Earnings management checked between changes in profit margins and asset turnover ratio

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ABSTRACT: This paper aims to study and investigate the relationship of earnings management detection through changes in the profit margin and asset turnover ratio. It is applied based on the objective and its statistical population includes the investment companies listed on the Stock Exchange during 2007 until the end of financial year 2012. According to the main result of this study, there is a significant inverse relationship between the dependent variable (aggregate accruals) and changes in profit margins. In other words, by increasing the aggregate accruals, the changes in profit margins will decline, and vice versa. The dependent variable (aggregate accruals) has a direct and significant relationship with the changes in the asset turnover ratio. This means that as the result of the increase in the aggregate accruals, the changes in profit margins will raise, and vice versa. Calculations indicate a one unit increase in the amount of profit margin variable reduces the aggregate accruals to -1.09E+10. Furthermore, a one unit increase in the asset turnover variable leads to the enhanced aggregate accruals to 8331.777.

KEYWORDS: Earnings management, accruals, financial ratios.

1 INTRODUCTION

Nowadays, the financial markets are considered the most important ways for the big and small savings investments. The financial markets determine the stock value in the market according to the expected profit of company and the information supporting these expectations. The income measurement process and its result play an important role in corporate governance and the financial statements users often pay more attention to them. Since the calculation of economic profit is affected by the accounting estimation methods and the business management is responsible for preparing the financial statements for various reasons, the management manages the acquired profit (Ghosh, S. et al, 2013). Meanwhile, the reverse changes of profit margins and the asset turnover ratio can be considered as a potential for earnings management in order to destroy the shareholders' wealth over the long term and can loss the investors' confidence in reported profits and ultimately reduction in investing in equity markets. Thus, it is essential to conduct the research on the changes in the profit margin changes and asset turnover ratio and their relationship with the upward or downward earnings management (Mishra, A.K. et al, 2012). The profit margin changes and asset turnover ratio can be the signs of the acquired profit management. Accordingly, in the profit and loss statements and balance sheet classification, which can be influenced by the operating income and net operating assets, it is more likely that the managers manipulate the operating income and net operating assets according to their objectives. The studies indicate that the managers moderate the reported profits through choosing the certain accounting policies, and changing the accounting estimates and accruals management. The "Income Reporting" is one of the financial statement elements considered as the performance evaluation criterion and the profitability of profit unit. However, calculating the net profit of a profit unit is affected by the accounting methods and estimates. The income and loss statement includes the output of sources controlled by the business unit management and reflects the performance of business unit during the target period (Cosmina Pitulice, I. et al, 2013). Despite the fact that most of the academic studies on earnings management by accruals have utilized the modified Jones model, this study applies the changes in the profit margin and asset turnover ratio in addition to the modified Jones model in order to detect the upward or downward earnings management and also performs a comparison between the modified Jones model and changes in the profit margin and asset

turnover ratio in the field of obtaining more information content in detecting the earnings management and it is assumed that the studied companies have had no strategic modification during the years of study.

The objective of this paper is to study the earnings management according to the significant changes in the profit margins and the asset turnover ratio and provide a suitable model by detecting the relationship between the profitability components in the sustainable economy. Hence, this paper also pays attention to the theories of capital structure which becomes sustainable by the profitability management.

2   RESEARCH LITERATURE

The profitability management and profit detection provide a unique theoretical model for every enterprise to be accountable to the stakeholders for the performance of management governing the organization because the organization survives by capital formation as the result of profitability and acquiring the benefits for its owners and beneficiaries. The studies indicate that none of the current theories and models can individually explain the factors which affect determining the corporate capital structure and provide the decisive responses to the questions in this regard. In numerous situations, a number of companies choose the issuance of stock, some of them the application of internal resources and others the borrowing method to finance their activities. Thus, it seems that the lack of a comprehensive theory, which can fully explain and predict the corporate capital structure and financing behavior, is the biggest current problem. However, there is no evidence for formulating such this theory in the near future (Khaleghi-Moghaddam, 2006). The issue of how the companies choose and adjust their strategic financial resources has been taken into account by most of the financial economists for a long term and is still a source of much debate (Marques, 2004). It was previously believed that the nature of such these problems is so complex, thus it is impossible to develop a reasonable theory in this regard. However, the studies indicate that none of the current models and theories can fully explain the factors, which affect determining the corporate capital structure, individually and find the decisive response to this question that why a number of firms choose the issuance of stock, some of them the internal resources and others the borrowing method for financing under various conditions (DeAngelo, 2006).

