The study of the effect of omitted variables on the results of earning rational pricing test and its components in TSE

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Abstract: The present study aimed to investigate the effect of omitted variables on the results of earning pricing test and its components in the companies listed in TSE. In the present study 341 companies were applied during 2002-2009. To investigate this issue, 6 hypotheses were used and by regression analysis by panel data and Mishkin test, they were studied. The results of the study showed that accounting earning is priced well without considering the variables of size and growth from the market. But by considering size and growth variables and earning persistence is not evaluated rationally. The results of accruals showed that without considering and by considering size and growth variables, the market has a true understanding of rational pricing of this variable and its understanding is based on expectations. In addition, the results of operating cash flow variable showed that without considering size and growth in valuation model, the market has true understanding of persistence of this variable but by considering size and growth variables, the market understanding of the persistence of this variable is not improved.

Introduction

Financial reports are important data resources for economical decisions and managers, investors, creditors and other users apply them to prove their information requirements (Ebrahimi Kordlar and Hassani Azardariani, 2006). One of the aims of financial reporting is summarizing information about financial performance of the business unit as periodical and earning plays an important role in measurement of companies' performance (Conceptual statement No. 1 of the board of financial accounting standards). Among the financial information being reported by enterprises, earning has a high position.

Stock market actors such as financial analysts and investors consider the earning reported by the companies. On the other hand the managers are inclined to fulfill the forecast of earning by stock market because their benefits depend upon the performance of stock price (Savu, 2006).

The present study investigated the persistence and earning pricing, free cash flow and accruals in Iran. In the study of accrual anomaly, Mishkin test (1983) was used. Some researchers as Kraft et al.(2007) believed that Mishkin test has the problem of omitted variables. In this study (size variables) assets logarithm (company growth), book value ratio to market value entered prediction and valuation equations to mitigate the problem of omitted variables in Mishkin test. By non-linear regression models, the mentioned variables entered the model and the asymmetrical effects in accruals anomaly were tested.

Theoretical basics

Earning is one of the main elements of financial statements being considered by the users and it is a criterion to evaluate the continuance of activity, efficiency and review of the structure of the contracts of the agents of economical units. Indeed, earning is a tool to overcome the measurement problems and the evaluation of the performance of the companies because cash flows has timing problems and they are not a good criterion for the performance of the companies. Despite this advantage, accrual earning based on the identification of income is not consistent with the real cash flows of the firm (Dechow and Dichev, 2002).

Based on the authority of management in managing the accruals, it is believed that accruals reduce the ability of earning to measure the performance of business unit. Some concepts of accounting as proving, objectivity and using evaluation models of historical fixed price, limit the authority of the management. These limitations restrict using wrong information to achieve the benefits. However, restricting the authorities, reduces the reported earning and the management can not disclose the specific information of business unit via the reported earnings (Dechow, 1994).

According to Dechow (1994) in stable firms (such as the companies with special requirements for the working capital cash, investment and financing), cash flow has a few timing and matching problems and it is a good criterion for measurement of the performance of economical unit but for the firms acting in an instable environment: encountering the changes of working capital cash of investment activities and financing, cash flow has a lot of timing and matching problems. Thus, the cash flow ability to reflect the firm performance is reduced by increasing the changes of working capital cash capital and investment activities and financing. It is expected that accruals solve timing and matching problems of cash flow. It is predicted that earning can better reflect the performance of changing firms than cash flow. In the industries with short-term operating cycle, using cash flow and earning has similar results but in the industries with long-term operating cycle, cash flow is not a good criterion for measurement of the result of the performance of firm.

Earning quality structures arise from the relation between cash components and earning accruals. One of the criteria of evaluation of earning quality is earning persistence. Earning persistence is the reliability of current earning. The more persistent the earning, the better the quality. The computation of accruals is done based on the predictions and estimations and it is measured by less reliability and they have low quality compared to cash components. The high persistence of the earning is due to its cash component (Dechow et al. 2008).

The study of the persistent earning was done for the first time by Bior et al. (1980) and empirically it was related to the value of securities. They applied persistent earning to forecast the future expected earning and they attempted to link the expected persistence earning to balanced model of securities.

