

IMPACT OF EARNINGS PATTERNS ON STOCK PRICING AND EARNING QUALITY AN EMPIRICAL STUDY ON TEHRAN STOCK EXCHANGE



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Abstract:-In this study the relationship between earning patterns and stock pricing and earning quality of the listed firms in Tehran Stock Exchange (TSE) have been studied. Earning patterns include profit stability, earning predictability and income smoothing. Sample of the study involve 430 listed firms in TSE, bud due to limitations of the study 98 of them have been selected for the period of 1999 to 2009.

Results show a significant relationship among pricing models, earning quality and earning patterns (stability and predictability), but there is no significant relationship among income smoothing and earning quality and pricing models. In this paper some models have been recommended to predict and measure the intrinsic value stock of listed firms in TSE.

Keywords:Pricing models –earning quality - earnings patterns- profit stability–earning prediction - income smoothing.

INTRODUCTION:-

Accounting scandal and collapse of firms like Enron and WorldCom in USA and Telvan in Australia caused serious concerns about earning management, allocating reported profit and ethical issues of those who prepare these reports and audit them. USA and Australians legislators answered to the firm's failure and their fraud by improving corporate governance principles, Mohammad Kohansal (2004). Accounting development, indeed, attracts investors capital and directs it to the productive public sectors, but in the other hand, considering risk and return, investors prefer to invest in industries with low risk and high return, regardless of whether it is productive or not. Nowadays business crisis, especially for developing countries, they need to use their capital optimally. In this line a recommended way is to develop investment.

Accounting profit which is calculated on the basis of accrual accounting and its component are effective factors in taking decision by decision makers. Based on this approach as soon as a cost or income is realized, they could be reported in financial statements. The question is how reliable this profit is as any cash is transferred in this approach? The answer of this question is important because any decision made on the basis of incorrect information leads to nonoptimal resource allocation khaleghimoghadam, Hamid, Azad and Mohammad (2006). So the information provided to the mentioned users should be reliable enough to take the best decisions, in this line a concept has come to picture called "earning quality". In other words earning quality is considered as a variable to assess the relevance of profit patterns. Virtually, if a firm owns a high earning quality, it's reported profit is a dependable criteria to attract investors who are seeking to find a satisfactory investment in terms of return. In this paper first we analyze the relationships of earning patterns and pricing models, next we investigate the relationship between earning patterns and earning quality. Finally the magnitude of the impact of different levels of earning quality on the effects of earning patterns and pricing models are analyzed.

SIGNIFICANCE OF STUDY

In a published article by Francies, J. R., Lanford, P., Olsson, K., Schipper[2005], they pointed out to the role of accountants in today's economies. Accurate decision making by individuals, firms, governments and so forth, is vital in terms of allocating financial resources, for this purpose dependable accessible information is needed. Means for economic decision making, to do the best, it's necessary to access such information which enable us to allocate resources optimally. One way to access to needed data is availability of financial statements. Francies, J. R., Lanford, P., Olsson, K., Schipper (2005) Valuation of assets either financial or real assets, is one of the main pillars of investment decisions. A proper asset valuation causes an optimal resource allocation which leads to economic growth and development. Asset valuation is such important that is a major issue in investment management.

Investment management has two foremost components: Assessment and analysis of securities and portfolio management.

Improper appraisal and inappropriate asset valuation result in Non-optimal allocation and so wasting resources. Lee, K. W., Lev, B. and Gillian, Y (2007).

For security valuation several factors should be considered, one of these factors is the magnitude of the earning patterns effects which shows the probability of profit manipulation by managers, as a result in this paper we attempt to aware interested investors to this effective issue enabling them to a better economic assessment. Thus, in this line, we point to the earning quality in a way as the less earning quality the more probable the manipulation is, making that report less dependable. In this paper we try to analyze methods which enhance the reliability of investors needed information, by reducing the risk and increasing the probability of their required return. Also we introduce three models to determine the intrinsic value of stocks, so investors can consider and more trust this intrinsic value.

