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Full Length Research Paper

Evaluation of accrual quality on the basis of accrual balance

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This paper is aimed to assess the relationship between accrual quality balance and accrual quality. Since accrual quality is not directly observable, in the present paper, accrual quality balance (AQB) has been used as a representative of accrual quality. Then the resultant standard deviation from this model has been applied as a dependent variable in another model, and the relationship between this variable with four accrual quality balances have been studied. For the purpose of this study, 71 listed companies in Tehran Stock Exchange, during 2005 to 2009, have been randomly selected and studied. Formulated hypotheses have been tested using a combination of sectional and time-series data, and the software econometric views, (EVIEWS) has been applied to analyze the results. The results have confirmed the relationship between end-year accrual balances and accrual quality; the positive sign for the following coefficients, business accounts and notes receivable, stock, business accounts and notes payable, means that the relationship between end-year accrual balances with accrual quality is a direct relationship.

Key words: Accrual quality, accrual balances.

INTRODUCTION

Accounting income, and also its components, is considered as one of the important factors in computing tax, dividend policy, consulting for better investment and appropriate decision making. Adopting accrual basis for computing accounting income, it can be claimed that accounting income is composed of two parts: cash and accrual. Financial Accounting Standard Boards (FASB) believe that, comparing to operational cash flows, providing information about income and its components is a better index for predicting future cash flows. Accrual is one of the most essential components in reporting accounting income because accrual are based on estimations, and in the case of making mistake in estimation, future accruals and future income should be amended.

In this study, accrual quality has been considered as equivalent to accounting income because whenever accrual quality is high, earning will be of high quality (Thai, 2004).

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The main objective of this paper is proposing an appropriate model for assessing accrual quality via applying end-year accrual balances.

LITERATURE REVIEW

In the study conducted about accruals, Dekow has concluded that it is more useful to use accruals for performance evaluation of companies (Dekow, 1997).

In another study, Dekow et al. (2003) have assessed the importance of accruals in better measurement of firm performance. In the study, they have shown since accruals require relevant information and prediction about future cash flows, increased prediction error about accruals would decline accrual quality and, also quality of earning (Dekow et al., 2003).

Louis and Robinson (2005) in their research on accruals have confirmed that managers attempt to manage earnings using accruals in order to maximize their rewards.

Kumar and Krishna (2008) have examined the role of investment opportunities as a determinant factor in

relevance of accruals and operational cash flows for performance evaluation. They found that when there is very few investment opportunities, relevance of operational cash flows will gradually improve as the investment opportunities grow; on the other hand, in the case that there is a high extent of investment opportunities, the relevance of accruals would decrease along with increased investment opportunities. Consequently, the relevance of income will be changed, at first, in the direction of investment opportunities, and then, in the opposite way (Kumar and Krishna, 2008).

In a study carried out by Barth et al. (2001), it is found that segregation of earnings either into two components, namely, accruals and cash flows, or into five components as cash flows and four accrual components, causes the average of prediction error decreases and, as a result, this could help in predicting firm value (Barth et al., 2001).

Abdolghany has investigated the measurement of quality of earning; he found that different methodologies will lead to different evaluation; therefore, just based on a single method, it may not consider an industry or a company having high or poor quality of earning. Hence, he has suggested that, prior to make investment decision, stakeholders should choose and apply more than one method for evaluating the quality of earning (Abdelghany, 2005).

In their study, Dechow and Ross have compared persistence of earning in terms of balance sheet approach and income statement approach and shown that the persistence of earning is subject to the extent and the sign of accruals. Accruals could enhance the persistence of earning in respect of cash flows with high accruals, but this is not the case for the firms with low extent of accruals; in these firms, the persistence of earning would decline (Dechow and Ross, 2005).

In another research, Zang has confirmed that if a company, in the past, has applied more accruals comparing to other firms in the industry, it will have lower flexibility for management of accruals. As a result, such companies have stronger tendency to manipulate earning through activities of company (Zang, 2003).

Ghaemi et al. (2009) have studied the relationship between quality of earning via accruals and its components with normal and abnormal return of stocks in Tehran Stock Exchange. In their study, it was revealed that the return of stocks is subject to the extent of accruals and its relevant constituents in the firm (Ghaemi et al., 2009).