Various studies are done regarding the persistence of various components of earning and they show that earning cash flows were more persistent than accruals. Sloan (1996) divided earning to cash components and accruals and believed that cash component was more persistent than accrual component but the investors had similar behavior to both components and capital market showed less reaction to the persistence of cash earning and showed high reaction to the persistence of accrual component. Zay (2001) divided accrual earning to normal and abnormal components and discovered similar results as Sloan (1996).

Review of literature

Sloan (1996) is the first researcher who believed that the investors price securities as they consider the information of accruals of cash flows (more for forecasting future earning) less (than real values) or mispricing is occurred. He found that by taking long-term investment in the stock of the companies with low accruals and taking short term investment in the stock of the companies with high accruals, the major future abnormal return is achieved. By Tamini portfolio test, he tested his predictions and achieved the predicted results but didn't control cash flow. Collins and Hribar (2000) stated that mispricing of accruals is different from the fluctuations of earning declaration.

Sloan (1996) showed that accruals were less persistent than cash flow to predict future earning and they presented some evidences that investors overestimated the persistence of accruals and the stocks with high accruals were priced with more error. The results of the study done by Sloan (1996) were supported by other researchers over the time. In the next articles, the researchers could replicate the results of Sloan in different time periods and with different definitions of accruals. In addition, the articles identified some components of the results of Sloan (1996) and attempted to explain the reason of creating abnormal accruals (Chen et al. 2006; Collins Hribar, 2000; Thomas and Zhang 2002, Chi, 2001).

Richardson et al (2001) evaluated the relation between accruals and stock return and found a negative relation between accruals and stock return. They also found that professional investors didn't consider the information of low quality of earning in their decisions. Thomas and Zhang (2002) believed that accrual anomaly is because of the inventory changes of the firms.

Bradshaw, Richardson and Sloan (2001) found that forecasts of the analysts earning didn't reflect negative correlation between high accruals and future earnings. Chi (2001) showed that accruals anomaly is due to mispricing of discretionary (abnormal) accruals.

Desai, Rajgopal, & Venkatachalam (2004) and Bior believed that accrual anomaly is a glamour. They showed that operating cash flow as traditional criteria of anomaly (e.g. book value ratios to stock market value and earning of price ratio) explained the mispricing of accruals. The ability of explaining of accruals to forecast the future returns is related to the explanatory ability of cash flow variable to forecast the future ret urn.

Dechow, Richardson and Sloan (2004) believed that investors forecast less persistence of accrual component of earning truly and if they have fixed view on total earning, the result was not like this and the difference of the persistence of cash component and accrual component is due to the subjective nature of accruals.

Lev and Nissim. (2006) find that the magnitude of the negative relation between accruals and future

abnormal returns has not declined over time. The results are considerable that accruals anomaly is well documented and the researchers are aware of this issue.

Hirshleifer, Hou and Teoh (2007) in the accrual anomaly: risk or mispricing found some results inconsistent with the idea that a rational pricing model can explain accrual anomaly and some evidences were provided to prove mispricing.

Hao (2009) in a study titled the effect of operating cycle on the persistence of accruals and mispricing of accruals evaluated that different persistence of accruals and their mispricing is due to different operating cycles and showed that long operating cycles affected the persistence of accruals and their mispricing and the results of his study showed that the firms with long operating cycle have less persistent accruals. The results were based on the result of the study of Sloan. This theory showed that different persistence of accruals created some errors in the estimation of accruals. In addition, the market efficiency test showed that mispricing of accruals for the companies with long operating cycles was more.

Method

The present study aimed to evaluate the persistence and earning pricing, operating cash flow and accruals in Iran. To study the accrual anomaly, Mishkin test (1983) is applied. Some researchers as Kraft et al. (2007) believed that Mishkin test has the problem of omitted variables. In the present study, dummy variables, company size, industry type, profitability and dividend payment entered prediction and valuation equations to mitigate the problem of omitted variables in Mishkin test.

