Investigation of the Influence of Accruals Profit on Prediction of Future Operational Profit

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Abstract: One of the main targets of an auditing system is provision of useful information for prediction of economic events. In this regard, profit prediction is of great special importance because it affects users' decision-making and judgments. Therefore, a large number of studies deal with prediction of accounting profit and precision of methods which are used for prediction of profit. Therefore, the present research deals with relationship between variations in accruals and operational profit and future period operational cash flows in pharmaceutical-producing companies admitted to Tehran Stock Exchange in a 4 years period of time (2009-2012). Considering the results of the first hypothesis, it can be said that there is a positive relationship between variations in accruals and operational profit of future period. Therefore, the first hypothesis is supported. These results are consistent with the results of studies conducted by Modares and Abbaszadeh, Kordestani, Gholam Reza, Saedmohamadi, Kasra. Furthermore, the results of the second hypothesis test revealed that there is a positive relationship between variations in accruals and future period operational cash flows. Therefore, the second hypothesis is supported. These results are consistent with the results of studies conducted by Sadegh Byan, Mohsen, Arab-Mazar, Mohammad, Hashemi, Seyyed Abbas.

Key words: Accruals, operational profit, operational cash flows, Tehran Stock Exchange, profit

INTRODUCTION

Different surveys conducted on investors and financial analysts revealed that although cash circulation information is used for investment analysis but profitability information which is based on accrual accounting has some advantages over cash circulation. Further, the fact that accruals improve the capability of profit in evaluating corporate performance is also verified by FASB.

Some valid and common models which are used for valuation of securities are based upon discount of future cash flows. Fischer valuation model and also Capital Assets Pricing Model (CAPM) which are among the main pricing models emphasize on this matter. Naturally, these models require estimation of future cash flows. Moreover, profit is considered as the result of accounting process and includes two elements: cash and accrual. It can be depicted as follows:

Net profit = Operational cash flows-Accruals

Accruals include adjustments resulted from use of two principles of compliance and commitment of income in registering transactions and events, investigation of the fact that whether these items can have information content for prediction of profit or cash flows of future period is the subject of this study.

Dechow (1994) conducted a study titled, "Accounting Profit and Cash Flows as Criteria for Evaluation of Corporate Performance with Emphasis on the Role of accruals". He investigated the advantages and capabilities of profit in reflecting corporate performance and features of accruals in playing role. The results of this research show that one of the roles of accruals in accounting is improvement of criteria for evaluation and measurement of corporate performance and provision of information for predicting of future cash flows.

Dechow *et al.* (1998) conducted a study to investigate relationship between profit and cash flows. They emphasized that accounting profit is preferred to current operational cash flows in prediction of future operational cash flows. This emphasizes on the importance of accruals in prediction of future cash flows. Finger (1994) conducted a research titled, "Power of Profitability in Prediction of Cash Flows". He examined advantages of profit in prediction of future investment earnings, operational profit and operational cash flows. He revealed that profit is a significant variable in prediction of profit for about 88% of investigated

companies. Furthermore, profit along with cash flows is a significant variable (are significant variables) for prediction of cash flows in 90% of sample companies.

In a study conducted by Fair-Field *et al.* (1996), the researchers tried to test and evaluate the influence of profit elements report in prediction of profit. The results of the research showed that separation and differentiation of special items from continuous operational profit and non-operational profit from operational profit can improve profit prediction.

Research hypotheses: Since, one of the main targets of financial reporting is revealing different aspects of profitability power of the profit-making unit it seems that concentration on the role of accruals of profit as the differentiating aspect of accounting profit and operational cash flows can be useful in prediction of operational profit and operational cash flows. Therefore, the fact that accruals possibly improve prediction of operational profit and future cash flows is the core subject of the present study and the research hypotheses are as follows:

- First hypothesis: there is a positive relationship between variations in profit accruals and operational profit of future period
- Second hypothesis: there is a positive relationship between variations in profit accruals and operational cash flows of future period

Definition of variables
Accruals: Accruals in this research can be depicted as follows:

Accruals = Operational profit-Net operational cash flows

For determination of accruals, we used items of comparison of operational income with operational cash flow as independent variable in order to predict profitability and operational cash flows.