Arabmazar et al. (2005) have examined increasing and relative information content of earning, operational cash flows and accruals in Iran Capital Market. Their findings suggest that earning is of higher information content as compared to operational cash flows. The surveys in the study have revealed the increasing information content of accruals comparing to operational cash flows. Also, information content of discretionary accruals is richer than non- discretionary ones (Arabmazar et al., 2005).

MODELS AND STATISTICAL METHOD

This present study examines the relationship between accrual balances and accrual quality; for the purposes of this study, the balances of accruals have been respectively considered as follows: account receivables, account payables, inventory and pre-tax operational income. The studies statistical universe in this study is comprised of selected companies listed in Tehran Stock Exchange during 2005 to 2009 satisfying the following criteria:

1) The firms should be listed in stock exchange before 2005. This criterion has been considered in order to have equal number of statistical sample in the years under examination;
2) To have comparable items, the fiscal end-year should be 16th March (the date is the last day of the year in Iranian calendar);
3) The studied firms should not either stop their operation or change their fiscal year during afore-mentioned period;
4) They should not be categorized as financial investment or financial intermediary (dealer) institutions;
5) Based on Iranian Accounting Standards, during the period, the firms should provide and present cash flow statements with five sections.

Considering these criteria, the statistical sample for present study has totally comprised of 123 manufacturing – business firms listed in Tehran Stock Exchange. For the purposes of sampling, simple – random method has been used so that all firms in the statistical sample were numbered from 1 to N, and finally, 76 firms were selected randomly. Because of not presenting complete information, five firms have been eliminated from our study. Lastly, the number of firms in the sample reached to 71.

In the present study, dependent variable is accrual quality of capital on turn for selected companies. Since accrual quality is not objective (not directly observable), standard deviation of balances from the first model has been used as the proxy of accrual quality. In the other words, standard deviation of the first model has been considered as dependent variable in the second model.

The first model showing operational cash flows at time *t+1*, is defined as follows:

$$cfo_{it+1} = \alpha_{i0} + \alpha_{i1} AR_{it} + \alpha_{i2} InvAccr_{it} + \alpha_{i3} AccExp_{it} + \alpha_{i4} cpcF_{it+1} + \alpha_{i5} DEF_{it+1} + \varepsilon_{it}$$

where: cfo_{t+1} is operational cash flows at time *t+1* as dependent variable.

Also, the model of independent variables has been expressed as follows:

AR_t, $InvAccr_t$, $AccExp_t$ are net balance of accounts receivables a time t, inventory accrual at

Table 1. The results of F test and Hausman test.

Test	Statistic	Degree of Freedom	Significance
F Test	14.1	(70.204)	≤0.0001
Hausman test	174.46	5	≤0.0001

Table 2. Indices of primary regression model with fixed effects method.

Primary model (fixed effects)	Coefficient of determination	Adjusted coefficient of determination	F	Significance	Statistic Durbin-Watson
	0.91	0.88	27.43	≤0.0001	2.78

the time t and accrued expenditures at the time t, respectively. $cpcF_{t+1}$ represents cash flows related to current income at the time t+1. DEF_{t+1} is the components of deferred accounts at time t+1 calculating as end-year balance of other assets plus deferred inventories. ε is error term which is an out of control variable representing other affecting factors on dependent variable; it may not to consider these factors in our model due to various reasons, and *i* represents the firm under examination; in the present study, exactly, 71 firms have been studied.

Model 2: the general definition of this model, in which accrual quality is a function of end-year balances of accruals, has been expressed as follows:

$$AQ = \alpha_1 + \alpha_2 ARS + \alpha_3 MGB + \alpha_4 APS + \alpha_5 PBT + \varepsilon$$

AQ is accrual quality. ARS and MGB represent accounts and notes receivable (ARS) and material and goods balances (MGB), respectively. APS and PBT are representatives of business accounts (APS) and notes payable and profit before taxes, respectively (PBT). And means coefficients of variables which should be measured.

Test F: Testing the significance of group (selection among common effects and fixed effects).

