of variable cash is equal to 0.004, which is significantly lower than the values considered in the present study (5%). On the other hand, the absolute value t-statistics $| 871 / 2 |$ is greater than t-statistics obtained from the table with the same degree of freedom (1.96). Therefore, this variable in the regression model fit was significant and the estimated coefficient for this variable can be used.
- 3) The level of significance (sig) accruals variable is equal to 0.124, which is considered much more significant in the present study (5%). On the other hand, the absolute value of t-statistics $| 843/0 |$ is smaller than t-statistic. So accruals size variable regression model fitted was not significant and estimated coefficient cannot be used for this variable.
- 4) At the 95% confidence level, the variability of the variable profit had a significant relation with ratio of price to earnings per share (dependent variable) and by considering the correlation coefficient in the equation (-0.412) we can say this relationship is negative and significant.
- 5) At 95% confidence level, the variable ratio of gross profit to sales had a significant relation with ratio price to earnings per share (dependent variable) and by regarding the correlation coefficient in the equation (0.527), we can say this relation is direct (positive) and significant.

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