The motivation of this study was the study of Krant et al. (2007) who believed that during the use of Mishkin test in the evaluation of accruals anomaly, omitted variables lead into misunderstanding of the model and the wrong results. They found that when the researchers perform the market efficiency test based on the pricing of earning components (e.g. operating cash flow and accruals), if some variables of prediction equation are excluded correlating with dependent variable and they are not priced rationally, Mishkin test (1983) has the problem of omitted variables. They recommended the researchers to use other related variables in using Mishkin test (1983).

To use the required variables, the study hypotheses were tested as following to show whether in accrual anomaly studies in Iran, Mishkin test (1983) is encountered with omitted variables or not?

Hypotheses

Hypothesis 1: Without considering size and growth variables, accounting earning is not priced rationally.
Hypothesis 2: Without considering size and growth variables, accruals are not priced rationally.

Hypothesis 3: Without considering size and growth variables, operating cash flow is not priced rationally.
Hypothesis 4: By considering size and growth variables, accounting earning is priced rationally.
Hypothesis 5: By considering size and growth variables, accruals are priced rationally.
Hypothesis 6: By considering size and growth variables, operating cash flow is priced rationally.

Study population

The study population of the present study is all the companies listed in TSE during 2002-2009. 457 companies, 3248 years-company. To determine the sample study, systematic elimination method was applied:

• At first, the companies whose fiscal year end was not 29 or 30 Esfand were excluded (103 companies, 544 year-company)

• Then, the financial institutions and banks and investment institutions (due to the different nature of their activity from other firms) were excluded (13 companies as 79 year-company).

• At the end of outliers (first percentile and 99th percentile of all the observations) were excluded finally (126 year-company)

By applying the above conditions, 341 companies (2499 year-company) were selected to estimate the models and study hypotheses.

Study models and operating definition of the variables

After the data collection and achieving convenient study population by the estimation of the following equations, the first hypothesis was tested:

$Earnings_{t+1} = \alpha 0 + \alpha 1 Earnings_t + v_{t+1}$

$R_{t+1} = \beta(Earnings_{t+1} - \alpha 0 - \alpha 1 * Earnings_t) + \varepsilon_{t+1}$

Where, earnings is accounting earning being homogenized with the stock market value of the beginning of the period. By Mishkin test (1983), earning coefficient equality is evaluated in both equations. Based on the first hypothesis, it is predicted that the mentioned coefficients had significant difference with each other.

For the second and third tests, the following equations are used:

Simultaneous equations system (2)

$Earnings_{t+1} = \gamma 0 + \gamma 1 ACC_t + \gamma 2 CFO_t + v_{t+1},$

$R_{t+1} = \beta(Earnings_{t+1} - \gamma 0 + \gamma 1 * ACC_t + \gamma 2 * CFO_t) + \varepsilon_{t+1}$

Where CFO is operating cash flow and ACC discretionary accruals and based on the second and third hypothesis, it is predicted that operating cash flow (accruals) of both equations was significantly different. Thus, Mishkin test is used.

To test the fourth hypothesis, the simultaneous equations system is estimated:

Simultaneous equations system (3)

Et+1 = γ0 + γ1ACCt + γ2CFOt + åγkSizeDecilet + vt+1

*Rt+1= β (Et+1 - γ0 - γ1*ACCt - γ2*CFOt + åγk *SizeDecilet) + εt+1*

Where *SizeDecile* (*BTMDecile)* is dummy variable in which when the company is in the class of big growth, value 1, otherwise zero is considered. In this study, companies based on size (growth) are classified into 5 groups. The size criterion, valuable logarithm of stock market and growth criterion is book value ratio to stock market value.

Based on hypothesis 5(6) of the study, it is predicted that operating cash flow coefficient (accruals) of prediction equation and valuation of the simultaneous equations system (3) didn't have significant difference.

Mishkin test

This test was presented for the first time in 1983 to investigate the rational pricing (some assumptions about market efficiency) in macro economy. In accounting, to investigate this issue that subjective expectations of the market of earning and its component (in stock price formation) is similar with the objective expectations of earning and its components (based on historical information), Mishkin test (1983) was applied.