The first step to estimate such models is to test significance of the group (cross-sections) or, in other words, to choose methodology of estimating model between two methods, namely, common effects and fixed effects. The test is known as F test. Table 1 presents the results of F test. As it is clear, estimated probability for this test is less than 0.05. Therefore, it is preferred to estimate this model thorough either fixed effect method or random effect one. The process of distinguishing between these two methodologies and selecting the preferred one would be conducted by Hausman test. In fact, Hausman test is one of the tests applied in studies with such models as fixed and random effects. As it is shown in Table 1, estimated probability value for Hausman test is less than 0.05. To put it differently, it is concluded that fixed effect model is preferable to random effect model.

Estimation of the primary model

Based on the results of the test hitherto, Model 1 should be estimated thoroughly fixed effect method in sections. Yet, it is necessary to note that researchers sometimes estimate their model through all three models, and then, compare the results of each model with the other ones. Also, in the present study, notwithstanding the results of afore-mentioned tests, the proposed model has been estimated via all three models. Table 2 shows the results of Model 1. However, like some researchers, notwithstanding having significant group suggesting fixed effect method in order to estimate the model, in this study, Model 1 has been estimated through three methods, namely, common effect, fixed effect, and random effect; the results of these three tests are presented in Table 2. Respecting the results of these tests, common effect model, in which time-series of each section have been aggregated or limited to produce a new time series, has showed better results than the other two models. However, it is important to note that the sign of coefficient of independent variable, on which research hypothesis is based, is similar in all three methods. Model 1 is expressed as follows:

$$cfo_{it+1} = \alpha_{i0} + \alpha_{i1} AR_{it} + \alpha_{i2} InvAccr_{it} + \alpha_{i3} AccExp_{it} + \alpha_{i4} cpcF_{it+1} + \alpha_{i5} DEF_{it+1} + \varepsilon_{it}$$

Table 3. Primary regression coefficients with fixed effect method.

Primary model (fixed effect)	Coefficient		t	Significance
	B	Standard error of estimate		
Constant	233331.60	115742.30	2.02	0.045
AR_t	-0.61	0.13	-4.64	≤0.0001
$InvAccr_t$	-0.08	0.08	-1.05	0.293
$AccExp_t$	-0.27	0.13	-2.10	0.037
$CpcF_{t+1}$	0.06	0.04	1.77	0.079
DEF_{t+1}	0.42	0.09	4.73	≤0.0001

Table 4. Indices of primary regression model with random effects method.

Primary model (random effects)	R square	Adjusted R square	F	Significance	Statistic Durbin-Watson
	0.78	0.78	196.30	≤0.0001	1.59

Table 5. Primary regression coefficients with random effect method.

Primary model (random effect)	Coefficient		t	Significance
	B	Standard error of estimate		
Constant	13305.01	52906.46	0.25	0.80
AR_t	0.29	0.08	3.68	≤0.0001
$InvAccr_t$	-0.37	0.04	-8.60	≤0.0001
$AccExp_t$	-0.65	0.10	-6.54	≤0.0001
$CpcF_{t+1}$	0.14	0.03	4.66	≤0.0001
DEF_{t+1}	0.53	0.04	14.11	≤0.0001

Tables 2 and 3 show the results of primary model via fixed effects method. The results of primary model with random effect are presented in Tables 4 and 5.

Respecting the results of these tests, common effect model in which time-series of each section have been aggregated or limited to produce a new time series has showed better results as compared with those two. However, it is important to note that the sign of coefficient of independent variable on the basis of which research hypothesis has been formulated is similar in all three methods.

Adjusted coefficient of determination

As it is clear from Table 6, coefficient of determination is about 79% showing percentage of the differences between dependent variable and independent variables.

General significance of model and coefficients of independent variables

In this study, statistic F has been used in order to test general significance of independent variables that is to test the significance of foregoing variables in total. As it is shown in Table 6, since probability for this test is less than 0.05, H_0 stating that all coefficients of the model are zero and the model is not significant in general has been rejected. Also, statistic t has been used to assess significance of coefficients of each independent variable. In Table 7, it is observed that estimated statistic t for all independent variables in our model is greater than critical value in the table (1.96) and, therefore, these variables are significant at the level of 0.95.

