

## A Relationship between Income Smoothing Practices and Firms Value in Iran

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### **Abstract**

This paper examines the relationship between income smoothing practices and firms value in Iran. This research also studies the effect of the firms' size on the tendency to smooth income. The sample comprises 200 companies listed in the Tehran Stock Exchange within the period of 1999-2005. The "coefficient of variation method" introduced by Eckel (1981) has been modified to determine income smoothing practices. The result indicates that income smoothing practices is present although its percentage is low. The univariate test has found that smaller firms have greater tendency to smooth income rather than larger firms. Then, an Ordinary Least Square (OLS) regression was conducted on a modified income statement model. The heteroscedasticity problem detected by a diagnostic test was encountered by (1) deflating the variable by total sales and (2) using White's heteroscedasticity-adjusted standard errors. The consistent results obtained signify that the valuation of firms concerns more on the magnitude of earnings rather than earnings stream.

**Keywords:** Income Smoothing, Firms Value, Eckel Coefficient.

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## 1- Introduction

Financial statements are the medium used by managers to show the results of their stewardship towards the resources entrusted to them. The statements are prepared to convey information regarding the financial position, performance and cash flows of a firm. Since stockholders have no access to a firm's accounting records, they depend heavily on such financial statements when making any judgments and decisions. Because of this, managers tend to report favorable accounting numbers in their financial statements.

The emergence of creative accounting enables managers to 'cook the book' and 'window-dress' their firm by taking advantage of the loopholes in accounting standards. Since the financial statements contain manipulated information, they become less reliable. Although creative accounting is not against the law, in the hands of less a scrupulous management, it can be a highly dangerous instrument of deception (Naser, 2003). The users of financial statements can be misled when making decisions based on manipulated accounting numbers. To a certain extent, the existence of creative accounting distorts the usefulness of financial statements.

This paper examines one of the prevalent examples of creative accounting, which is the income smoothing. Income smoothing is defined as a deliberate dampening of fluctuations about some level of earnings considered to be normal for the firm, (Barnea *et al.*, 1986). On the other hand, Beidleman (1993) defined income smoothing as an attempt on the part of the firm's management to reduce abnormal variations in earnings to the extent allowed under sound accounting and management principles. Koch (2001) defined income smoothing as a means used by the management to diminish the variability of a stream of reported income numbers relative to some perceived target stream by the manipulation of artificial (accounting) or real (transactional) variables.

Income smoothing has been a topic of interest in the accounting and finance literature for decades. In most studies, the income smoothing practice was viewed as "immoral", "cheating" and "misleading" on the part of the firm's management, (Ronen and Sadan, 2005). These studies also support the hypothesis that corporate managers often engage in income

smoothing, (Barefield and Comiskey, 2001; Barnea, Ronen and Sadan, 1995; Beidleman, 1993 and Dascher and Malcolm. 2004).

## **2- Previous Empirical Evidence**

Income smoothing has been a topic of interest among many researchers. Initially, the researchers started off with discussions and arguments as well as giving evidence on the existence of income smoothing activities. They developed various frameworks to distinguish between smoother and nonsmoothing companies, (Gordon, 1968; Imhoff, 1977 and Eckel, 1981). Gordon (1968) suggested three general methods for identifying income smoothing behavior: (1) direct ascertainment from the management through interviews, questionnaires, or observation; (2) contact with second parties such as CPA's; or (3) examination of ex-post data. However, the researchers were inclined to use the third method in determining the income smoothing practice.

Imhoff (1977) suggested that normalized earnings could be a function of an independent variable. Imhoff selected sales, as the independent variable with an assumption that sales is not subject to smoothing. He regressed income and sales on time:  $\text{Income} = \alpha + \beta (\text{time})$  and  $\text{Sales} = \alpha + \beta (\text{time})$ . He then defined variability as the size of  $R^2$  for each regression. Imhoff (1977) determine the smoothing behavior based on the following criteria: (1) smooth income stream and weak association between sales and income, or (2) a smooth income stream and variable sales stream.

