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# Financial ratios between fraudulent and non-fraudulent firms: Evidence from Tehran Stock Exchange

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Fraud is a broad concept with two basic types seen in practice. The first is the misappropriation of assets and the second is fraudulent financial reporting. Fraudulent financial reporting usually occurs in the form of falsification of financial statements in order to obtain some forms of benefit. The current research compares the financial ratios between fraudulent and non-fraudulent firms for the companies listed on Tehran Stock Exchange. The sample consists of 134 companies from 2009-2014 and for testing the hypothesis Independent sample t-test was exerted. The results show that there is a significant difference between the means of Current Assets to Total Assets, Inventory to Total Assets and Revenue to Total Assets ratios. This means that management of fraud firms may be less competitive than management of non-fraud firms in using assets to generate revenue. Management may manipulate inventories. The company may not match sales with corresponding cost of goods sold, thus increasing gross margin, net income and strengthening the balance sheet. In addition, manipulation of inventory is in form of reporting inventory lower than cost or market value, and companies choosing not to record the obsolete inventory. Higher or lower margins are related to the issuing of fraudulent financial reporting. In addition, the results show that there is not a significant difference between the means of Total Debt to Total Equity, Total Debt to Total Asset, Net Profit to Revenue, Receivables to Revenue and Working Capital to Total Assets ratios.

**Key words:** Fraud, fraudulent financial reporting, financial ratio.

## INTRODUCTION

Financial fraud is a broad legal concept, however, covering a wide range of activities. The American Institute of Certified Public Accountants<sup>i</sup> (Statement on Auditing Standards<sup>ii</sup> No. 82) and the USA Government Accountability Office have defined two types of financial misstatement. The first, known as management fraud, arises from intentional misstatements or omissions of amounts and disclosures in financial statements. These are perpetrated by management with the intent to

deceive. The second arises from the misappropriation of assets, and is known as employee fraud or defalcation. The majority of research on fraudulent financial reporting models focuses on the first type of fraud (Persons, 1995). Fraudulent financial reporting is one type of fraud with substantial negative impacts, loss of investor confidence, reputational damage, potential fines and criminal actions (Ernst and Young, 2009). Fraudulent financial reporting may result from an attempt to hide other acts of corporate

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fraud or be perpetrated to improve the company's financial appearance (Hasnan et al., 2013). Fraudulent financial reporting is more likely to occur in companies experiencing financial difficulties than in normal companies (Beasley et al., 1999; Kinney and McDaniel, 1989; Mishra and Drtina, 2004).

Such fraudulent reporting is a critical problem for external auditors, both because of the potential legal liability for failure to detect false financial statements and because of the damage to professional reputation that results from public dissatisfaction about undetected fraud (Kaminski et al). SAS No. 53 was designed to narrow the gap between clients' expectations regarding the auditor's responsibility to detect fraud during an audit and what that responsibility actually is (Levy, 1989: 52). SAS No. 82, Consideration of Fraud in a Financial Statement Audit, provides guidance on the auditor's responsibility to "plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether caused by error or fraud" (Bell and Carcello, 2000).

Howe (1999) suggested that firms turn to fraudulent financial reporting when they have already taken advantage of the most aggressive Generally Accepted Accounting Principles<sup>iii</sup>.

"Analysis of ratios of account balances is a widely applied attention-direction procedure, yet little is known of the ability of ratio analysis to identify material monetary error in actual accounting data" (Kinney, 1987: 60). Such financial analysis is frequently posited to be a useful tool for identifying irregularities and/or fraud (Thornhill, 1995). For example financial leverage, capital turnover, asset composition and firm size are associated with fraudulent financial reporting (Persons, 1995).