PROBLEM STATEMENT

Profit is a foremost element in financial statements, being basic criteria to assess operation continuity, performance assessment, profitability and predicting future activity of firms. Managers' authority in using accepted accounting principles includes correspondence principle, the existence of accrual principle in this environment and the role assessed items effect the earning quality in terms of managers' discretion. Earning comes to existence when financial analysis reveal at what extend the reported profit represents real one. Earning attributes like stability, predictability, and income smoothing effect on earning quality. In case managers report deceptive profit, it's easy to realize it by measuring earning quality, and recommending some controlling mechanism.

In this paper we attempt to show that earning quality is an effective factor in assessing the relevance of disclosed information in relation to earning pattern. In other words, if an earning pattern represents a higher earning quality, it has a higher impact on pricing model, providing investors to determine the stock price reliably, in other way round the investors will have a higher risk with lower return.

Generally, in the present study we sought to investigate the situation in which the users of financial statements have a higher level of return with lower level of risk, to do so, first the effects of earning patterns of earning quality must be measured, assuring them that the reported earning is unmanipulated. Next, investors determine the intrinsic value of stock with pricing models. After all now investors can take decision with a higher certainty, it also helps investors to understand and take action in case of manipulating earning by managers in order to carry out the assessments.

REVIEW OF LITERATURE

In Iran no one has done such a research. Iranian researchers investigated the relationship of income smoothing with earning quality on other factors. As an example Saghafi and Kordestani (2004) investigated the relationship between earning quality and market reaction to dividend, their study represented that the more the earning quality the more affects profit changes will have on market. Khajavai and Nezami (2006) studied the relationship between earning quality and stock return with emphasis on accrual basis showing a significant relationship between these two variables. In another study Mashayekhi, Mehrani and Karami (2005) represents the situation where firms experience a decrease in operation cash flow caused by poor performance, to compensate this, they to increase profits through discretionary accruals. Pourheydari and RahimiShahsavari (2005) investigated the relationship between sustainability of profit and price to earnings ratio, they found that as the earning is more sustainable the price to earning ratio increases.

In another study by Barth, M. E., Elliott, J. A. and Finn, M.W. (1999), which was an experimental study on the relationship between stock price and earning pattern (incremental profit pattern), they studied the market premium for firms with incremental profit pattern, they also compared these types of firms with those without such a pattern. Based on their findings some firms had a higher price to earnings ratio due to increasing in earning, considering growth and risk compared with other firms. They controlled growth variable by tying it to two factors, first, increase in book value of equity, and second, increase in predicted profit growth. Concerning risk variable as well, they control it by calculating the volatility (variance) of last 6 years. They said if increase in earnings is based on earning management, thus, the intrinsic value of stock is different from stock price.

In another study by Schipper, K. and Vincent, L. (2003), they analyzed earning quality assessment factors that had been used in previous studies, those their relationship with profitability and economic definition of earning had been confirmed. They concluded that earning quality other than common criteria depends on type and quantity of contracts based on accounting data.

Kasznik, R. and McNichols, M., (2002). and Bartov, Givoly and Hayn (2002) worked on the tolerance of market by analysts' forecasts. They found that occurrences of these forecasts depend on the price to earnings ratio. They interpreted that when analysts' expectations are realized, the risk is less, so there is a higher price to earnings ratio. Although, they explicitly mentioned that 1) they didn't analyze the relationship between the lower risk and occurrences of analysts' expectations, 2) they didn't investigate the role of expectation manipulation from earning or even earning itself, they believed that done analysis have covered them. They assumed that investors will invest in firms in which their yield is more than analysts' expectations or at least the mentioned expectations are met, and there exists a high earning quality.