Eckel (1981) proposed that (1) income is a linear function of sales; (2) the ratio of variable cost in dollar to sales remains constant over time; (3) fixed cost may remain constant or increase from one period to another but it will not decrease and (4) gross sales can only be intentionally smoothed by real smoothing and not by artificial smoothing. As a result, the coefficient of variation method was developed based on the above assumption which determines smoothing when the coefficient of variation of sales is greater than the coefficient of variation of income.

Previous studies have investigated income smoothing instruments such as dividend income, changes in accounting policies, pension costs, extraordinary items, investment tax credit, depreciation and fixed charges, discretionary accounting decisions and many other possible income

smoothing tools, (Gordon, Horwitz and Meyers, 1996; Dopuch and Drake, 1991; Archibald, 1967; Cushing, 1999; Dascher and Malcom, 2004; Barefield and Comiskey, 2001; Beidleman, 1993; Barnea, Ronen and Sadan, 1995; and Ronen and Sadan, 2005 and Brayshaw and Eldin, 2006). Gordon, Horwitz and Meyers (1996) examined the relationship between the method of accounting for investment tax credits (income smoothing instrument) and the growth rates of earnings per share and the returns on the stockholders' equity (income smoothing objectives). Their results indicated a significant relationship between the two, suggesting the existence of income smoothing practices.

Archibald (1967) studied on depreciation methods and Cushing (1999) on accounting changes. Dascher and Malcom (2004), Barnea, Ronen and Sadan (1995), and Ronen and Sadan (2005) who studied on extraordinary items also reported income smoothing behavior among sample companies. Beidleman (1993) provided evidence to show that incentive compensation, pension and retirement expenses, research and development costs, sales and advertising expenses were also used by companies to smooth income. Copeland (1998) and Ronen and Sadan (2005) also tested different smoothing instruments and found significant income smoothing behavior. Ma (1999) concluded that banks used loan loss provisions and charge-offs to smooth income while Brayshaw and Eldin (2006) claimed that the management used exchange differences to achieve the same objective. On the other hand, Dopuch and Drake (1991) investigated the amounts of capital gains/losses from the sale of investments and could not detect any significant income smoothing. Conclusions of no income smoothing were also reached by White (1970) in his study of discretionary accounting decisions and Copeland and Licastro (1998) in their study of accounting for unconsolidated subsidiaries. However, Barefield and Comiskey (2001) who later studied the accounting for unconsolidated subsidiaries and found some evidence of companies smoothing their income.

Several researchers have come out with different argument on determining the income smoothing objective. Copeland (1998) suggested that net income as the ultimate aim of income smoothing. On the other hand, Imhoff (1981) proposed that possible measures of income smoothing include fully diluted EPS, net income, net income before extraordinary items,

operating income and gross margin. Beattie et. al (1994) claimed that profit before tax as the income smoothing objective. In a more recent study conducted by Michelson, Jordon-Wagner and Wootton (2000), they assumed operating income after depreciation, pretax income, income before extraordinary items and net income as smoothing objectives. Although the previous researchers did not come to a mutual agreement, all the researchers agreed that the smoothing objective is the profit above the line.

Several studies have also looked at possible determinants of income smoothing such as company size, industrial sector, bonus schemes, barrier to entry, and ownership, (Smith, 1976; Kamin and Ronen, 1998; Ronen and Sadan, 2005; Belkaoui and Picur, 1984; Albrecht and Richardson, 1990; Moses, 1997 and Ashari *et. al*, 1994). For example, Smith (1976) and Kamin and Ronen (1998) pointed out that, compared to owner-controlled companies, the manager-controlled ones tended to smooth income significantly more frequently. Ronen and Sadan (2005) concluded that companies in different industries smoothed their income in varying degrees. In particular, a high degree of smoothing was found in the oil and gas, and drug industries, both of which were very much under public scrutiny. Belkaoui and Picur (1984) also reached a similar conclusion long ago. They found that companies in peripheral industrial sectors showed a greater incidence of income smoothing behavior than companies in the core industrial sectors. Moses (1997) found that income smoothing was associated with company size, the divergence of actual earnings from expectations, and the existence of bonus compensation plans. Ashari *et. al* (1994) found income smoothing is greater in less profitable companies and the income smoothing is associated with the company size, the industry and the nationality of the companies.