Fraud detection is one of the specific tasks assigned to auditors as stated in International Standards on Auditing<sup>iv</sup> 240. Auditors commonly use tools known as analytical procedures to assist them in detecting fraud (Thornhill, 1995; Albrecht et al., 2009). "The Treadway Commission recommended that the ASB Security requires the use of analytical procedures on all audits to improve the detection of fraudulent financial reporting" (Wheeler and Pany, 1996: 558). Analytical procedure is the name used for a variety of techniques the auditor can use to assess the risk of material misstatements in financial records. These procedures involve the analysis of trends, ratios, and reasonableness tests derived from an entity's financial and operating data. SAS No. 56 requires that Analytical procedures be performed in planning the audit with an objective of identifying the existence of unusual events, amounts, ratios and trends that might indicate matters that have financial statement and audit planning implications (AICPA, 1988). According to SAS No. 99, the current fraud standard, the auditor should consider the results of Analytical procedures in identifying the risks of material misstatement due to fraud (AICPA, 2002). While

the procedures are well known and widely used, there is a general lack of understanding of how they are properly applied, and how much reliance should be placed on them. So, companies, auditors, and regulators have increased their focus on understanding fraudulent reporting and how to mitigate its occurrence (Liu et al., 2014).

Due to the importance of fraudulent financial reporting issue the objective of this paper is to investigate the significant differences between the mean of financial ratios of fraud and non- fraud companies.

The remainder of the paper is organized as follows: Section 2 discusses the fraudulent financial reporting and highlights the prior research, Section 3 develops eight hypotheses, and Section 4 describes the research design and methodology. Section 5 describes the results of research and finally, Section 6 provides conclusions.

## LITERATURE REVIEW

The increased focus on internal controls by organizations as a mechanism to prevent unethical behavior is consistent with the Fraud Triangle, a widely recognized framework used to understand factors that are predictive of fraudulent reporting and thereby as a means to identify ways to mitigate fraud (AICPA, 2002; The Committee of Sponsoring Organizations<sup>v</sup>, 1999). The framework of Fraud Triangle identifies three broad factors that increase the likelihood for fraud: incentives, opportunities, and rationalization. The impact of fraudulent financial reporting often goes far beyond losses for investors and selected classes of creditors. An adequate economic and ethical analysis requires consideration of the outcomes of unethical behavior on multiple stakeholders, and even the ripple effect on the economy and society as a whole (Kalbers, 2009).

Fraudulent financial reporting by businesses is a matter of grave social and economic concern and it has become an increasingly important issue to the accounting profession, as well as to society general (Cox and Weirich, 2002).

One problem with financial reporting is the restatement of financial statements. Restatements generally result from material errors in financial statements that are discovered some time after being issued. Restatements may result from fraud, but also may originate from various types of errors, including misinterpretation of accounting principles. While these errors may not be intentional, the quality of reporting and the adequacy of controls over the financial reporting process are called into question (Kalbers, 2009) (Table 1).

Most of the above studies investigate the financial ratios between fraudulent and non-fraudulent firms with logistic Regression. In this research we used the t- test method for highlighting the differences of ratios between fraudulent and non-fraudulent firms.