Assume an explicit model of the expected return (a balanced pricing equation), the estimated parameters of this model is compared with the objective expectations of earning processing via historical data (e.g. cash flow, accruals). The latter equation is called prediction equation. If the estimated parameters in the equation have significant difference, it is inferred that subjective expectation of the market about earning is not rational because the mentioned parameters are different from the parameters of objective expectations based on predicted information.

In order to evaluate the market to market perception of persistence of accruals in prediction model, Mishkin approach (1983) is used being introduced by Sloan (1996) and it was applied by Dechow et al. If The market dedicates high evaluation coefficient to the applied weight of each of earning components of future earning, it is concluded that each of high (less) weight components are applied. The predicted pricing models and logical expectations of pricing models are estimated as following:

Forecasting model

Evaluation model

$$SAR_{i,t+1} = \delta(EARN_{i,t+1} - \beta^*_0 - \beta^*_1 ACC_{i,t} - \beta^*_2 CFO_{i,t}) + \varepsilon_{i,t+1}$$

Market efficiency to special items of earning imposes some constraints and its evaluation coefficient is equal to its counterpart coefficient in the prediction model (e.g. $\beta_1 = \beta^*_1$). The non-linear constraint requires that stock market rationally forecasts future earning of each of earning components of the current period. According to Mishkin (1983), we estimated forecast and evaluation model by simultaneous equations system and based on weighted non-linear least squares. The statistical test to Chi-square test is:

Where Q is the number of rational pricing constraints imposed

N is the number of observations in each equation.

SSR^c is the sum of squared residuals from the constrained system

SSR^u is the sum of squared residuals from the unconstrained system.

If the above ratio is big enough that its error level is less than acceptable error, the rational pricing of the earning components is rejected.

Data analysis

The descriptive statistics of the study

The descriptive statistics are including mean, median, max, min and standard deviation of the study are calculated and presented in Table (1). The mentioned values present a general view of the distribution of study data.

The results showed that return mean (2524.0), earning (1393.0), operating cash flow (0953.0), accruals (0440.0), company size (4064.12), its growth (5603.0). The median of the return (0691.0), earning (1100.0.0), operating cash flow (0740.0), accruals (0352.0), company size (2861.12) and its growth (4887.0).

Table 1: The descriptive statistics

Variables	Mean	Median	Max	Min	SD
RET	2524.0	0691.0	6991.4	7927.0	6807.0
EARNINGS	1393.0	1100.0	9791.0	4156.0	1596.0
CFO	0953.0	0740.0	7554.0	5656.0	1728.0
ACC	0440.0	0352.0	9390.0	5714.0	1495.0
SIZE	4064.12	2861.12	6875.12	7483.8	5319.1
BTM	5603.0	4887.0	5970.0	2020.9	7395.0
Variables definition: RET: stock return					

EARNING: Adjusted earning with the assets of beginning of period	
CFO: Adjusted cash flow with the assets of beginning of period	
ACC: Adjusted accruals with the assets of beginning of period	
SIZE: Company size equal to the logarithm of stock value of the market.	
BTM: The ratio of book value to stock market value of the company that is representing the company growth.	

The study hypotheses test

In this section, the result of study hypotheses test is presented.

The first hypothesis test

For testing first hypothesis, the simultaneous equations system (1) is estimated and then Mishkin test (1983) was applied. The results of estimation and the mentioned test are shown in Table (2).

Table 2: The results of system estimation of simultaneous equations (1)

Variables	Coefficient	Statistics z	Significance	Coefficient of determination
Forecasting equation				
Intercept	***0261.0	9856.5	000.0	71.48%
EARNINGS$_t$	***7025.0	3609.36	000.0	
b. Valuation equation				
EARNINGS$_{t+1}$	***4946.0	000.0	000.0	71.6%
Intercept	***1242.0	-5993.5	000.0	
EARNINGS$_t$	***6461.0	9127.8	000.0	
c. Mishkin test (1983)				
First hypothesis	5646.0(4524.0)			
***Significance at 1% level				

The estimation results of forecasting equation showed that intercept (0261.0) and earning variable coefficient of current period (7025.0) is significant at level 1%. The results showed that current period earning is about 49% of the changes of future period earning. The results of estimation of valuation equation showed that future period earning variables (4946.1) and current (6461.0) and intercept (1242.0) are significant at 1% level. The mentioned variables determine about 7% of future return changes.