In a more recent study, Michelson, Jordon-Wagner and Wootton (2000) tested whether the stock market response to accounting performance measures is related to the smoothness of companies' reported earnings. They found that companies that report smoother incomes have significantly higher cumulative average abnormal returns than firms that do not. They also found that there is a strong significant relationship between cumulative abnormal returns, income smoothing, firm size, and industry.

### 3- Research Methodology

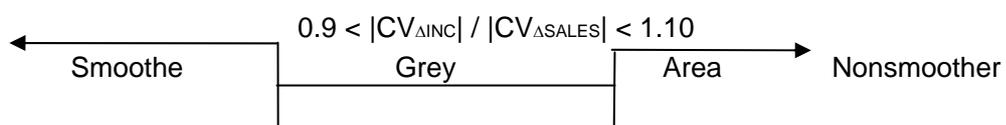
This study was conducted on companies listed on the main board of the Tehran Stock Exchange (TSE). 200 companies listed between the periods of 1999 to 2005 were selected as a sample. This seven-year period was chosen to minimize classification error. As suggested by Copeland (1998), a four-to-six year time horizon is adequate to minimize classification error. The corporate reports of these companies were scrutinized and gathered from TSE library.

The accounting year-end market prices were collected from the corporate handbook, Meta stock and investors' digest. Firms of which complete data were not available for any of the required variables were considered as missing data and eliminated from the study. This study excluded all companies classified under the finance sector of the Tehran Stock Exchange because of their unique features and business activities. Apart from this, the companies that had been delisted within the studied period were also excluded. The companies that were listed later than 2005 were not included in the population as well.

### 4- Income Smoothing Detector

This research employed the coefficient of variation method developed by Eckel (1981) to determine the presence of income smoothing. In this method, the coefficient of variations is used to measure the variability of sales and income. This method has been used by many previous studies in determining the presence of income smoothing, (Albrecht and Richardson, 1990; Ashari, Koh, Tan and Wong, 1994; Booth, Kallunki, and Martikainen, 1995; Michelson, Jordan-Wagner, and Wootton, 2000 and Michelson, Jordan-Wagner, and Wootton, 2005).

However, this research modified the above model by excluding companies with a coefficient of variation of income per coefficient of variation of sales between 0.90 to 1.10 as under grey area. This procedure is taken to reduce classification errors. Income smoothing practices is present when:



Where  $\kappa$  *INC* denotes one period change in income,  $\kappa$ *SALES* represents one period change in sales and *CV* is the coefficient of variation. For companies with a coefficient of variation of income per coefficient of variation of sales of more than 1.10 were classified as nonsmoother. This method measures income smoothing by aggregating the effects of potential smoothing variables and considering them over time. This method is consistent with the idea that companies select accounting procedures, not independently, but based on their overall expected effects on income (Zmijewski and Hagerman, 2001). This implies that changes in income are the result of income smoothing practices.

## 5- Hypothesis 1

The first hypothesis deals with a question of whether income smoothing is associated with a firm's size. Previous studies found that firm size had an effect on income smoothing practices. However, the inconsistent findings and arguments on this matter have called forth this research. It has been suggested by Moses (1997) that larger firms may have greater incentive to smooth income rather than smaller firms. Ronen and Sadan (2005) posited that this is because larger firms are subject to greater scrutiny from the government as well as the public. Benston and Krasney (2003) stated that large fluctuation in earnings may attract the attention of regulators while Ronen and Sadan (2005) believed that large fluctuation in earnings may indicate a signal of monopolistic practices and large downward fluctuation may signal crisis and cause regulators to act. On the other hand, Albrecht and Richardson (1990) argued that since larger firms receive more analyst scrutiny, they may have a lower tendency to smooth income. However, a study conducted by Ashari *et. al* (1994), has failed to detect any significant association between the smoothing practices and the size of firms. More recent findings by Michelson, Jordan-Wagner and Wootton (2000) found that smoother firms are larger in size than nonsmoothing firms. In this study, firm size is measured by their total asset. The alternate hypothesis tested in the study can be summarized as follows: -