**Table 1.** Finding prior research survey in scope of fraudulent financial reporting.

Author(s)	Year	Country	Results
Persons	1995	N/A	In total, ten variables, including eight ratios, were examined and used to develop two predictive logistic models. One model was for the fraud year and the other was for the preceding year. Stepwise-logistic models indicated that financial leverage, capital turnover, asset composition and firm size were significant factors influencing the likelihood of fraudulent financial reporting.
Spathis	2002	Greece	Ten financial variables are selected for examination as potential predictors of fraudulent financial reporting. Univariate and multivariate statistical techniques such as logistic regression are used to develop a model to identify factors associated with fraudulent financial reporting. The model is accurate in classifying the total sample correctly with accuracy rates exceeding 84 per cent.
Kaminski et al.	2004	N/A	The fraudulent firms were matched with non-fraudulent firms. Using this matched-pairs design, ratio analysis for a seven-year period was conducted on 21 ratios. Overall, 16 ratios were found to be significant. Of these, only three ratios were significant for three time periods. Of the 16 statistically significant ratios, only five were significant during the period prior to the fraud year. Using discriminant analysis, misclassifications for fraud firms ranged from 58 percent to 98 percent.
Grove and Basilico	2008	N/A	For identifying both fraud and non-fraud one year before the frauds became public knowledge, this model had overall 76 percent accuracy with 14 percent Type I errors and 10 percent Type II errors. Three ratios in the model really drove these results: the gross margin index, the sales growth index, and the accounts receivable index.
Dani et al.	2013	Malaysia	The study tests eleven financial ratios. The logistic regression was used. The results show that all the financial ratios have significant relationships with fraudulent financial reporting except for Gross Profit-to-Assets ratio, percentage of Inventory-to-Total Assets, Gross Margin Index and Z-Scores.
Amaechi and Nnanyereugo	2013	Nigeria	Logistic Regression was used in analyzing data. The study revealed 16 significant ratios out of 29 financial ratios used for the study as being capable of aiding detection of fraud in the financial statements.
Dalnial et al.	2014	Malaysia	Investigate whether there are any significant differences between the means of financial ratios of fraudulent and non-fraudulent firms and to identify which financial ratio is significant to detect fraudulent reporting. The study found that there are significant mean differences between the fraud and non-fraud firms in ratios such as total debt to total equity, account receivables to sales. In addition, Z score which measures the bankruptcy probability is significant to detect fraudulent financial reporting.

## Hypotheses development

This study expects that there is difference between the means of some financial ratios between fraudulent and non-fraudulent firms. Hence, the following hypothesis is proposed:

**H<sub>1</sub>:** There is a significant difference between the means of the Total Debt to Total Equity ratio between fraudulent and non-fraudulent firms.

**H<sub>2</sub>:** There is a significant difference between the means of the Total Debt to Total Asset ratio between fraudulent and non-fraudulent firms.

**H<sub>3</sub>:** There is a significant difference between the means of the Net Profit to Revenue ratio between fraudulent and non-fraudulent firms.

**H<sub>4</sub>:** There is a significant difference between the means of the Current Assets to Total Assets ratio between fraudulent and non-fraudulent firms.

**H<sub>5</sub>:** There is a significant difference between the means of the Receivables to Revenue ratio between fraudulent and non-fraudulent firms.

**H<sub>6</sub>:** There is a significant difference between the means of the Inventory to Total Assets ratio between fraudulent and non-fraudulent firms.

**H<sub>7</sub>:** There is a significant difference between the means of the Working Capital to Total Assets ratio between fraudulent and non-fraudulent firms.

**H<sub>8</sub>:** There is a significant difference between the means of the Revenue to Total Assets ratio between fraudulent and non-fraudulent firms.

## Population and sampling

The population of this study consists of firms listed in Tehran Stock Exchange (TSE). However, due to high volume of population and heterogeneity among firms listed in TSE, following conditions are considered:

1. Firm's fiscal year must be ended at the end of year and they have not changed their fiscal year during studied period.

2. The needed information must be available.

By applying these restrictions, 134 companies during the

period 2008-2014 were selected.

## METHODOLOGY

This work can be classified as a descriptive study regarding its objectives, as our aim is to observe record, analyze and correlate facts and phenomena without manipulating them. The information of the companies was collected through devise processor software and formal website of the Stock Exchange (www.rdis.ir and www.codal.ir). Finally, data were prepared using Excel software and then the final analysis was performed using SPSS 21 software.