2.1   THEORETICAL FOUNDATIONS

The studies by Ball and Brown (1968) indicate that the changes in accounting earnings and stock prices are linked together. According to Schipper's view (1989), the earnings management is the targeted intervention in the process of extra organizational financial reporting of firm to gain the personal purposes. Healy and Wahlen (1999) argue that the earnings management occurs when the managers judge and obtain their desires in financial reporting with the aim to mislead the financial information users. According to the studies by Degeorge et al (1999), the corporate investors and executives pay accurate attention to the corporate income reporting.

The earnings management in this research applies the discretionary accruals concept which assumes that the managers primarily rely on their authorities over the accounting accruals including the discretionary and non-discretionary accruals. The discretionary accruals are determined by the management, while the non-discretionary accruals are financially determined and are outside of the management jurisdiction. The applied terms of this study are briefly described as follows.

Changes in Profit Margin (ΔPMt): The ratio of operating profit to sales – the ratio of operating profit to sales of last year.

Changes in asset turnover ratio ($\Delta ATOt$): The ratio of sales to the net operating assets- the ratio of sales to the net operating assets of last year.

2.2   LITERATURE REVIEW

Burgstahler and Dichev (1997) concluded that the investors in companies with multiple owners and no major shareholders relied on the low-cost criteria such as the profit-based indicators instead of accurate detailed processing. Dichev et al (1996) argue that the firms with a large number of board members, who are mainly responsible, apply more earnings management than the other companies. Bushee (1998) argues that the likelihood of earnings management is higher in firms largely owned by the institutional investors than others. McNichols (2000) argues that the future profitability growth forecasting factor is ignored in Jones model (1991) and should be considered as a variable affecting the earnings management. Xie (2001) argues that forecasting the corporate future earnings growth affects the earnings management. He concludes that the increased likelihood of profit growth increases the use of earnings management. Beatty et al (2002) measured the change in the corporate profitability by applying the changed cash flow and announced that the likelihood of earnings management in banks with positive change in the cash flow is more than others.

The purpose of Lange Meier in his paper is to examine the financial performance of a sample of crop/beef cow farms using the operating profit margin ratio and farm growth as relevant measures (Lange Meier, M., 2011). Deshpande in his paper proposed a model to void for a single product inventory control of a supply chain consisting of three echelons. A generic modification proposed to the membership functions of the fuzzy goal-programming approach is used to mathematically map the aspiration levels of the decision maker (Deshpande, P. et. al, 2011). The purpose of Iren RADU is to determine the managerial skills developed by the Romanian fluvial shipping company NAVROM, compared with ten other major competitors in the same domain, using financial information of these companies during the years 2005-2010 (Iren RADU, R. 2012). Huang in his study has developed a mathematical model for analyzing a capacitated reverse supply chain consisting of a single manufacturer and multiple retailers (Huang, S.M. et al, 2013). Baris presents a computational method to determine the order-up-to levels that maximize the expected profit with profit margins, inventory holding and substitution costs subject to service-level constraints (Baris, T. et al, 2013). Ray suggests a strong negative relationship between the measures of working capital management including the number of days accounts receivable and cash conversion cycle, financial debt ratio with corporate profitability (Ray, S. 2012). Talha focuses on the impact of working capital management on profitability of selected Indian corporate hospitals (Talha, M.S. et. al, 2010).

3 RESEARCH METHODOLOGY

This study is empirical and descriptive and seeks to describe the relationship between the variables through the statistical tests and is put into the positive theory domain. It is applied according to the objective and its results can be helpful for a wide range including the stakeholders, auditors, SEC officials, researchers, and standard developers. Eviews software is utilized in order to test the hypotheses. The purpose of this study is to evaluate the numerical relationship between the changes in profit margins and asset turnover ratio and the discretionary accruals. Since the type of relationship in the correlation hypotheses and type of data scales are proportional and the set of variables is also more than 2 and the number of tests can be unlimited, the regression is the most appropriate formula for test. Thus the two-or-more-variable regression model is applied in this regard.

3.1 DATA COLLECTION

Since the applied data in this study are among the secondary data which is obtained from other sources, it is among the documentary methods. Therefore, the research variables are extracted and analyzed by special formula available in the research literature. Given the availability of financial information in this article, the research period is from the fiscal year 2007 to the end of 2012.

3.2 STATISTICAL POPULATION

According to the classification made n Tehran Stock Exchange, the companies on Stock Exchange are classified into nine industries one of which is the financial intermediation industry. The statistical population of this study consists of the investment companies listed on Stock Exchange during the period from the fiscal year 2007 to the end of 2012. The following criteria are considered in selecting the samples.