Bartov, Givoly and Hayn (2002), applied a different research project. They reported the highest quarterly return which occurred according to analysts' prediction. They interpreted that earning efficiency goes beyond than variations in analysts' prediction. The link of this study is when there is no evidence in relation to earning management or expectation management, the premium of exceeding market level is less. In the situation where the required earning was equal to predicted one, they defined it as a combination of first, analysts' negative prediction and second, zero and positive earnings. But, in another situation of being required earning more than predicted type, it was defined as an unpredicted accrual item based on Jones model in which an accrual item is defined as; increase in working capital + reduction in asset value + depreciation. If we want management's or earning management's expectation to be more than financial analysts', a small but reliable change should be made in market premium.

In Thomas, K.J, and Zhang (2002) reported a higher price to earning coefficient for firms with smoother income. They considered instability of internal earnings (earning prediction by analysts considering variable of time) as criteria for management interference in income smoothing. According to the results the less the instability there exists the higher price of income smoothing, which is because of the

relationship between low risk and low instability.

In another paper by Francis, LaFond, Olsson and Schipper [2005], Moyer and Shevlin [2005] like Thomas and Zhang [2005] said that price to earning ratio increases by enhancing income smoothing. Their calculation was earning divided by cash and all accruals, where the accruals are divided into discretionary and nondiscretionary components. Jones model (which modified by Dechow, P. M., Sloan, R. G. and Sweeney after four years) and Hant et al. model by controlling cashflow standard deviation, assess increasing effects of earning to price ratio in below situations:

- 1) Cash standard deviation and nondiscretionary components would be low in comparison with cash flow standard deviation.
- 2) Reported net profit standard deviation would be low compare to Cash standard deviation and discretionary components.

The first case is interpreted as the reason of smoothing by nondiscretionary components and the second was because of discretionary components. Evidence showed that discretionary smoothing is more consistent with positive pricing and also higher earnings stability.

Richardson in 2003 showed that accrual components in earning field are not concentrated in one part of accrual components such as current accrual components.

In another study by in 2001 it is evidenced that abnormal accruals are more instable compare to normal accrual components, and also normal accruals are more instable compare to operation cashflows.

Francis, LaFond, Olsson and Schipper in 2005 found that price to earning ratio increases with increasing in earning quality. To control other variables affecting on price to earning ratio, they proposed that affectability of pricing by earning patterns, is affected by earning quality. They evidenced a positive relationship between pricing effects of earning models and earning quality.

RESEARCH METHODOLOGY

This study is a Quasi-experimental type, in accounting positive research field. Financial data is collected from financial statements and reports, accounting softwares and databases. Data collection is library type and experimental. Concerning testing of hypothesis multiple regression has been used.

STATISTICS USED

Statistics used in this paper includes descriptive statistics like mean and standard deviation, also multiple regression and correlation and analysis of variance have been used.

Sampling

Sample of the study is selected from listed firms in Tehran Stock Exchange based on below criteria:

1. They must have been accepted before March 1999.
2. Their year-end should be the around 20th of February (the month of Ispand According to RIC calendar).
3. There shouldn't have been any change in their operations or financial year.
4. Their data should be available.

98 firms are selected among all listed firms during the period of 01/Mmarch/1999 to 19/March/2009.

Operational Definition

1) Dependent Variable: Earning Pattern

Dependent variable of this study is earning pattern which is calculated by three proxies, and the calculations are based on Francis, LaFond, Olsson and Schipper definition.

1-1. Earning Stability: Stability is defined as durability and repeatability of earnings. Earnings from abnormal and unexpected activities are not as stable as earnings from normal activities. Financial analysts and investors don't care about reported accounting profit as determining index, rather durability and repeatability of earnings are important. They concentrate on components of earnings rather than the earning's digit only. In their point of view earnings from repeated operation activities contain more

information compare to unexpected components, as repeatable activities are good criteria to predict future cashflow. In this study the number of years in which increase in earnings is reported are considered to measure the stability of earning. This variable is considered as a five-year time series.