The results of Mishkin test (1983) showed that current earning variable coefficient in forecasting equation (7025.0) and valuation equation (6461.0) didn't have significant difference. It means that without considering growth and size variables, the earning persistence is evaluated by market authorities as rationally. Thus, the first hypothesis is rejected.

Hypotheses 2, 3 test

To test hypotheses 2, 3, simultaneous equations system (2) was estimated and then Mishkin test (1983) was applied. The results of estimation and the test are presented in Table (3).

Table 3: The results of system estimation of simultaneous equations (2)

Variables	Coefficient	Statistics z	Significance	Coefficient of determination
Forecasting equation				
Intercept	***0260.0	1044.6	000.0	81.50%
CFO	***7706.0	1404.37	000.0	
ACC	***5644.0	8176.23	000.0	
b. valuation equation				
EARNINGS$_{t+1}$	***3682.1	7191.8	000.0	54.6%
Intercept	***1310.0	-1481.5	000.0	
CFO	***5551.0	1037.6	000.0	
ACC	***7281.0	1577.7	000.0	
c. Mishkin test (1983)				
Third hypothesis	**33585(0209.0)			
Second hypothesis	4553.2(1171.0)			
**, ***Significance at 5%, 1% level, respectively.				

The results of forecasting equation estimation showed that intercept (0260.0) and operating cash flow variables (7706.0) and accruals (5644.0) were significant at 1% level. The determination coefficient of the model was about 51%. The results of equation estimation of valuation showed that future earning coefficient (3682.1), intercept (-1310.0) and operating cash flow (7706.0) and accruals (5644.0) were significant at 1% level. The determination coefficient of the model was 6%.

The results of Mishkin test (3358.5) showed that operating cash flow coefficient in forecast and valuation equations had significant difference at 5% level. It means that without considering size and growth variables of the company, the capital market authorities didn't evaluate the persistence of operating cash flow truly. The third hypothesis is not rejected.

The results of Mishkin test (4553.2) showed that accruals coefficient in forecast and valuation equations didn't have significant difference. It means that without considering size and growth variables, the capital market evaluated the persistence of accruals truly. The second hypothesis is rejected.

Testing Hypothesis 4

To test hypothesis 4, simultaneous equations system (3) is estimated and Mishkin test (1983) was applied. Simultaneous equations system (3) is simultaneous equations systems (1) in which size and growth variables of the company (rank) are considered. The coefficients of control variables are not presented here due to the lack of special economical concept.

The results of forecasting equation estimation showed that intercept (0524.0) and earning variable coefficient of current period (6423.0) were significant at 1% level. The results showed that current period earning explained about 49% of the changes of future period earning. The results of the estimation of valuation equation showed that earning variables of future period (6927.1) and current (3606.0) were significant at 1% level and intercept (0763.0-) at significance level 5%. The mentioned variables with control variables determined about 12% of the changes of future return.

Table 4: The results of system estimation of simultaneous equations (3)

Variables	Coefficient	Statistics z	Significance	Coefficient of determination
Forecasting equation				
Intercept	***0524.0	0566.5	000.0	94.48%
EARNINGS$_t$	***6423.0	369631.28	000.0	
b. valuation equation				
EARNINGS$_{t+1}$	***6927.1	0914.11	000.0	
Intercept	**0763.0-	1207.2-	0339.0	04.12%
EARNINGS$_t$	***3606.0	6677.4	000.0	
c. Mishkin test (1983)				
Fourth hypothesis	2768.12(0005.0)			
**, ***Significance at 5%, 1% level, respectively.				

The results of Mishkin test (1983) showed that current earning variable in forecasting equation (6423.0) and evaluation equation (360.0) had significant difference at 1%. It means that when company size and growth enter simultaneous equations system, the earning persistence is not evaluated rationally by the market. The fourth hypothesis is rejected.