Operational income: Operational income is an amount which is resulted from subtraction of sold product price and other operational costs from income or operational income. In this study, it is a dependent variable and we investigate the influence of accruals of profit (independent variable) on it.

Operational cash flows: By operational cash flow in this research we mean operational cash flows based on Iranian Standards which are presented in the first section of cash flow circulation statement.

MATERIALS AND METHODS

In terms of the time features of the gathered data, it is a cross-sectional research. In terms of data analysis, it is a correlation study. Therefore, this is a correlation cross-sectional study. After calculation of independent and dependent variables primary process of data using Excel Software, the hypotheses are tested by means of regression analysis and using SPSS Software.

Descriptive statistics: In descriptive statistics, the following indices are studied: as it can be seen in Table 1, mean value, median, SD, minimum and maximum values of cash flows resulted from operational activities are equal to 0.0791, 0.1381, 0.4031, 0.005 and 0.524, respectively. Since, median of net value of cash flows resulted from operational activates is slightly greater than net mean value of cash flows resulted from operational activities, distribution of net operational cash flows in the statistical sample is skewed to left.

Mean value, median, SD, minimum and maximum value of accruals are equal to 0.154, 0.115, 0.431, 0.102, 0.522, respectively. Since, mean value of accruals is slightly greater than median of accruals, distribution of accruals in statistical sample is skewed to right.

Mean value, median, SD, minimum and maximum values of profit after tax and before unprecedented items and stoppage operation are equal to 0.321, 0.243, 0.543, 0.187 and 0.765. Since, mean value of profit after tax subtraction and before unprecedented items and stoppage operation is slightly greater than its median, its distribution in statistical sample is skewed to right.

Mean value, median, SD, minimum and maximum operational profit are equal to 0.138, 0.115, 0.112, 0.109, and 0.863, respectively. Since, mean value of operational profit is slightly greater than its median, distribution of operational profit in sample is skewed to right.

Statistical methods: Statistical hypothesis for testing significance of a correlation coefficient is as follows:

Table 1: Descriptive statistics of research

Variables description	Mean	Median	SD	Min.	Max.
Cash flow of operations (CFO)	0.0791	0.138	0.403	0.005	0.524
Accruals (ACC)	0.1540	0.115	0.431	0.102	0.522
Profit after subtraction of tax and before unprecedented items and sopped operations (EARN)	0.3210	0.243	0.543	0.187	0.765
Operational profit (Operational income)	0.1380	0.115	0.112	0.109	0.893

$$\begin{cases} H_0: \rho = 0 \\ H_1: \rho \neq 0 \end{cases}$$

Test statistic for investigation of accuracy of this hypothesis is as follows:

$$T = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \sim t_{n-2,\ 1-\alpha/2}$$

If $|T| > t_{n-2,\ 1-\alpha/2}$, then H_0 which deals with absence of relationship between the two variables is rejected. And if $|T| < t_{n-2,\ 1-\alpha/2}$, then H_0 which deals with absence of relationship between the two variables cannot be rejected. In a regression bi-variable model as follows:

$$Y_t = \beta_0 + \beta_1 X_t + \varepsilon_t$$

Significance tests of coefficients are:

$$\begin{cases} H_0: \beta_0 = 0 \\ H_1: \beta_0 \neq 0 \end{cases} \text{ and } \begin{cases} H_0: \beta_1 = 0 \\ H_1: \beta_1 \neq 0 \end{cases}$$

which are tested by means of the following statistics:

$$T = \frac{\hat{\beta}_0}{SE(\hat{\beta}_0)} \sim t_{1,\ 1-\alpha/2}, \ T = \frac{\hat{\beta}_1}{SE(\hat{\beta}_1)} \sim t_{1,\ 1-\alpha/2}$$

In order to make decision on supporting or rejecting H_0 hypotheses, we go as follows:

- If $|T| > t_{1,\ 1-\alpha/2}$, then H_0 is rejected
- If $|T| < t_{1,\ 1-\alpha/2}$, then H_0 is not rejected

Furthermore, we can use probability value for making decisions. If probability value (Sig.) is greater than or equal to 0.05, H_0 is supported and if its value is smaller than 0.05, H_0 is rejected.

