

## THE RELATIONSHIP BETWEEN EARNINGS MANAGEMENT AND FINANCIAL RATIOS (A PANEL DATA APPROACH)

Asrin Sheikh Ahmadian\* and Mohammad Nazaripour\*\*

**Abstract:** Earnings management is a deliberate management action which is performed in order to accomplish particular goals following the framework of accounting principles. Managers' access to information is much more than that of the other beneficiary groups. If managers perform earnings management aiming to transfer information which is representative of the realities and the real value of a commercial unit, no objection is taken; but, when managers' goal in earnings management is to deceive the users through presenting some incorrect information regarding the firm performance, authorities might become concerned. The aim of the present research is to study the effect of earnings management on variables such as the accounts payable and debt and gross profit ratio to sales revenue. The required data has been collected from Tehran Stock Exchange over the period of 2006- 2012 and panel data regression method has been used to analyze the data. The results show that the discretionary accrual based earnings management has the most effect on the accounts payable.

**Keywords:** Earnings Management, Discretionary Accruals, Panel Data Regression, Tehran Stock Exchange

### 1. INTRODUCTION

Since the success of a commercial unit and its managers is related to a great extent to the accounts and figures in financial statements such as the reported income and earnings, considering the capability of these statements in stating a summary of the valuable information is always of importance, because this information can affect the stocks' price and profitability and help the investors in evaluating the firm value. Several attempts of managers to manipulate the earnings figures show that the final goal is to demonstrate more profitability and increase the price of the stocks. As a result, considering financial ratios as one of the most important assessment instruments of the commercial units can be useful in detecting the manipulated financial statements.

Researchers have employed different methods to determine the validity of the figures of financial statements. A group of researchers has attempted to create a

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\* M. A. in Accounting

\*\* Department of Accounting, University of Kurdistan, sanandaj, Iran.

\*Corresponding author: E-mail: mnazaripour@yahoo.com

model to predict the contexts of manipulating these figures; another group has attempted to determine some indices of artificial (unreal) financial statements through employing ratio analysis by the published financial data. The existence of artificial accounting indicates the attempts of some managers to manipulate financial statements and earnings figures. Earnings management can result in the difference of stock profitability and the real values and also a deceiving image of the market and the relation between earnings and profitability. Therefore, an effective criterion of the relation of earnings with the firm value and also considering an index to investigate the earnings quality can be beneficial in assessing the relation between earnings and the firm price. Accruals as one of these criteria, has attracted the attention of many researchers. Accruals, which are defined as the difference between accounting earnings and the cash flows resulted from the operations, create an important index for earnings management.

## **2. LITERATURE REVIEW**

The concept of earnings management has been investigated from different dimensions and several definitions have been presented in this regard. Degeorge *et al.* (1999) have defined earnings management as a kind of artificial manipulation of the earnings by the managers in order to achieve the expected level of profit for some particular decisions. As they believe, the main goal of earnings management is to manage the imagination of investors on the commercial unit. Scott (2009) has explained earnings management as the managers' deliberate actions on the quality of reporting the profit and earnings in order to reach to particular and specific goals such to be in line with the accounting principles. As Gordan *et al.* (1966) have stated, if managers select particular and specific methods of accounting and the fluctuations of the reported earnings are reduced, the result would be earnings management or smoothing. They have also mentioned that managers can affect the reported profit and the firm profit ratio relying on their authority and power which result from their freedom in the framework of the generally accepted accounting principles. Generally speaking, earnings management is defined as influencing the firm profit such that it satisfies the firm needs and the managers' expectations.

Earnings management is expressed as the managers' deliberate actions in order to reach to specific goals in line with accounting principles. Managers have access to information to which others do not. If managers intend to transfer information which is the representative of the realities and the real value of a commercial unit using earnings management, no objection is taken; however, if the managers' goal is to use earnings management as a factor to deceive the users regarding the firm performance, there will be some concerns. As Healy and Wahlen (1999) believe, earnings management is performed when managers use judgments in financial reporting and transactions' structuring to modify and change financial reporting

in order to present alternative reports on the firm's economic performance to the users of the financial statements aiming to deceive them or affect the results of transactions which are dependent on accounting figures such as profit. Two factors must be considered about earnings management:

1- Managers are allowed to apply their own opinions; it means that managers are free to select principles and procedures of reporting. As an instance, methods such as retirement plan, useful life estimation, the value of long term assets' installments, the delayed taxes, and the common methods in evaluating the assets can be used for earnings management. 2- In defining earnings management, the beneficiaries' deception is also referred. It means that sometimes managers have access to information of which the beneficiaries are not aware.

Firm managers use two methods of real and accrual based earnings management to manipulate earnings. In the first method, manipulating the accruals, managers start to deploy the accounting figures in line with their desired goals; in this method, they start to perform earnings management by accelerating income recognition and postponing expense recognition. In the second method, however, adopting some operational decisions, i.e. real activities manipulation, managers become inclined towards real earnings management and reach to their desired goals. Studies such as Healy and Wahlen (1999), Feinberg and Tirole (1995), Dechow and Skinner (2000), and Roy Chaudhuri (2006) refer to the significant methods of accelerating sales through granting discounts, changing the goods mailing list, reducing discretionary expenses such as the costs of researching, developing, and producing as the methods of real earnings management.