Durbin-Watson test

Regarding Durbin-Watson statistics, it could not be postulated for this model that there is a correlation between the residuals in the model. However, in regression models, having low and weak correlation is normal and venial because this will not arise any problems in estimating coefficients.

Estimation of final model

In order to test research hypothesis stating that there is

Table 6. Indices of primary regression model with common effects method.

Primary model (common effects)	R square	Adjusted R square	F	Significance	Durbin-Watson
	0.80	0.79	218.13	≤0.0001	1.65

Table 7. Primary regression coefficients with common effect method.

Primary model (common effect)	Coefficient		t	Significance
	B	Standard error of estimate		
Constant	21826.49	50544.35	0.43	0.666
AR	0.22	0.07	3.02	0.003
InvAccr	-0.33	0.04	-8.00	≤0.0001
AccExp	-0.65	0.09	-6.95	≤0.0001
$CpcF_{t+1}$	0.12	0.03	4.24	≤0.0001
DEF_{t+1}	0.52	0.04	14.09	≤0.0001

Table 8. Indices of final regression model.

Model	R square	Adjusted R square	F	Significance	Durbin-Watson
	0.902	0.896	151.24	≤0.0001	2.18

direct relationship between end-year balances of accruals and accrual quality, standard deviation of the residuals in afore-mentioned model have been used as proxy of accrual quality. In other words, standard deviations of afore-mentioned model have been used as dependent variable in second model. Generally, the final model in which accrual quality is a function of end-year balances of accruals would be described as follows:

$$AQ = \alpha_1 + \alpha_2 ARS + \alpha_3 MGB + \alpha_4 APS + \alpha_5 PBT + \varepsilon$$

Tables 8 and 9 present the results of final model.

As shown in Table 9, ARS is not significantly correlated with dependent variable (respective t is lower than 1.645), but the other three, MGB, APS, and PBT, have significant and direct correlation with dependent variable (t is less than 1.645 for all these variables). The coefficients of these variables show that APS, MGB, and PBT have the most effects on dependent variable (accrual quality), respectively.

Assessment of the model

Coefficient of determination

The first measure for assessing econometric models is evaluation of coefficient of determination (R). As shown in Table 8, R estimated studying data from 71 firms, is about 90%. In other words, the model proposed here explains 905 of variations on dependent variable.

General significance of the model

Table 8 shows the results of estimating the model. Statistic F has been used for testing general significance of the variables. Since p-value, in this test, is lower than 0.05 (*p-value*≤0.0001) H_0 stating that all coefficients will be zero and, therefore, the model is not generally significant.

Normality of residuals

In normal distributions, skewness is zero. Here, as skewness is -0.54, it could be said that the distribution under examination is normal.

In the cases that the distribution is skewed, but not in high level, if the number of data is more than 30 items, the results of regression model is of acceptable validity.

Hypothesis tests

In order to test the first minor hypothesis stating that a direct relationship exists between ARS and accrual

Table 9. Final regression coefficients.

Model	Coefficients (β)		t	Significance
	B	Standard error of estimate		
Constant	4758.16	21013.63	0.23	0.822
AR	0.05	0.05	0.89	0.377
MGB	0.18	0.05	3.54	0.001
APS	0.44	0.08	5.22	≤0.0001
PBT	0.07	0.02	3.05	0.003