In order to investigate normality which is a precondition for t-test, we used Kolmogrov-Smearnov test. It is defined as follows:

$$D_n = SUP|F_n(x) - F(x)|$$

Where:
F(x) = Expected distribution for observations
$F_n(x)$ = Empirical distribution of observations

Explanation: Assume variables $X_1, X_2, ..., X_n$ comprise a random sample of continuous distribution of F(x) and $X_{(1)}, X_{(2)}, ..., X_{(n)}$ and are ordinal statistics for this sample. Empirical distribution for this random sample is in fact a $F_n(x)$ statistic which is defined as follows:

$$F_n(x) = \begin{cases} 0 & x < X_{(1)} \\ \dfrac{k}{n} & X(k) < x < X_{(k+1)} \\ 1 & x > X_{(n)} \end{cases}$$

$$k = 1, 2, ..., n-1$$

In order to make decision on rejection or acceptance of normality, we used probability value. If probability value (Sig.) is greater or equal to 0.05, normality H_0 is supported and if its value is smaller than 0.05, normality H_0 is rejected.

Steps for investigation of statistical hypotheses
Investigation of correlation coefficient between independent and dependent variables and significance of coefficients: In this stage, Pearson correlation coefficient between independent and dependent variables are calculated and relationship type (direct or reverse) is depicted by correlation coefficient sign. Furthermore, their significance is investigated by probability value. Probability values smaller than 0.05 indicate significance relationship.

Regression model fit: In this stage, the fitted model of determination coefficient is calculated and significance test independent variable is conducted $H_0: \beta_1 = 0$ (models used for investigation of research hypotheses are as follows in which ACC is independent variable and CFO and OP are dependent variables:

$$OP_{it} = \beta_0 + \beta_1 ACC_{it} + \varepsilon_{it}$$

Where:
OP = Operational profit
ACC = Accruals

$$CFO_{it} = \beta_0 + \beta_1 ACC_{it} + \varepsilon_{it}$$

Where:
CFO = Operational cash flow
ACC = Accruals

We used Kolmogrov-Smearnov test in order to investigate normality. If probability value of this test is greater than 0.05, it can be said with 95% of certainty that normality of remainders is supported.

In order to investigate independence of remainders, we used Durbin-Watson and Runs tests. If Durbin-Watson statistic is close to 2, we can accept independence of remainders. Further, if probability value of Runs test is greater than 0.05, independence of remainders is verified by 95% of certainty.

Table 2: Regression models for each hypothesis

Hypothesis	Regression equation
First	Operational income$_{t+1}$ = b_0+b_1 ΔACC_{t+1}+ $b_2\Delta ACC_{t+2}$+b_3 ΔACC_{t+3}+ε
Second	CFO_{t+1} = b_0+b_1 ΔACC_{t+1}+b_2 ΔACC_{t+2}+ $b_3\Delta ACC_{t+3}$+ε

Determination of an appropriate model for estimation of regression model: When investigation of relationship between one dependent variable and several independent variables is intended and researcher aims to estimate a parameter (or parameters) for independent variable (variables) based on this relationship and wants to predict by presenting a model, data and variables of the model can be in three different types:

- Time series data
- Cross sectional data
- Pooling data

Time series data, it measures values of variable (several variables) in successive points in time. This succession can be annual, monthly, quarterly, weekly or even continuous.

Cross-sectional data, this measures values of a variable (several variables) in time and on numerous measurement units. These units can be production units, industries or different companies.

Pooling data in fact state cross-sectional data in time. In other words, these data are resulted from combination of two sets of time series and cross-sectional data.

Considering the existing literature and nature of the research hypotheses, we used pooling data in this study. We used Chaw and Hassman tests in order to determine an appropriate model (panel or pool with fixed or random impacts) for testing the hypotheses. It must be mentioned that we used two regression models depicted in Table 2 for testing the hypotheses.