### Measuring fraudulent financial reporting

The extent of likelihood of fraudulent financial reporting is measured by combining two models in measuring red flags for the likelihood earning management. The models are Z-score bankruptcy prediction model and Beneish M-score model. The Z-score model that has been developed by Altman (1968) is a proxy for financial distress risk or bankruptcy risk, where these risks could be an early warning sign for potential collapse that will lead to the occurrence of fraud or manipulation in an organization. Meanwhile, Beneish M-score model that was developed by Beneish (1999) is similar to the Altman Z score, but it is optimized to estimate the probability of manipulation rather than bankruptcy (Beneish, 1999). Therefore, using these two models, the likelihood of fraudulent financial reporting in an organization could be determined (Razali and Arshad, 2014).

### ALTMAN Z-score

$Z = 1.2$  (working capital/total assets) +  $1.4$  (retained earnings/total assets) +  $3.3$  (earnings before interest and taxes/ total assets) +  $0.06$  (market value of equity/book value of total debt) +  $1.0$  (sales/total assets)

The level of financial distress had been classified in three zones of discrimination. Z-scores that are less than 1.81 is an indicator that the organization is in the "distress" zone, scores between 1.81 and 2.99 indicate that the organizations were in the "grey" zone, and for scores that are more than 2.99, it is an indicator that the organization is in the "safe" zone (Razali and Arshad, 2014).

### Definition of "BENEISH MODEL"

It is a mathematical model that uses financial ratios to identify whether a company has manipulated its earnings. The variables are constructed from the data in the company's financial statements and, once calculated, create an M-Score to describe the degree to which the earnings have been manipulated.

These variables are:

1. DSRI - Days' sales in receivable index
2. GMI - Gross margin index
3. AQI - Asset quality index
4. SGI - Sales growth index
5. DEPI - Depreciation index
6. SGAI - Sales and general and administrative expenses index
7. LVGI - Leverage index
8. TATA - Total accruals to total assets

According to Beneish (1999) these variables calculated are as below:

$$DSRI = \frac{\text{Receivables}_t / \text{Sales}_t}{\text{Receivables}_{t-1} / \text{Sales}_{t-1}}$$

$$GMI = \frac{(\text{Sales}_{t-1} - \text{Cost of goods sold}_{t-1}) / \text{Sales}_{t-1}}{(\text{Sales}_t - \text{Cost of goods sold}_t) / \text{Sales}_t}$$

$$AQI = \frac{(1 - \text{Current asset}_t + \text{PP\&E}) / \text{Total assets}_t}{(1 - \text{Current asset}_{t-1} + \text{PP\&E}_{t-1}) / \text{Total assets}_{t-1}}$$

$$SGI = \frac{\text{Sales}_t}{\text{Sales}_{t-1}}$$

$$DEPI = \frac{\text{Depreciation}_{t-1} / (\text{Depreciation}_{t-1} + \text{PP\&E}_{t-1})}{\text{Depreciation}_t / (\text{Depreciation}_t + \text{PP\&E}_t)}$$

$$SGAI = \frac{\text{Sales, general, and administrative expense}_t / \text{Sales}_t}{\text{Sales, general, and administrative expense}_{t-1} / \text{Sales}_{t-1}}$$

$$LVGI = \frac{(\text{LTD}_t + \text{Current liabilities}_t) / \text{Total assets}_t}{(\text{LTD}_{t-1} + \text{Current liabilities}_{t-1}) / \text{Total assets}_{t-1}}$$

$$TATA = \frac{\Delta \text{Current assets}_t - \Delta \text{Cash}_t - \Delta \text{Current liabilities}_t - \Delta \text{Current maturities of LTD}_t - \Delta \text{Income tax payable}_t - \text{Depreciation and amortization}_t}{\text{Total assets}}$$

Once calculated, the eight variables are combined together to achieve an M-Score for the company. An M-Score of less than -2.22 suggests that the company will not be a manipulator. An M-Score of greater than -2.22 signals that the company is likely to be a manipulator.

$$M\text{-Score} = -4.84 + .920 * DSRI + .528 * GMI + .404 * AQI + .892 * SGI + .115 * DEPI + .172 * SGAI + 6.679 * TATA - .327 * LVGI$$

### Test method

In this study the Independent sample t-test was used. Given the matched-pairs design, paired-sample t tests were conducted for each variable to determine if the mean of the fraud sample was significantly different than the mean of the non- fraud sample.