1) The investment companies with constant operation during the study period.
2) The standard information filtering is performed.
3) The dates of their entry to the Stock Exchange are before 2007.

Cochran formula is applied for calculating the number of samples. The initial estimates indicate that 216 companies are eligible. Thus, according to the following calculations, 138 companies are randomly studied and selected.

$$n_{cochran} = \frac{\dfrac{p(1-p)z_{1-\alpha/2}^2}{d^2}}{1+\dfrac{1}{N}\left[\dfrac{p(1-p)z_{1-\alpha/2}^2}{d^2}-1\right]} = \frac{\dfrac{0.5*0.5*(1.96)^2}{(0.05)^2}}{1+\dfrac{1}{216}\left[\dfrac{0.5*0.5*(1.96)^2}{(0.05)^2}-1\right]} = \frac{384.16}{2.77389} \cong 138.49$$

3.3   RELIABILITY AND VALIDITY OF RESEARCH

Since the data should have the computational quality and acceptability in the research, there should be an accurate indicator of what is the goal of measurement. The validity and reliability are applied for evaluating the measurement tool. Thus, the mentioned concepts are utilized for evaluating the research tool quality.

For enhancing the research validity, this study considers different time periods for measuring the relationship between the variables. Furthermore, the target ratios are extracted through the mathematical operations in accordance with the existing theories of financial and accounting management in order to measure the studied variables. According to this method for extracting the research variables, it is expected that the obtained tools and sizes are validated.

Since the financial statements of companies listed on Tehran Stock Exchange are applied for calculating the variables in this study, these financial statements should be accepted and approved by reliable auditors of Stock Exchange, thus they will have the reliability in this regard.

3.4   RESEARCH HYPOTHESES

In this paper, the earnings management or (aggregate accruals) is considered as the dependent variable and the independent variables include the changes in profit margin and asset turnover. If the changes are related, the earnings management is upward otherwise it is downward. The change in the asset turnover ratio is considered as the ratio of sales to the net operating assets- the ratio of sales to the net operating assets of previous years.

Hence, the following research hypotheses are as follows:

- ✓   Positive changes in the profit margins indicate the upward earnings management.
- ✓   Positive changes in asset turnover ratio indicate the upward earnings management.

Given the variables defined in this paper, the regression model (Y) is formulated according to the following formula, in which α is the constant value, β1 and β2 are the coefficients of profit margin variables, and the asset turnover, respectively, and ε is the model error term. The amount of β is calculated by Pearson correlation coefficient.

$$Y = \alpha + \beta_1 x_1 + \beta_2 x_2 + \varepsilon$$

4   RESEARCH FINDINGS

The pre-tests for estimating the first hybrid regression model are presented as follows.

4.1   STATIC TEST OF RESEARCH VARIABLES

This section investigates the durability of research variables through the unit root test. If a variable is not durable, it should become durable by applying the techniques or this variable should be removed from the model in order to have no negative effect on the estimates. The results of test are presented in Table 1.

Table (1) The results of unit root reliability test for the dependent variable of aggregate accruals

Pool unit root test: Summary Sample: 1385 1390				
Method:	Statistic	Prob.**	Cross-Sections	Obs.
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-23.4713	0.0000	123	615
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat (**IPS**)	-3.90988	0.0000	123	615
ADF - Fisher Chi-square	369.937	0.0000	123	615
PP - Fisher Chi-square	445.210	0.0000	123	615

The Prob. amount of IPS Statistics and other statistic is less than the significance level of 1%, 5% and 10%, thus it can be concluded that the hypothesis of non-reliable Return on Asset variable is rejected and this variable is reliable at the levels

above. The summary of static test results through the IPS unit root test in the time series of model are presented in Table 2 for research variables.

Table (2) The results of IPS test for the reliability of research variables

Variable	IPS	Prob*	Result	Degree
Aggregate accruals	-3.90988	0.000	Reliable	I(0)
Changes in income ÷ 1	-300.017	0.000	Reliable	I(0)
Changes in income ÷ Assets of the previous year	-10.8621	0.000	Reliable	I(0)

Independent variables of research are static, thus the models can be fitted by determining the fitness of variables and the models will be faced with no problem. Furthermore, since all variables of model are static, there is no need for the co-integration test.

4.2   CHOW TEST

In this test, the equal y-intercept (hybrid method) is compared to the opposite H1 which is the anisotropy y-intercept. Thus the Fixed effect model is approved in the case that the H0 is rejected. Chow test results are presented in Table 3.

