An Investigation of the Relationship between Earnings Management and Financial Ratios (Panel Data Approach)

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ABSTRACT

Earnings management is regarded as conscious actions taken by manager to achieve certain objectives at the framework of accounting procedures. Management, compared to others, has access to information which is not accessible for others. If mangers tend to transmit information introducing actual value of commercial units using earnings management, it is acceptable, however, concern is created when the goal of earnings management is considered as a factor deviating users from information pertaining to the company's performance. In this regard, this article attempts to investigate the effect of earnings management on some variables such as accounts payable, debt ratio, and gross profit to sale ratio. To this end, data related to companies listed in Tehran stock exchange during 2009-2015 was employed and analyzed with the aid of the panel data regression method. According to the research findings, discretionary accruals-based earnings management has the highest effect on accounts payable.

Keywords: Earnings Management, Panel Data Regression, Discretionary Accrual Items
JEL Classifications: G, G1, G18

1. INTRODUCTION

Since the situation of a commercial unit and its mangers highly depends on the frequency levels of accounts and figures available in financial statements, such as, reported income and profit, it is important to investigate the capability of financial statements to present a summary of valuable information. Due to the fact that such information can influence price and return on stock and help investors to evaluate a company's value that this research was conducted. Various studies on managers' efforts to manipulate profit figures reveal that the major goal is to show higher returns in order to affect stock price increases. Therefore, investigating financial ratios, as one of the most important tools of evaluating commercial units, can be applied to recognize manipulated financial statements.

Researchers have employed different methods to determine the actuality of financial statement figures. "A group of researchers" have attempted to construct models to predict figure manipulation areas. "Another group" has attempted to determine some unreal financial statement indices using ratio analysis through published financial data.

"Creative accounting" indicates the efforts of some mangers to manipulate financial statements and profit figures. Profit manipulation can lead to the difference between return on stock and its actual value and the creation of an image deviating from the relation between profit and return. Accordingly, an effective criterion of the relation between profit and value of a company needs to be established. Accordingly, an index to investigate profit quality can be useful to evaluate the relationship between profit and price of a company.

As one of these criteria, accrual items have been considered by many researchers. Accrual items which are defined as the difference between accounting profit and cash flows, due to operations, could establish an important index for earnings management.

2. RELATED LITRATURE

The concept of earnings management has been studied from various aspects and different definitions have been presented in this regard. Degeorge et al. (1999) defined earnings management as a kind of earnings manipulation by manger to achieve an expected level of earnings for some certain decisions (such as analyzers or

estimating previous earnings trend to predict future earnings). As they believe, the main purpose of earnings management, in fact, is ti mange investors' imagination about commercial unit. Scott (2009) also defined earnings management as conscious actions taken by manger regarding the way of reporting in order to achieve certain goals based on accounting principles.

According to Gordan et al. (1966), if mangers select a certain accounting method and the fluctuations of reported profits are decreased, earnings management is resulted. They also asserted that mangers, in their power range which is due to freedom of action in the framework of principles and methods accepted in accounting, can influence reported profit and the profit rate of the company. In general, "earnings management" refers to the influence on the profit of a company in such a way that the interests and benefits of the company and its managers are met.

Healy and Wahlen (1999) also believe that earnings management occurs when manger use judgment in financial reporting and transactions' configuration to modify or change financial reporting in order to deviate financial statements from the actual performance of the company. Another purpose of such deviation may be influencing transactions' results which depend on accounting figures such as profit. In earnings management, two factors should be considered:
1. Mangers are allowed to apply their personal opinions, i.e., a manger is free to select reporting procedures and principles. A manger, for example, can use retirement plan, shell life estimation, and salvage value of long-term assets, deferred taxes, and common methods of inventory valuation for earnings management.
2. In the definition of earnings management, it is referred to deviating beneficiaries. That is, mangers sometimes have access to information which is unknown to beneficiaries.

2.1. Previously Conducted Studies
To manipulate earnings, company managers employ two methods including accrual items-based earnings management and actual earnings management. In the former method, managers deploy accounting figures according to their desired goals through manipulating accrual items. In this method, the manager attempts to manage earnings by accelerating recognizing incomes and delay in costs recognition in order to present better performance during the current period. However, in the latter case the manager manages actual earnings and achieves earnings through the adoption of some operational decisions or manipulating actual activities.

In some studies such as Healy and Wahlen (1999), Fudenberg and Tirole (1995), Dechow and Skinner (2000), and Roychowdhury (2006), some methods including sale acceleration through granting discounts, changing shipment tables, decreasing discretionary costs such as research and development and excessive production have been referred to as actual earnings management methods.