quality, statistic t for the variable ARS has been evaluated. Based on the information in Table 9, t is lower than 1.645 (t= 0.89) and, hence, the coefficient of this variable is not statistically significant. Therefore, H_0 stating there is not a direct relationship between ARS and AQ (accrual quality) could not be rejected based on the findings of the present study; so it may not be asserted that this hypothesis (the first minor hypothesis) is certifiable. Testing the second minor hypothesis, which posit a direct relationship exists between MGB and AQ, t statistic for MGB has been examined. On the basis of results presented in Table 9, t is greater than 1.645 (t= 3.54); so the coefficient of this variable is statistically significant. Therefore, H_0, that is, there is no direct relationship between MGB and AQ is rejected and it can be asserted, with confidence level of 95%, that the second minor hypothesis is supported. For testing the third minor hypothesis postulating that a direct relationship exists between ARS and accrual quality (AQ), the measure t for the variable APS has been examined. Considering the information in Table 9, t is greater than 1.645 (t=5.22) and, therefore, the coefficient of this variable is statistically significant. Therefore, H_0 stating there is no direct relationship between APS and AQ (accrual quality) is rejected based on the findings of the present study; so it is asserted, with confidence level of 95%, that this hypothesis (the forth minor hypothesis) is supported. The aim of evaluating t for the variable ARS was testing the forth minor hypothesis; this hypothesis says that a direct relationship would be found between PBT and AQ. Based on the findings and results in Table 9, t is greater than 1.645 (t= 3.05) and, as a result, the coefficient of this variable is statistically significant. Therefore, H_0 stating there is no direct relationship between PBS and AQ (accrual quality) is rejected and, with confidence level of 95%, it may be asserted that this hypothesis (the forth minor hypothesis) is certified. Finally, to test the main hypothesis of this study, existing a relationship between end-year balances of accrual items and accrual quality, review of findings from examination of minor hypotheses have been considered. Regarding the fact that, of four variables examined, there is a direct and positive relationship between AQ and three of them, H_0 posit there is no direct relationship between end-year balances of accrual items and AQ, is rejected and, therefore, the main hypothesis of this study is supported.

CONCLUSION

In this study, a multiple regression model has been used in order to evaluate the relationship between variables. The analysis of hypotheses in this model comes to the conclusion that there is a linear significant relationship between AQ and three variables, namely, MGB, APS, and PBT. Therefore, the final model proposed here would be defined as follows:

$$AQ= 0.18\times MGB + 0.44\times APS + 0.07 \times PBT+ \varepsilon_{it}$$

Also, general significance of the model is confirmed. The level of adjusted R Square (coefficient of determination) is 90% showing that these variables are of explanatory power for explaining 90% of variations on accrual quality. The main objective of this study is to evaluate the relationship between end-year balances of accrual items and accrual quality. To put it differently, the study has sought to address the issue whether end-year balances of such variables as business accounts and notes receivable, material and goods stock, business accounts and notes payable, have direct effect on accrual quality.

The afore-mentioned model has shown that: The relationship between business accounts and notes receivable and accrual quality is not certifiable, but the relationship between material and goods stock and accrual quality is supported. The coefficient of MGB is 0.18 showing that this direct relationship is positive; the value of this coefficient has revealed that increasing 1 unit of measurement in the quantity of MGB will result increase the variable AQ by 0.18 unit of measurement. The relationship between business accounts and notes receivable and accrual quality is not certifiable, but the relationship between material and goods stock and accrual quality is supported. The coefficient of MGB is 0.18 showing that this direct relationship is positive; the value of this coefficient has revealed that increasing 1 unit of measurement in the quantity of MGB will result increase in the variable AQ by 0.18 unit of measurement. The relationship between business accounts and notes

payable and accrual quality is supported. The coefficient of APS is 0.44 stating that this direct relationship is positive; the value of this coefficient has revealed that increasing one unit of measurement in the quantity of APS will increase the measure of AQ by 0.18 unit of measurement. Also, the relationship between the variable PBT and AQ is confirmed. The coefficient of this variable is 0.07 showing that the direct relationship between this variable and AQ is positive as well. The extent of this coefficient means that in the case of increase one unit of measurement in the quantity of APS, the value of AQ will increase by 0.07 unit of measurement. And lastly, the main hypothesis of the study supports that there is a relationship between end-year balances of accrual items and AQ. Positive coefficients of ARS, MGB, and APS suggest that a direct relationship exists between end-year balances and AQ.

LIMITATIONS

1) Data derivative from financial statement of the firms have not been adjusted in term of inflation. If such adjustment has been made in the financial statements, the afore-mentioned information may produce different results than present results.
2) The firms selected for the purposes of this study are just those listed in Tehran Stock Exchange. So generalizing the findings of the study to those firms not listed in the Stock Exchange is ambiguous.
3) There are some differences in properties of the firms like industry section, type of their products, etc.

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