1-2.Earnings Predictability: This variable is a qualitative feature, which is defined as prediction power from itself and is evaluated by analysts, is an important component of evaluation models. In Financial Accounting Standards Board conceptual framework, predictability is a part of relevance and is defined as below:

Data quality helps users to enhance probability of correct outcomes of present or past predictions. Here in this paper, earning predictability represents the number of three-month periods in which the earning is the same or even more than predicted one by managers. This variable also is considered as a five-year period time series.

1-3.Income Smoothing: Income smoothing is a deliberate action showing earning tendency as a general trend. Managers' objective is to achieve a desired specific level of earning. Heyworth's findings in 1953 said "it is used several accounting methods to level off profit in a period of time, thus firms try to allot net profit to Consecutive accounting periods.

Following this claim Mousen , Downs & Gordon (2007) precisely discussed that the basis of managers' motivation for income smoothing is growth rate and profit being stable, not having an increasing trend in profit average following by a broad fluctuations. In this paper according to Francis definition income smoothing is defined as:

$$smooth_{j,t} = S(NIBE_{j,t}) / S(CFO_{j,t})$$

1)Independent Variable: Earning Quality

Recent years most attentions especially after financial scandals has focused on earning quality. There are different definitions and scales regarding earning quality context due to having several aspects. In this study it is calculated by two methods:

2.1The first method is based on Dichov's model which says cash flows could not be manipulated by managers. Therefore the more profit being close to cash flows, the less the aggregate of discretionary accruals will be, thus earning quality is higher. As a result difference between total accruals and cash flow from operating activities reflects the quality of earnings.

2.2 Second method is based on Jones's model which divided accruals into two groups, normal accruals (discretionary) and abnormal accruals (non-discretionary). Discretionary accruals in appose to non-discretionary accruals means those which could be manipulated by administrators. Therefore earning quality equals to negative absolute value of non-discretionary accruals.

1)Control Variables for Equity Pricing Models

3.1Earnings Per Share (EPS)

In this study EPS is considered as changes in net income before unexpected accruals divided by number of shares.

3.2Company Growth

The basis for growth definition is what Francies, J. R., Lanford, P., Olsson, K., Schipper stated as below:

$$growth_{j,t} = \frac{BVE_{j,t}}{BVE_{j,t-6}}^{1/5} - 1$$

3.1Financial Leverage

It is calculated by dividing Total Debt to Book value of Equity.

3.2 Systematic Risk

This variable is determined based on available information in Pars Portfolio software.

Hypothesis

First Hypothesis: There is a positive and significant relationship between Earning Patterns and Equity Pricing.

Second Hypothesis: A positive and significant relationship exists between Earning Pattern and Earning Quality.

Third Hypothesis: Effects of Earning Patterns on Equity Pricing is a function of different levels of Earning Quality.

First Hypothesis Test Results

H₀: There is no positive and significant relationship between Earning Patterns and Equity Pricing.

H₁: There is a positive and significant relationship between Earning Patterns and Equity Pricing.

To test this hypothesis we use below regression model:

$$P = a_0 + a_1 EPS * BETA + a_2 EPS * LOSS + a_3 EPS + a_4 EPS * PATTERN + a_5 EPS * FINU$$

$$pattern_{j,t} = [year\ sin\ c_{j,t}, Qtrsbeat_{j,t}, smooth_{j,t}]$$

Where:

P= Intrinsic value of equity in year t

Loss= Loss of company in year t

FINU= Dummy Variable which is equal to 1 if earning quality is positive and is equal to 0 if earning quality is negative.