Testing Hypotheses 5, 6

To test hypotheses 5, 6, the simultaneous equations system (3) is estimated and Mishkin test (1983) is applied. The results of forecasting equation estimation showed that intercept (0390.0) and operating cash flow variables (7211.0) and accruals (5167.0) were significant at 1%. The determination coefficient of the model was about 51%. The results of valuation equation showed that future earning coefficient (5585.1), operating cash flow coefficient (2372.0) and accruals (4040.0) were significant at 1% and intercept (0646.0-) at 5% level.

Table 5: The results of system estimation of simultaneous equations (3)

Variables	Coefficient	Statistics z	Significance	Coefficient of determination
Forecasting equation				
Intercept	***0390.0	8565.3	0001.0	
CFO	***7211.0	4307.30	000.0	89.50%
ACC	***5167.0	0811.20	000.0	

b. valuation equation				
EARNINGS$_{t+1}$	***5585.1	7681.9	000.0	10.12%
Intercept	*0646.0-	6665.1-	0956.0	
CFO	**2372.0	3638.2	0181.0	
ACC	***4040.0	2307.4	000.0	
c. Mishkin test (1983)				
Sixth hypothesis	***0101.22(000.0)			
Fifth hypothesis	2986.1(2545.0)			
*,**, ***Significance at 10%, 5%, 1% level, respectively.				

The results of Mishkin test (0101.22) showed that operating cash flow in forecast and valuation equations had significant difference at 1% level. It means that by considering size and growth of company, the authorities of capital market didn't evaluate the persistence of operating cash flow truly and considering size and growth of the company didn't have any influence on the evaluations of ca pit al market authorities. Thus, the sixth hypothesis is rejected.

Also, the results of Mishkin test (2986.2) showed that accruals coefficient in forecast and valuation didn't have significant difference. It means that by controlling the company size and growth, the capital market authorities evaluated the persistence of accruals truly, thus, the fifth hypothesis is not rejected.

Conclusion

One of the features of the researchers of economical-social sciences is the relative results in various time conditions. One of the most important issues in micro economy is optimized assignment of financial resources to economical enterprises. Such assignment requirement is rational decisions by the existing information. One of the most important information resources of decisions makers is financial information as financial statements. It should be considered that accounting information interpretation requires the evaluation of their quality. It is possible that accounting information less than expected (more than expected) is relied and based on such interpretation, some decisions are taken. In the present study, the effect of omitted variables on the results of earning rational pricing test and its components in TSE is evaluated. It is expected that the results can obtain information regarding the evaluation of decision makers in the market based on the accounting earning information and its components. The results of the study showed that accounting earning variable without considering size and growth variables and without considering from the market are truly priced. But by considering size and growth variables, earning persistence it is not evaluated rationally by the market. The results of accruals variables showed that without considering

and by considering the size and growth variables, the market has true perception of valuation (pricing) of this variable and its perception is based on expectations. In addition, the results of operating cash flow showed that without considering size and growth variables in valuation model, the market has true perception of the persistence of this variable. But by considering size and growth variables, the market perception of the persistence of this variable is not improved.

Research recommendations

Based on the study, the following recommendations are stated to improve the existing condition and the future studies.

Applied recommendations

Based on the result, some of the recommendations are as following:

• It is recommended to investment in TSE to consider earning persistence and its components and consider in the decisions. Because one of the most important data in the market is the accounting earning and it is required to consider more in using this variable in decisions models.

• It is recommended to the managers of the companies to attempt more in clarity of the information regarding their strategies and its effects on public activities of the company in the market and attempt to attract the attention of the market.

Recommendation for future studies

In the present study, earning anomaly and its components was done in all the sample companies and there was no comparison. The researchers can investigate the comparative topics as:

The study of earning anomaly and its components in growth and non-growth companies

The study of earning anomaly and its components in broke and non-broke companies (critical and non-critical condition) The study of the effect of risk with financial crises (broke) on earning anomaly and its components.

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