Graham et al. (2005) revealed that executive mangers tend to meet objectives such as the past year earnings and predicting

analyzers through manipulating actual activities while such manipulation can potentially decrease the value of the company. It is due to the fact that actual activities during the current period to increase earnings may negatively influence cash flows of the next period. Wide discounts during the current period to increase the volume of sales and estimate earnings objectives in short-term, for instance, can lead to the creation of customers' expectation to receive such discounts in the next period. Implicitly, such discounts indicate a lower profit margin in the next sales period. Creating excess demand, over production capacity will also impose heavy maintenance costs to company.

Investigating both types of earnings management, Cohen and Zarowin (2010) found that during seasonal stock supply, mangers are often involved in actual earnings management. They also concluded that performance reduction during more seasonal stock supply is a result of earnings management through actual activities rather than earnings management through accrual items. It is due to the fact that actual activities manipulation is followed by economic actual results.

Chapman (2011) also reported that during the ending 3 months of the financial year, companies attempt to meet earnings goals through manipulating actual activities such as decreasing price to temporarily increase sales. Moreover, companies show more reaction to earnings management incentives in competitive situations.

In their study, Cohen et al. (2008) investigated the extent of earnings management through accrual items and actual activities before and after the inception of the Sarbanes–Oxley Act (2003). They revealed that earnings management through accrual items have increased from 1987 to 2003, but that the trend has decreased after the inception of the act. In contrast, earnings management has significantly increased through actual activities after approving the act.

3. METHODOLOGY

The statistical population included non-financial companies listed in stock exchange during 2009-2015 (N = 450). In this research, systematic sampling was employed. The inclusion criteria were as following:
1. The companies were of investment and holding companies
2. To create the possibility of comparison, March 19 was considered as the end of the companies' financial year
3. Financial information of the companies was available
4. The time period of the research was from the beginning of the financial year of 2009 to the end of financial year of 2015 (7 financial years).

To analyze the obtained data, panel data regression method was used.

In a model proposed by Johns (1991) to investigate earnings management in commercial units, it was supposed that nondiscretionary accrual (NDA) items are constant during the time. In this model, separating discretionary and NDA items, the

effect of economic conditions of a commercial unit on NDA items has been controlled. In the mentioned model, the first step is to estimate the relation of total accrual items for a certain period of time, called event period. Before performing this stage, total accrual items are computed using the following formula:

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

Where, TA indicates accrual items; CA indicates current cash; $CASH$ indicates cash; CL indicates current liability; STD indicates current portion of long-term term, and DEP indicates depreciation.

After computing accrual items, the employed coefficients are estimated using the following relation:

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

In the above relation, A indicates total assets; REV indicates total revenue and PPE indicates tangible fixed assets.

After estimating the parameters of the above equation through time series or cross-sectional model, NDA items are as following:

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

At the last stage, discretionary items are computed through the following equation:

$$DA = \frac{TA_{it}}{A_{it-1}} - NDA$$

Now, the effect of accrual items as earnings management agent on financial ratios of notes payable, dept ratio and gross profit to sale ratio are found using panel regression:

$$VOI_{it} = \alpha_{it} + \beta_{1it}DA_{it} + \beta_{2it}A_{it} + \varepsilon_{it}$$

In the above model, VOI indicates financial ratios of notes payable, debt ratio and gross profit to sale ratio; DA indicates accrual items and A indicates income of company.

Therefore, the main research question will be as follows:

Which of the above ratios are influenced by earnings management through accrual items?

4. FINDINGS

4.1. Limer Test
The method proposed by Chaw is used for this test. In this regard, the test statistic value is computed using sum of square of error term in limited pooling model which has been estimated through ordinary least square (OLS) method as well as the sum of square of error term which has been run through least squares dummy variable (LSDV) method. By limited model, it means that the differences of cross sections are considered in this

model. However, in the pooling model, group differences are not considered. Accordingly, the null hypothesis and the test statistic can be shown as following:

$$\begin{cases} H_0 : \text{Pooled model} \\ H_1 : \text{Panel model} \end{cases}$$

This test statistic has the distribution of F with $N-1$ and $NT\text{-}k\text{-}N$ degree of freedom.

In the above statistic, RSS_R indicates the sum of squares of contrast model error and RSS_{UR} indicates the sum of squares dependent on LSDV model.

As shown in Table 1, all the equations are in the form of panel.

4.2. Random Effects Model
According to Hausman's test (1987) the independence of interception error term and descriptive variables are tested. The assumption of lack of correlation between α_i and X_{it} is considered as the null hypothesis (the presence of a constant $\alpha$and an error term of u_i in interception related to each cross section).

$$\begin{cases} H_0 : te\alpha_i \\ H_1 : t\alpha_i \end{cases}$$

Therefore, rejecting the null hypothesis indicates that there is a correlation between intercept error term and descriptive variables. In other words, the features of each cross section in the frame of separate intercept are constant; so, the fixed effects method is accepted.