Pattern= Three patterns include Earning Stability, Earning Predictability and Income Smoothing. Concerning stability we consider the number of years in which the companies haven't made any changes in their EPS at the end of year during the five-year study period. To measure earning predictability quarterly reports have been pursued, which their reported EPS is compared with the estimated EPS by managers, next, the number of quarters in which the reported EPS is equal or greater than estimated one, are considered for this variable. Income smoothing is calculated as the negative coefficient of standard deviation of net profit before unexpected accruals divided by average of total assets or standard deviation of operation cash flows divided by total assets average. Standard deviation is assumed for years t to t-4.

$$smooth_{j,t} = S(NIBE_{j,t}) / S(CFO_{j,t})$$

Where

NIBE_{j,t} = Net Profit Before Unexpected Accruals

CFO_{j,t} = Operating Cash flow

Table 1-1: Results of testing of hypothesis 1

Variables	Coefficient of Correlation	Level of Significant	Result	R ²
Earning Patterns and Equity Pricing	0.372	0.000	Accepted	0.517

Table 1-1, Relationship between earning patterns and equity pricing

Conclusion of first hypothesis: In this hypothesis we carried out the relationship between earning patterns and equity pricing. Considering coefficient of correlation and 95% level of significance the hypothesis is accepted, thus, it is concluded that there exists a direct and positive relationship between earning patterns and equity pricing, which is in line with the study done by Francis, LaFond, Olsson and Schipper. It represents the more earnings are stable, intrinsic value of a firm is calculated reliably. Also as earnings are more predictable, in other words as less income smoothing is applied by managers, intrinsic value of share is more close to real market value. Therefore investors invest with a great certainty. The results of this study is consistent with Pourheydari and Rahimishahsavari (2003), which studied the relationship increasing earning patterns with equity price, in which they concluded firms having increasing earning patterns possess a higher price to earnings ratio. Our conclusion also is consistent with Barth and Finn statements saying firms having higher earning patterns, their predicted equity price is closer to real value.

Second Hypothesis Test Results

H₀: There is no significant relationship between earning patterns and earning quality.

H₁: There is significant relationship between earning patterns and earning quality.

To test this hypothesis we use below regression model:

$$quality_{j,t} = b_{0,t} + b_{1,t}YEARsin c + b_{2,t}LOSS + b_{3,t}Qtrsbeat + b_{3,t}Smooth + b_{6,t}BETA - b_{7,t}P_{j,t} + b_{8,t}LEVERAGE + b_{9,t}FINU$$

Variables of this model are defined as follow:

YEARSin c= The number of years in which between the year and four years before there has been an increase in EPS.

Smooth= Income smoothing which is calculated by dividing standard deviation of profit before unexpected accruals to operating cash flow.

Qtrsbeat= Earning predictability that is the number of quarters between the year and four years before in which estimated EPS is less than or equal to reported quarterly EPS.

Loss= Loss of firm is near t

Leverage= Financial leverage in year t

Quality= Earning quality based on Dichov and Jones models that result same equations using either of models (Free of sensitivity of which model we are using we get same result).

FINU= Dummy variable which is equal to one when earning quality is positive and equal to zero when it is negative.

Table 1-2: Second Hypothesis Result

Variables	Coefficient of Correlation	Level of Significance	Result	R ²
Earning Quality and Stability	0.123	000/0	Accept	0.514
Earning Quality and Predictability	0.116	001/0	Accept	0.517
Earning Quality and Management	-0.292	0.000	Accept	0.509

Conclusion of Second Hypothesis: Based on information in the table the second hypothesis is accepted, saying with 95% level of significance the null hypothesis (Ho) is rejected, meaning there is a positive relationship between earning quality and earning stability and earning quality and earning predictability. Regarding earning quality and earning management as the bias is less than 5% it is accepted but due to negative coefficient of correlation the relationship between them is negative and significant. In the end we conclude there is significant relationship between earning patterns and earning quality. Our result is consistent with Spicher and Vincent (2003) study in which in addition it was mentioned earning quality is related to contracts carried out based on accounting data. Findings also are in line with Kirschenheiter and Melumad's study that represent earning quality is high in a situation where it is close to

long term firm value and burden a large content.

Third Hypothesis Test Result

H₀: The effect of earning patterns on pricing is a function of quality of computed profit.
 H₁: The effect of earning patterns on pricing is not a function of quality of computed profit.