HA1: Smaller firms have greater propensity to smooth income

To test the above hypothesis, the univariate test, that is the t-test of differences, was performed to investigate any significant systematic differences between firms that smooth their income and firms that do not.

## **6- Hypothesis 2**

The second part of this research is to investigate whether income smoothing practices would enhance the value of the firms. Although the efficient market theory claimed that accountant would not be successful in deceiving the market using accounting techniques and transaction, however, previous researchers have come out with different arguments on how income smoothing practices can give positive implication on firm value, (Barnea, Ronen and Sadan, 1995; Ronen and Sadan, 2005; Zhemin and Williams, 1994; Trueman and Titman, 2004;). Zhemin and Williams (1994) suggest that the process of income smoothing incorporates managers' private knowledge regarding the firm's future performance. Chaney and Lewis (1995) proposed that the consistent levels of reported earnings are thought of as a way to signal a firm's quality. Thus, this knowledge would favorably affect the stockholder's wealth and at the same time reduce the perceived firm's risk. Trueman and Titman (2004) put forth the proposition that income smoothing would lower the cost of debt and the possibility of bankruptcy. As a result, the firm's value would increase. The idea was then extended by Beattie et al. (1994), who proposed that smoother income lessens the probability of financial ratio covenants and reduces the expected cost of default and renegotiation. Hepworth (1993) stated that owners would feel more confident towards a company that reports stable earnings. This is agreed by Gordon (1996), who suggested that the management should smoothen the reported income since the stockholders' satisfaction increases with the growth rate and stability of its income. A smoother level of income leads to higher dividend rate and higher stock prices. On the other hand, Beidleman (1993) contended that income smoothing widens the market for a company's shares and favorably affects the firm's value. Badrinath, Gay and Kale (1999) found that institutional investors normally avoid companies that experience large variations in earnings or firms that are perceived as risky. Therefore, institutional investors tend to prefer companies with smoother earnings streams. On the other hand, Dye (1998) claimed that prospective

investors' perceptions of the firm's value can be influenced by using the income smoothing practice. Barnea, Ronen and Sadan (1995) and Ronen and Sadan (2005) claimed income smoothing enhance investors' ability to predict future cash flows.

Thus, this research investigates whether income smoothing practice would enhances the firm's value. The alternate hypothesis of this study can be stated as follows:-

HA2: Income smoothing practices are positively associated with the firm's value

To test the hypothesis, an ordinary least square (OLS) regression was conducted on the following model.

$$MVE_{jt} = \beta_0 + \beta_1 INC_{jt} + \beta_2 SMOOTHER_{jt} + e_{jt}$$

Where:

MVE<sub>jt</sub> = Market value of shareholders' equity of firm j at year t

INC<sub>jt</sub> = Profit before tax of firm j at year t

SMOOTHER<sub>jt</sub> = 1=smoother, 0= Nonsmoother

β<sub>0</sub> = Intercept value

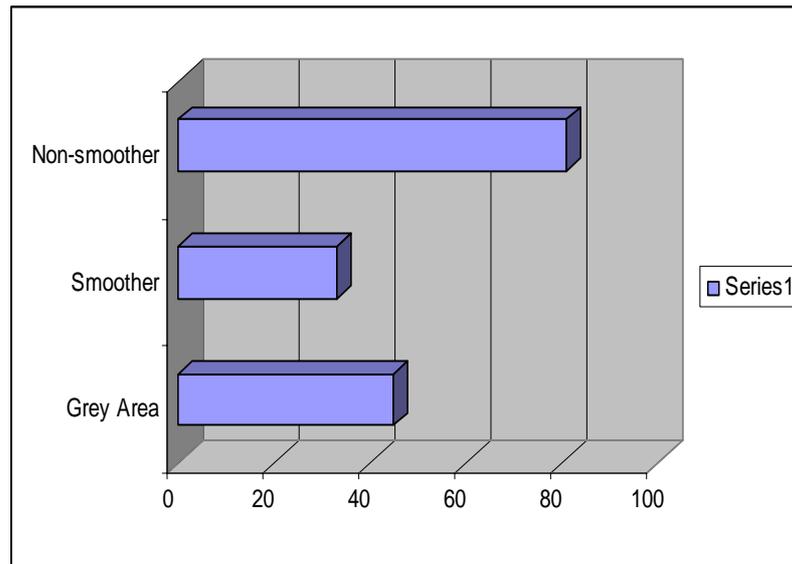
β<sub>1</sub>, β<sub>2</sub> = Coefficient for variable 1, 2

e = Error

## Findings

### Descriptive Statistics

Figure 1 represents results of the classification process undertaken to differentiate between smoother and nonsmoother firms by using the coefficient of variation method. From the 200 firms studied, only 159 firms are available for analysis. The remaining was excluded due to incomplete set of data. To reduce the classification errors, this study classifies the firms with the ratio of coefficient of variation of sales per coefficient of variation of income between 0.9 and 1.1 as in the gray area.



**Figure 1: Smoothing Status Classification**

This figure shows the presence of income smoothing activities in Iran. The findings also show that the number of smoothing firms was smaller compared to non-smoothing firms where 81 firms are classified as non-smoother and 33 firms as smoother. The result also classified 45 firms to be in the grey area. These findings on the presence of income smoothing practices in Iran are consistent with Ashari et. al's (1994) findings. However, the number of income smoother is lower compared to nonsmoother and the total sample.

### **Income Smoothing And Firms Size**

The first hypothesis attempts to test whether larger firms have a greater tendency to smooth income.

**Table 1: One Tail T-Test (Firms Size and Income Smoothing Status)**

					t-value
1999	Smoother	287,726	435,057	33	2.164
	Nonsmoother	602,783		81	(0.031)
2000	Smoother	192,147	313,284	33	2.015
	Nonsmoother	425,431		81	(0.021)
2001	Smoother	257,207	347,532	33	1.015
	Nonsmoother	522,764		81	(0.019)
2002	Smoother	322,567	345,987	33	2.088
	Nonsmoother	755,777		81	(0.019)
2003	Smoother	445,675	321,309	33	1.773
	Nonsmoother	783,200		81	(0.031)
2004	Smoother	423,701	952,673	33	2.552
	Nonsmoother	934,445		81	(0.007)
2005	Smoother	388,943	631,532	33	2.323
	Nonsmoother	1,026,967		81	(0.012)

The above table indicates that smaller firms have a greater tendency to smooth their income. The mean of total net assets shows that smoother firms are smaller in size compared to nonsmoother firms throughout the period under study, which is from 1999 to 2005. The table also shows that the mean differences between the sizes of the two groups are significant, at least at 5% level. The one-tail t-test results reject the null hypothesis. This result is consistent with Albrecht's (1990), who claims that smaller firms have greater tendency to smooth income rather than bigger firms. However, this is contradictory to Ronen and Sadan's (2005) suggestion that the larger firms have greater propensity to smooth income than smaller firms.

### **Income Smoothing Practices And Firms Value**

The empirical analysis for the hypothesis was based on the net income model, which was introduced by Barth *et al.* (1992). The income statement model was modified for the purpose of this study by incorporating a dichotomous variable for smoothing status. The smoothing companies were labeled as '1' while the nonsmoothing companies were labeled as '0'.