Table (3) Chow test results of research variables

Effects Test	Statistic	d.f.	Prob.
Period F	0.084958	(5.729)	0.9946
Period Chi-square	0.429909	5	0.9945

The amount of Prob is more than 5% and the hypothesis of y- intercept equalities is not rejected. At this stage, the fixed effect model should be examined as the preferred model is selected. However, the fixed effect model should be tested compared to the random effect model. Hausman test is applied for this case.

4.3   HAUSMAN TEST

Based on Hausman test, the existence of difference between the estimators of fixed effects and random-effects approach is considered as the null hypothesis. Thus, the rejected null hypothesis indicates the fixed effect method. The results of test are presented in Table 4.

Table (4) Hausman test model

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	0.372757	3	0.9458

The amount of Prob is more than 0.05 and the null hypothesis, based on the lack of relationship between the individual effects and explanatory variables, is not rejected. Therefore, the fixed effects method should be applied for estimating both models.

4.4   ESTIMATING THE MODEL BY THE FIXED EFFECTS MODEL

The results of model estimation by the hybrid approach are presented in Table 5 by considering the random effects through Eviews software.

Table (5) The results of estimating the Jones aggregate random item model considering the fixed effects

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1043070	189382.9	5.507733	0.00000
X1 (Changes in income ÷ 1)	-1.09E+10	6.63E+09	-2.64106	0.01012
X2 (Assets of previous year ÷ Changes in income)	8331.777	1596.198	5.219765	0.00000
Fixed Effects (Period)				
2007 C	-166535			
2008 C	-73435.6			
2009 C	12747.85			
2010 C	-52236.6			
2011 C	187107.7			
2012 C	92351.37			
Effects Specification Period fixed (dummy variables)				
R-squared	0. 38395	Mean dependent var.		998285.6
Adjusted R-squared	0.027842	S.D. dependent var.		4843290
S.E. of regression	4775390	Akaike info criterion		33.60797
Sum squared resid	1.66E+16	Schwarz criterion		33.66412
Log likelihood	-12392.3	Hannan-Quinn criter.		33.62962
F-statistic	3.638396	Durbin-Watson stat		1.945081
Prob(F-statistic)	0.000364			

According to the results of estimating the model, the statistics (R-squared) of coefficient of determination indicates that 38% of changes in the dependent variable (aggregate accruals) can be explained by two explanatory variables of x1 (Changes in income ÷ 1) and x2 (Changes in income ÷ asset of previous year). Obviously, to increase the statistics amount (R-squared), other variables affecting the dependent variable (aggregate accruals) should be followed.

According to the results of estimating the coefficients of two explanatory variables, x1 (Changes in income ÷ 1) and x2 (Changes in income ÷ asset of previous year) that are less than 0.05, it can be concluded that the hypothesis for the lack of significant relationship between these variables are rejected.

- There is an inverse relationship between the variable, x1, with the dependent variable (aggregate accruals). In other words, with one unit increase in the value of variable, x1, (changes in income ÷ 1), the aggregate accruals will be decreased equal to -1.09E +10 units.

- There is a direct relationship between x2 variable and the dependent variables (aggregate accruals). This means that with one unit increase in x2 variable (Changes in income ÷ asset of previous year), the aggregate accruals is increased to 8331.777 units.

According to the calculations for the research hypothesis, it can be concluded that:

1 – There is a significant but inverse relationship between the dependent variable (aggregate accruals) with the changes in the profit margins. This means that with one unit increase in the aggregate accruals, the changes in profit margin will fall, and vice versa.

2 – There is a direct and significant relationship between the dependent variable (aggregate accruals) and the changes in the asset turnover ratio. This means that with one increase in the aggregate accruals, the changes in the profit margins rise, and vice versa.

4.5   POST-TESTS FOR ESTIMATING THE REGRESSION MODEL

- Regression true test

The regression true test is done through Durbin-Watson test. The results are presented in Table 6.

Table (6) The results of Durbin-Watson statistics and critical quantify CRDW

Result	Critical quality at the level of 10%	Critical quality at the level of 5%	The amount of Durbin-Watson statistics resulted from the regression
Rejecting the null hypothesis	0.323	0.386	1.945

According to the obtained results, it can be concluded that the co-integration (long term relationship) is confirmed between the variables of model. Therefore, it is obvious that the performed simple regression above indicates the long-term equilibrium relationship between the variables. In other words, the estimated coefficients are not only true in the short term, and they can also be used in the analysis of long-term relationships.