RESULTS AND DISCUSSION

Research hypotheses tests:
- First hypothesis: there is a positive relationship between variations in accruals and operational profit of future period

After testing regression assumptions and making sure of them, the results of fitting regression equation for all accruals have been mentioned in Table 3 F-statistic (11.276) also indicates significance of the whole regression model. As it can be seen in the bottom of Table 3 determination coefficient and adjusted

Table 3: Results of fitting first regression equation

Operational income$_{t+1}$ = b_0+b_1 ΔACC_{t+1}+b_2 ΔACC_{t+2}+b_3 ΔACC_{t+3}+ε

Variables	Variable coefficient	Coefficient value	t-statistic	Sig.
Constant	b_0	0/522	2/873	0/026
ΔACR_{t+1}	b_1	1/234	5/073	0/000
ΔCR_{t+2}	b_2	0/467	3/838	1/000
ΔACR_{t+3}	b_3	0/641	2/588	0/038

Determination coefficient = 0/741; F-statistic = 11/276; Adjusted determination coefficient = 0/688; Sig. p-value =0/000; Durbin-Watson statistic = 1/925

Table 4: Results of fitting second regression model

Operational income$_{t+1}$ = b_0+b_1 ΔACC_{t+1}+b_2 ΔACC_{t+2}+b_3 ΔACC_{t+3}+ε

Variables	Variable coefficient	Coefficient value	t-statistic	Sig.
Constant	b_0	672/0	7/832	000/0
ΔACR_{t+1}	b_1	1/051	4/034	0/003
ΔACR_{t+2}	b_2	0/913	2/761	0/021
ΔACR_{t+3}	b_3	0/719	2/037	0/049

Determination coefficient = 0/627; F-statistic = 9/162; Adjusted determination coefficient = 0/598; Sig p-value = 0/000; Durbin-Watson statistic = 2/021

determination coefficient of the above model are equal to 74.1 and 68.8%, respectively. Therefore, it can be concluded that in the aforementioned regression equation, only 68.8% of future operational profit of the investigated companies can be explained and predicted by independent variables.

First hypothesis test result: If Sig. value calculated by software is smaller than the considered certainty level (equal to 5% in this research), the significance of the intended variable is supported and its corresponding hypothesis is verified. Furthermore, considering t-statistic, if this statistic is greater than its equivalent value in t-student test with the very certainty level (5%), its corresponding hypothesis is supported. Considering the information listed in Table 3 it can be said that all variables in the above equation are significant in 95% certainty level. On the other hand, considering the positive sign of coefficients of variables, it can be said that there is a positive relationship between variations of accruals and operational profit of future period. Therefore, the first hypothesis is supported.

Second hypothesis test:
- Second hypothesis: there is a positive relationship between variations in accruals and future period operational cash flows

After testing regression assumptions and making sure of them, the results of fitting regression equation have been presented in Table 4 F-statistic value (9.612)

indicates total significance of regression model. As it can be seen in the bottom part of Table 4, determination coefficient and adjusted determination coefficient of the above model are equal to 62.7 and 59.8%, respectively. Therefore, it can be concluded that in the aforementioned regression equation, only 59.8% of variations in cash flows resulted from future operations are explained and predicted by aforementioned independent variables.

Second hypothesis test result: If sig value calculated by software is smaller than the considered certainty level (equal to 5% in this research), the significance of the intended variable is supported and its corresponding hypothesis is verified. Furthermore, considering t-statistic, if this statistic is greater than its equivalent value in t student test with the very certainty level (5%), its corresponding hypothesis is supported. Considering the information listed in Table 4, it can be said that all variables in the above equation are significant in 95% certainty level. Moreover, considering the positive sign of coefficients of variables, it can be said that there is a positive relationship between variations of accruals and operational profit of future period. Therefore, the second hypothesis is supported.

CONCLUSION

Furthermore, division of profit into elements like operational profit, non-operational profit, income tax, special items, unprecedented items and stoppage operation can increase predicting power of profit.

RECOMMENDATIONS

The following recommendations are made based on research results. Because the results showed that there is a positive relationship between variations of accruals and operational profit of future period, investors and analysts are recommended to use accruals information when predicting future operational profit in their decisions.

Since, the results showed that there is a positive relationship between variations in accruals ad future operational cash flows, investors and analysts are recommended to use accruals when making decisions on future operational cash flows.

Since, the results revealed the usefulness of financial information of previous three years in prediction of future operational cash flows and future operational profit, companies are proposed to mention profit, cash flows and accruals of previous periods as well as trends of these items in 4 years' time periods, i.e., the report period and previous 3 years report such that users of financial statements and historical reports can use more appropriate time series in estimations of statistical models.

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