The study performed by Graham *et al.* (2005) showed that executive managers are interested in realizing the earnings goals such as the last year's profit and analyzers' prediction through real activities manipulation. It is so while these manipulations can potentially reduce the firm value, since manipulating real activities in the current period to increase profit may exert a negative influence on the cash flows of the future period. For example, extensive price discounts in the current period to increase sales volume and the satisfaction of earnings goals in the short term can result in the creation of customers' expectation to receive such discounts in the future periods, which implicitly indicate the lower profit margin in the future period's sales. Creating the inventory of goods more than their demand, over production will impose much keeping cost on the firm. Considering two types of earnings management, Cohen and Zarowin (2010) realized that managers are involved in real earnings management around the time of seasoned equity offerings and at this time, performance reduction is more resulted from earnings management through real activities, rather than through accruals, because real activities manipulation results in real economic conclusions. The study conducted by Chapman (2011) shows that through manipulating real activities such as price reduction in order to temporarily accelerate sales, firms attempt to

realize the earnings goals in the last semester of the year. Furthermore, firms show more reactions when facing competitive situations in comparison with earnings management motivations. In their research, Cohen *et al.* (2008) considered the amount of earnings management through accruals and real activities, in the pre and post Sarbanes Oxley periods (2003). They realized that over the period of 1987-2003, accrual based earnings management has been increased; but, it has faced a decreasing trend after the approval of the mentioned laws. On the contrary, earnings management through real activities has been significantly increased after this approval.

### 3. DATA AND METHODS

In a model presented by Jones (1991) to investigate earnings management in commercial units, it was assumed that non-discretionary accruals are fixed through time. This model, which separates discretionary and non-discretionary accruals, attempts to control the effects of economic conditions of a commercial unit on the non-discretionary accruals. In this model, the first step is to estimate the relation of total accruals for a particular time period, which is also known as the event period. Before this step, however, the total accrual is calculated using the following formula:

$$TA_{it} = (\Delta CA_{it} - \Delta CASH_{it}) - (\Delta CL_{it} - \Delta STD_{it}) - DEP_{it} \quad (1)$$

Where TA refers to the total accruals and CA refers to the current assets; CASH is the cash flows, CL is the current loans, STD is the current portion of long term debt, and DEP is the depreciation.

Having calculated total accruals, we start to estimate the used coefficients using the following relation:

$$\frac{TA_{it}}{A_{it-1}} = \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{A_{it-1}} \right) + \varepsilon_{it} \quad (2)$$

A is the total assets, REV is the total revenue, and PPE refers to Property, Plant, and Equipment.

Having estimated the parameters of the above mentioned model through time series or the cross sectional model, the non-discretionary accruals will be as below:

$$NDA_{it} = \alpha_1 \left( \frac{1}{A_{it-1}} \right) + \alpha_2 \left( \frac{\Delta REV_{it}}{A_{it-1}} \right) + \alpha_3 \left( \frac{PPE_{it}}{A_{it-1}} \right) \quad (3)$$

In the last stage, accruals are calculated through the following relation:

$$DA = \frac{TA_{it}}{A_{it-1}} - NDA_{it} \quad (4)$$

Now, using panel data regression, the amount of discretionary accruals' effect as the earnings management factor on the financial ratios of the notes payable and debt and gross profit ratio to sales is obtained:

$$VOI_{it} = \alpha_{it} + \beta_{1it} DA_{it} + \beta_{2it} A_{it} + \varepsilon_{it} \quad (4)$$

In the above mentioned pattern, VOI is the financial ratios of the notes payable, the debt ratio, and the ratio of the gross profit to sales. DA refers to the discretionary accruals and A is the firm asset.

Therefore, the main question of this research will be as below:

On which of the above-mentioned ratios is earnings management effective through discretionary accruals?

#### 4. EMPIRICAL FINDINGS

##### 4.1. Limer Test

For this test, the method presented by Chav was used. Using error term's sum of squares in Poolability test which is estimated using OLS and also the sum of squares of the error term of the unlimited model which is implemented by LSDV, the test statistic is calculated.

In the pooled model, however, group differences are not taken into account. Therefore, the null hypothesis and this test's statistics are as below:

$$\begin{cases} H_0 : \text{Pooled Model} \\ H_1 : \text{Panel Model} \end{cases} \quad (5)$$

$$F = \frac{(RSS_R - RSS_{UR}) / (N - 1)}{RSS_{UR} / (NT - K - N)} \quad (6)$$

This statistic has F distribution with N-1 and NT-K-N level of freedom.

In the above statistics,  $RSS_R$  is the total error squares of the limited model and  $RSS_{UR}$  is the sum of error squares related with LSDV model.