CONCLUSION OF THIRD HYPOTHESIS:

In this hypothesis we concern about whether different levels of reported earning quality are effective on pricing or not, in other words, comparing earning patterns on pricing at different level of earning quality. To prove this the below regression model has been used:

$$P_{j,t} = b_{0,t} + b_{1,t}EPS * BETA + b_{2,t}EPS * loss + b_{3,t}EPS + b_{4,t}EPS * Pattern * quality^{medium} + b_{5,t}EPS * Pattern * quality^{low} + b_{6,t}FINU + b_{7,t}EPS * leverage$$

Variables are:

Patterns= it involves three patterns stability, predictability and income smoothing, which by replacing any of them in formula same outcome will come.
 Loss= Loss of firm in year t
 Leverage= Financial leverage in year t

= it equals to one if earning quality of a firmj is less than 0.3, otherwise it equal to zero.

= it equals to one if earning quality of firm j is between 0.3 and 0.4, otherwise it equals to zero.

To test this hypothesis it is needed to compare calculated statistic of B₄ and B₅. As it is been seen in table 1-3, for B₄ it is 3.559 and for B₅ it is 2.918. Assuming this difference significant, the effect of earning patterns on pricing is high when earning quality is medium. As the earning quality go down this effect decreases approaching to zero. But according to the model the difference is not significant and p-value is 0.308. We conclude at any category of earning quality the effect of earning pattern on pricing is same, whether quality is high, medium or low.

Table 1-3: Third Hypothesis Result

Variables	t-statistics	Level of Significance	P Value	R ²
Earning Quality at medium level	3.559	0.000	0.000	0.514
Earning Quality at low level	2.918	0.004	0.308	0.519

Generally the objective of this study is to examine the effect of earning patterns on pricing at different earning quality levels, whether it is same at low, medium and high level or no. the results are inconsistent with the result obtained by Francieset.all (2005). In a study they concluded that effect of earning patterns on pricing is depends on earning quality. They found that earning patterns exert a highest effect at higher level of earning quality, and it becomes less and less while the earning quality falls to lower and lower level. This inconsistency could be due to the different methods of earning quality calculation or employing different criterion to categorize earning quality assigning them to high, medium and low level of earning quality.

CONCLUSION

Generally the used regression model during the study period has been significant and the average of model determination coefficient is high. As for the coefficient of all three proxies for earning patterns are

significant and considering sample, the first and second hypothesis are accepted. The results of these hypotheses help investors or others to invest more efficiently (with a higher return and lower risk), receiving more benefit from opportunities, and assessing the reliability of reported earnings (profit). In other words with the findings of these study investors and shareholders are able to analyze the earning patterns and earning quality, determining (estimating) the intrinsic value of share more reliable. In this case the intrinsic value of share is close to the actual value. Therefore, investors better to invest on a company's share which has a higher estimated value, attaining expected return.

According to The findings of third hypothesis there is no need to consider earning quality in pricing, representing the same effect of earning levels, low, medium and high, on pricing model. The findings of present study are inconsistent with the others like Francies, J. R., Lanford, P., Olsson, K., Schipper(2003). This inconsistency might be due to environmental condition of population with other countries.

RECOMMENDATIONS BASED ON STUDY RESULTS

- 1) Recommending to authorities of accounting standards to disclose the information pertaining to earning quality in note to financial statements voluntarily. In addition, these entities should concentrate on regulations improving the quality of reported earnings of firms.
- 2) Considering the importance and the role of earning patterns on share price, it's recommended to security analysts to consider the information related to quality and properties of reported earnings in their analysis.

FUTURE RESEARCH RECOMMENDATIONS:

- 1) As the variables values of study are different in different industries, it's recommended to study the behavior of variables in industry level as well.
- 2) Analyzing other pricing models for estimating the share value when companies are divided into three classes of industries, superior, medium and poor industries.
- 3) Studying on the effects of price to earning ratio on intrinsic value of share and earning quality.
- 4) Investigating the effects of other variables like size of the company in terms of earning quality.

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