According to Table 2, the research null hypothesis is rejected and the model is the same fixed effects.

4.3. Estimations
Empirically, it has been proved that if the number of cross-sectional units is more than the studied period, variance model will be heterogeneous. In a reverse case, the variance model will have autocorrelation. In the present research, since the number of cross-sectional units (40) is much higher than the 5-year studied period, it is likely that the variance model to be heterogeneous. To solve the problem of variance heterogeneity, we use the GLS method. To this end, two sides of regression equation is multiplied or divided by one of the variables. Therefore, GLS is the same Pls method in which data are converted such that the assumptions required by OLS method are supplied. Sometimes, GLS is also

Table 1: Limer test results

Equation	Statistic	df	P
1	5.508498	(39,134)	0.0000
2	2.641678	(39,134)	0.0000
3	9.113468	(39,134)	0.0000

Table 2: Hausman test results

Equation	P
1	0.0000
2	0.0000
3	0.0000

known as weighted least squares method since in this method, weighted sum of residuals' square is minimized while in OLS, their non-weighted sum is minimized.

In estimation, each of the variables is as following:
PA: Total payable accounts
A: Total income
DA: Nondiscretionary accrual items
BR: Debt ratio
GPS: Gross profit to sale ratio.

In the Tables 3-5, variance of heteroskedasticity problem has been removed due to the applied weight. Furthermore, with respect to Watson–Durbin values, none of the models has the problem of autocorrelation since all the values are placed near to number 2. On the other hand, all the patterns are generally significant since P (F-statistic) is <0.05 in all of them. Accordingly, all the three models are significant. However, regarding the significance of the variables, we observed that two variables are significant in the first model total income is significant in the second model and none of the variables are significant in the third model.

In estimating the first pattern, the variable of DA is significant since the value of its P < 0.05. Also, the value of this variable's coefficient is 2120,896. Therefore, its equation is as following:

$$PA_{it} = 29504.63 + 0.0450A_{it} + 2120.896DA_{it}$$

Therefore, based on the above estimations of involuntary accruals has a positive effect on accounts payable.

In estimating the second pattern, the variable of DA is significant since the value of its P is more than 0.05. Therefore, its equation is as following:

$$BR_{it} = 0.5394 - 5.95E\text{-}09A_{it}$$

In estimating the third pattern, variables are not significant; therefore, no pattern is estimated.

5. CONCLUSION

The purpose of the present study was to investigate the relation between earnings management and financial ratios of the companies listed in Tehran stock exchange. The research findings revealed that discretionary accrual items, as an index of earnings management, has a positive effect on payable accounts while the two other variables including debt ratio and gross profit to sale ratio have no effect on payable accounts.

Given that there are few Iranian studies conducted on earnings management and its relation with financial ratios, further studies can be performed to investigate the extent of using actual earnings management methods by managers compared to accrual items-based earnings management as well as the effect of earnings management on other financial ratios.

Table 3: The first equation estimation

Dependent variable: PA				
Variable	**Coefficient**	**SE**	**t-Statistic**	**P**
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				
R²	0.866565	Mean dependent variable		679029.1
Adjusted R²	0.831939	SD dependent variable		932855.2
SE of regression	397830.8	Sum squared residual		2.50E+13
F-statistic	25.02669	Durbin–Watson statistics		1.918460
P (F-statistic)	0.000000			

SE: Standard error, SD: Standard deviation

Table 4: The second equation estimation

Dependent variable: BR				
Variable	**Coefficient**	**SE**	**t-statistic**	**P**
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				
R²	0.403975	Mean dependent variable		1.376105
Adjusted R²	0.249310	SD dependent variable		1.039036
SE of regression	0.591442	Sum squared residual		55.26903
F-statistic	2.611937	Durbin–Watson statistics		2.256239
P (F-statistic)	0.000011			

SE: Standard error, SD: Standard deviation

Table 5: The third equation estimation

Dependent variable: GPS				
Variable	**Coefficient**	**SE**	**t-statistic**	**P**
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
Effects specification				
Cross-section fixed (dummy variables)				
Weighted statistics				
R²	0.695507	Mean dependent variable		139.6120
Adjusted R²	0.616493	SD dependent variable		173.2603
SE of regression	115.1852	Sum squared residual		2096286.0
F-statistic	8.802328	Durbin–Watson statistics		2.291638
P (F-statistic)	0.000000			

SE: Standard error, SD: Standard deviation, GPS: Gross profit to sale ratio

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