**Table 1**  
**The Results of Limer Test**

Equation	Statistic	df	Prob
1	5.508498	39,158	0.0000
2	2.641678	39,158	0.0000
3	9.113468	39,158	0.0000

As the results show, all the equations are in the form of a panel.

#### 4.2. Random Effects Test

Based on Hausman test (1987), the independence of the error term of the y-intercept and the explanatory variables is tested. The hypothesis of correlation non-existence between  $\alpha_i$  and  $X_{it}$  is regarded as the null hypothesis (the existence of a fixed  $\alpha$  and one error term of  $u_i$  in the y-intercept of each section).

$$\begin{cases} H_0 : \alpha = \alpha_i \\ H_1 : \alpha \neq \alpha_i \end{cases} \quad (7)$$

This way, the rejection of the null hypothesis demonstrates the correlation of the error term of the y-intercept with the explanatory variables which itself shows the fixed characteristics of each section in the form of a separate y-intercept; this means the acceptance of the fixed effects method.

**Table 2**  
**The Results of Hausman Test**

<i>Equation</i>	<i>Prob</i>
1	0.0000
2	0.0000
3	0.0000

Therefore, the null hypothesis of this research is rejected and the model is the same fixed effects model.

#### 4.3. Estimations

It has been experimentally proved that if the number of commercial units exceeds the time period of the study, the variance model will be heteroscedastic; it will have self-correlation in the other states. Since the number of cross sectional units, which is 40, is much greater than the 5-year period of the study, the variance model will be heteroscedastic in this research; in order to solve this problem, GLS method is used. To do so, the terms of the regression model are multiplied by or divided over one of the variables. As a result, GLS method is the same as OLS where data has changed such to provide the hypotheses required for OLS method. GLS method is sometimes introduced as the Weighted Least Squares, because in this method, the weighted sum of the residuals' squares becomes minimized.

In the following estimations, each of the variables is explained as below:

PA: The Sum of Payable Accounts, A: Assets, DA: Discretionary Accruals, BR: Bankruptcy Ratio, GPS: Gross Profit to Sales Ratio

**Table 3**  
**The Estimation of the First Equation**

Dependent Variable: PA				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	29504.63	6116.369	4.823879	0.0000
A	0.045024	0.002069	21.76082	0.0000
DA	2120.896	505.7673	4.193422	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.866565	Mean dependent var	679029.1	
Adjusted R-squared	0.831939	S.D. dependent var	932855.2	
S.E. of regression	397830.8	Sum squared resid	2.50E+13	
F-statistic	25.02669	Durbin-Watson stat	1.918460	
Prob(F-statistic)	0.000000			

**Table 4**  
**The Estimation of the Second Equation**

Dependent Variable: BR				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.539453	0.014233	37.90038	0.0000
DA	-0.001714	0.001300	-1.318776	0.1892
A	-5.95E-09	1.90E-09	-3.138576	0.0020
Effects Specification				
Cross-section fixed (dummy variables)				
Weighted Statistics				
R-squared	0.403975	Mean dependent var		1.376105
Adjusted R-squared	0.249310	S.D. dependent var		1.039036
S.E. of regression	0.591442	Sum squared resid		55.26903
F-statistic	2.611937	Durbin-Watson stat		2.256239
Prob(F-statistic)	0.000011			

**Table 5**  
**The Estimation of the Third Equation**

<i>Dependent Variable: GPS</i>				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	49.13917	2.397155	20.49895	0.0000
DA	-0.134428	0.513750	-0.261661	0.7939
A	6.15E-07	4.84E-07	1.270779	0.2057

contd. table 5

Cross-section fixed (dummy variables)		Effects Specification	
		Weighted Statistics	
R-squared	0.695507	Mean dependent var	139.6120
Adjusted R-squared	0.616493	S.D. dependent var	173.2603
S.E. of regression	115.1852	Sum squared resid	2096286.
F-statistic	8.802328	Durbin-Watson stat	2.291638
Prob(F-statistic)	0.000000		

In all the three methods, the variance model does not remain heteroscedastic due to the applied weights. Furthermore, according to the values of Durbin-Watson model, self-correlation exists between none of them since all the values are near 2. On the other hand, all the patterns are significant, because their F-statistic (Prob) values are less than 0.05; as a result, all of them are significant. Regarding the significance of the variables, as is clear, both are significant in the first pattern, the total asset is significant in the second pattern, and none of them are significant in the third pattern.

## 5. RESULTS AND DISCUSSION

The aim of this research was to investigate the relation between earnings management and the financial ratios of the firms accepted in Tehran Stock Exchange Market. The results of the study showed that discretionary accruals as an index for earnings management had a positive effect on the total payable accounts, while it does not affect the other two variables, i.e. the ratio of debt and gross profit to sales.

Since a few studies have been conducted on earnings management and its relation with the financial ratios, the following issues can be useful for the future investigations:

- The consideration of the managers' use of real earnings management in comparison with accrual based earnings management; and
- The effect of earnings management on other financial ratios.

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