The model tested in this study was:

$$MVE_{jt} = \beta_0 + \beta_1 NI_{jt} + \beta_2 SMOOTHER_{jt} + e_{jt} \quad (1)$$

Panel A of Table 1 shows that the t-ratio of the dichotomous variable is insignificant at 5% ( $\alpha < 0.05$ ) level, which means that there is no significant association between the smoothing status and the value of the firms.

### **Collinearity Issue**

The collinearity problem may reduce any single independent variable's predictive power by the extent to which it is associated with other independent variables. The result of the previous test divulges a probability of collinearity problem. According to Gujarati (1995), the high value of R-squared and the insignificant value of the dichotomous variable are symptoms of the problem. Theoretically, the net income and the smoothing status may probably have a correlation.

According to Gujarati (1995), the collinearity and multicollinearity problem can be overcome by dropping one or more variables from the equation. Our primary concern is on the smoothing status. Therefore, the net income is dropped from the regression to verify whether there are any changes in the significant value of the dichotomous variable. The exclusion of the first independent variable eliminates any collinearity problem.

The new adjusted model was as follows: -

$$MVE_j = b_0 + b_1 SMOOTHER_j + e_j \quad (2)$$

Although there are changes in the coefficient of dichotomous variable and the t-ratio, the values are still insignificant. These results are shown in Panel B. Another test using the correlation matrix shows a Pearson

correlation of 0.416 between the independent variables. Therefore, it can be concluded that there is a low correlation between the independent variables.

### **Heteroscedasticity Issue**

This research is also concerned with heteroscedasticity problem that often arises when conducting a cross-sectional analysis. According to Ibrahim (1999), one of the major econometric problems when estimating cross-sectional valuation models is the problem of heteroscedastic disturbances that arise due to the fact that large firms tend to produce large disturbances and vice versa. Gujarati (1995) warned that if heteroscedasticity is present, then the usual OLS estimators, although unbiased, will no longer exhibit minimum variance among all linear unbiased estimators. In short, they are no longer the best linear unbiased estimator (BLUE).

Therefore, it was necessary to test the heteroscedasticity assumption for the basic models in order to determine whether the variance of the residuals in the basic models was constant throughout the sample. Symbolically,

$$\text{Var}(\epsilon_t) = \sigma^2 \quad t = 1, 2, \dots, n$$

The diagnostic test for heteroscedasticity was reported as a part of the standard results using the Lagrange Multipliers (LM) test. The test statistic was performed by regressing the square of the residual  $\epsilon_{jt}^2$  as the dependent variable on the predictive values,  $\text{MVE}_{jt}$ . Symbolically,