- Normality Test of error distribution (residuals)

Jarque-Bera test is one of the proposed tests for evaluating the data normality and performs this test based on the values of skewness and kurtosis of sample data. The values of skewness near zero and the kurtosis near three represent the normality of error distribution. The normality of studied data is the null hypothesis of this test. The normality test of residual terms and the error standard normal diagram should be observed in order to investigate this hypothesis. This test represents the histogram of residual term and Jarque-Bera statistics for normality plus some of the simple descriptive statistics of residual term. The normality probability of research models is greater than 0.05, thus the normality of model distribution is not rejected at the confidence level of 0.95; hence, it can be concluded that the distribution of errors (residuals) has the normal distribution. The results of calculation are shown in Figure 1.
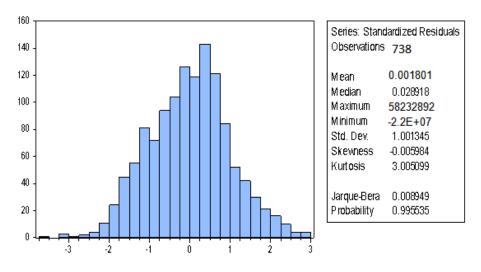

Figure (1) The results of residual term normality test

The results of calculation indicate that the values of skewness near zero and the kurtosis nearly three defined represent the normality of error distribution.

5   CONCLUSION AND SUGGESTIONS

This study investigated the relationship between the earnings management with the notation of "aggregate accruals" with the variables including the changes in the profit margins and changes in the asset turnover ratio. In terms of the procedures and similarities in some of the results, this research is consistent with some of the previous studies such as (Rezazadeh, 2010), (Bagheri, 2007), (Khodadadi, 2012), and (Sajjadi, 2007). According to the results of estimated coefficients of two explanatory variables, x1 (Changes in income ÷ 1) and x2 (Changes in income ÷ asset of previous year), which are less

than 0.05, it can be concluded the hypothesis for the lack of significant relationship between these variables is rejected at the significance level of 0.95.

- The main result of study

The dependent variable (aggregate accruals) has a significant inverse relationship with the changes in profit margins. In other words, with one unit increase in the aggregate accruals, the changes in profit margin will fall, and vice versa. The dependent variable (aggregate accruals) has a direct and significant relationship with the changes in asset turnover ratio. This means that with one unit increase in the aggregate accruals, the changes in the profit margin will rise, and vice versa.

- There is an inverse relationship between the profit margin and the dependent variable (aggregate accruals). In other words, with one unit increase in the amount of profit margin variable, the amount of aggregate accruals is reduced to -1.09 E+10, and vice versa.

- There is a direct relationship between the asset turnover variable and dependent variable (aggregate accruals). In other words, with one unit increase in the amount of asset turnover variable, the amount of aggregate accruals is increased to 8331.777, and vice versa.

- According to the regression model defined in the article hypotheses (Section 3-4), the model which is calculated by the coefficients of table, is presented as follows.

$$Y = \alpha + (-1.09E + 10) X_1 + (8331.777) x_2 + \varepsilon$$

SUGGESTION

✓ The research results indicate that there is a direct inverse relationship between the changes in profit margins and the profitability management. The managers should pay attention to this ratio in their estimates and financial planning and adapt the performance with the objective of profitability through following the target ratio procedure.

✓ The research results indicate that there is a direct relationship between the changes in the asset turnover ratio and the profitability management. The managers should pay attention to this ratio in their estimates and financial planning and adapt the performance with the objective of profitability through following the target ratio procedure.

SUGGESTIONS FOR FUTURE STUDIES

The earnings management means smoothing the computing income in the current period. In general, the income smoothing refers to the corporate management's dominance over the transposition of recording the costs and revenues or expenses accounting, or taking into account the costs and transferring them into the following years, so that the company will be able to utilize the profits without major changes during a few consecutive years. The earnings management is generally done under two ways (Nazemi-Ardakani, 2010).

1 - The manipulation of discretionary accruals

2 - The manipulation of real activities

Therefore, the following suggestions are offered according to the subjects above.

✓ Investigating the relationship of profit margin according to the management's desired changes in the discretionary accruals.

✓ Investigating the relationship of inventory turnover according to the management's desired changes in the discretionary accruals.

✓ Investigating the relationship of profit margin according to the management's desired changes in the real activities.

✓ Investigating the relationship of asset turnover ratio according to the management's desired changes in the real activities.

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