$$\epsilon_{jt}^2 = \beta_0 + \beta_1 \text{MVE}_{jt} + u_{jt}$$

Table 2: Ordinary Least Square Regression Result

<b>PANEL A: BASIC MODEL</b>			
<b>MVE<sub>jt</sub> = b<sub>0</sub> + b<sub>1</sub>INI<sub>jt</sub> + b<sub>2</sub>SMOOTHER<sub>jt</sub> + e<sub>jt</sub></b>			
	<b>Constant</b>	<b>Net Income</b>	<b>Dichotomous</b>
<b>Predicted Sign</b>	x	+	-
<b>Coefficient</b>	87843.9	22.3452	323906.2
<b>Standard Error</b>	405673.3	2.6543	543908.7
<b>T-ratio</b>	0.2176	8.4761	0.28765
<b>R-Squared</b>	0.91		
<b>PANEL B: SOLVING MULTICOLLINEARITY PROBLEMS</b>			
<b>MVE<sub>j</sub> = b<sub>0</sub> + b<sub>1</sub>SMOOTHER<sub>j</sub> + e<sub>j</sub></b>			
	$\beta_0$	$\beta_1$	
<b>Predicted Sign</b>	x		
<b>Coefficient</b>	4.08E+06	4.07E+06	
<b>Standard Error</b>	1.86E+06	3.212+06	
<b>T-Ratio[Prob]</b>	2.1843***	-1.2245	
<b>R-Squared</b>	0.0031		
<b>PANEL C: ADJUSTING THE HETEROSCEDASTICITY DEFLATING BY SALES</b>			
<b>MVE<sub>jt</sub> = b<sub>0</sub> + b<sub>1</sub>INI<sub>jt</sub> + b<sub>2</sub>SMOOTHER<sub>jt</sub> + e<sub>jt</sub></b>			
<b>SALES<sub>jt</sub></b>	<b>SALES<sub>jt</sub></b>		
	$\beta_0$	$\beta_1$	$\beta_2$
<b>Predicted Sign</b>	x	+	variable
<b>Coefficient</b>	84834.9	223451	331907.3
<b>Standard Error</b>	371560.2	1.0543	870654.1
<b>T-ratio</b>	0.33876	8.4761***	0.57453
<b>R-Squared</b>	0.93		
<b>PANEL D: ADJUSTING THE HETEROSCEDASTICITY WHITE'S TEROSEDASTICITY ADJUSTED S.E.'s</b>			
<b>MVE<sub>jt</sub> = b<sub>0</sub> + b<sub>1</sub>INI<sub>jt</sub> + b<sub>2</sub>SMOOTHER<sub>jt</sub> + e<sub>jt</sub></b>			
	$\beta_0$	$\beta_1$	$\beta_2$
<b>Predicted Sign</b>	x	+	-
<b>Coefficient</b>	84532.5	22.0951	325907.5
<b>Standard Error</b>	410908.5	22.0951	325907
<b>T-ratio</b>	0.2045	9.5671***	0.54789
<b>R-Squared</b>	0.90		

Notes: The table indicates significance at 1% (\*\*\*) and 10%(\*) levels.

Then,  $LM = nR^2$  was calculated, in which  $\chi^2_{1,\alpha}$  with 1 degree of freedom under the null hypothesis that the error term was homoscedastic

where  $n$  and  $R^2$  were the sample size and coefficient of determination respectively, obtained from the above regression.

Based on the regression of squared residuals on squared fitted values, the CHSQ of 68.46 and  $p$  value of 0.000 were found. Thus, there is evidence that the variance of the residuals was not constant in the sample. In short, the diagnostic tests provided evidence that heteroscedasticity problem existed.

According to Landsman (1986), to produce more efficient estimates, one can, in principle, transform the variables in a particular regression model to produce a constant (but still unknown) variance. To overcome the heteroscedasticity problem, McCarthy and Schneider (1995) and Landsman (1986) suggested that the model should be deflated by total sales.

Another procedure established by White (1980) was also carried out. This procedure, which is known as the heteroscedasticity-consistent covariance matrix estimators (HCCME), produces consistent estimates of the variances and covariance's of OLS estimators even if there is heteroscedasticity problem.

Panel C and D show the results after adjusting to the heteroscedasticity problem. Consistent and robust results were later found. This implies that the investor did not grant extra value for the smoothing firms. Although previous studies collaboratively contended that income smoothing would enhance a firm's value, it is inconclusive as far as Iranian firms are concerned. However, the results show a significant relationship between firm's value and earnings. In other words, the market is more concerned about the magnitude of earnings rather than the earnings stream.

## **Conclusions**

The purpose of this research is to test the proposition that income smoothing would favorably affect the firm's value. Analysis from the sample companies listed on the Tehran Stock Exchange using the coefficient of variation method has manifested the presence of income smoothing practices in Iran. The ordinary least square regression run on the model demonstrated that income smoothing practice is not associated with firm's value.

Further tests conducted, with due consideration of the econometric problems that may distort the accuracy of the result, led to the same conclusion. However, the results show that valuation of firms is significantly

associated with the magnitude of earnings rather than the earnings stream. Future research may be conducted by incorporating other variables, differentiating between real and artificial smoothing as well as adjusting the effect of economic situation and a different stock exchange.

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