### Measurement of variables

#### Likelihood of fraudulent financial reporting

In this study, Likelihood of fraudulent financial reporting is based on an integration of Beneish M-score model and Altman's Z-score model.

#### Financial ratio

These ratios are financial leverage, profitability, asset composition, liquidity and capital turnover.

#### Financial leverage

This is Total Debt to Total Equity and also Total Debt to Total Asset. Leverage is also referred to as gearing. It is where a relationship exists between a firm's liabilities and its assets; that is the total debts used to finance the firm's assets. Leverage is also used to measure the firms' ability to repay its financial obligations as they mature (Alkhatib and Marji, 2012). Higher leverage is typically associated with a higher potential for violations of loan agreements and a reduced ability to obtain additional capital through borrowing (Dalnial et al., 2014).

**Table 2.** Independent sample t-test (Hypothesis 1).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Total Debt / Total Equity	Non Fraudulent	2.0449296	9.36778800	1.370	.124
	Fraudulent	3.3693926	19.60781763		

**Table 3.** Independent sample t-test (Hypothesis 2).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Total Debt / Total Asset	Non Fraudulent	.6814299	.27046923	1.605	.533
	Fraudulent	.7134140	.25369296		

**Table 4.** Independent sample t-test (Hypothesis 3).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Net Profit / Revenue	Non Fraudulent	12.3288508	22.97246392	-1.342	.657
	Fraudulent	10.0137866	22.57918083		

**Table 5.** Independent sample t-test (Hypothesis 4).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Current Assets / Total Assets	Non Fraudulent	.6505163	.19690997	1.418	.074*
	Fraudulent	.6708291	.17494789		

\* P &lt; 0.1.

**Profitability**

Profitability is measured by Net Profit to Revenue. Profitability is a financial ratio that is used as an assessment technique in order to evaluate the capability of a company to generate earnings (Alkhatib and Marji, 2012). Lower profits may provide management with an incentive to overstate revenues or understate expenses (Dalnial et al., 2014).

**Asset composition**

Asset Composition is measured by Current Assets to Total Assets, Receivables to Revenue and Inventory to Total Assets. Beasley et al. (1999) confirm that account receivables and inventory are important variables when assessing the risk of fraud and that both are common items misstated in accounts. These variables are expected to be positive values, which show that the higher the amount of both items, the higher the risk of overstatements in the account, which leads to an increase in the likelihood of fraud.

**Liquidity**

Liquidity is measured by Working Capital to Total Assets. Firms with a very low working capital to total assets ratio indicates that they cannot meet their obligations. Thus these ratios are expected to be negative values, concluding that the lower a firm's liquidity the more likely it is for managers to engage in fraudulent financial reporting (Dalnial et al., 2014).

**Capital turnover**

Capital Turnover is measured by Revenue to Total Assets. The turnover represents the sales generating power of the firm's assets. It also measures management's ability to deal with competitive situations. Managers of fraudulent firms may be less competitive than that of non- fraudulent firms in using the firm's assets to generate sales. This inability to compete successfully may be an incentive for engaging in fraudulent financial reporting (Dalnial et al., 2014).

**EMPIRICAL RESULTS**

Tables 2-9 present the mean values, standard deviations, t-test statistics and P values of ratios for non – fraud and fraud firms.

Hypothesis 1: There is a significant difference between the means of the Total Debt to Total Equity ratio between fraudulent and non-fraudulent firms.

The results in Table 2 show that there is not a significant difference with  $\alpha = 5\%$  between the means of the Total Debt to Total Equity ratio between fraudulent and non-fraudulent firms.

Hypothesis 2: There is a significant difference between

**Table 6.** Independent sample t-test (Hypothesis 5).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Receivables / Revenue	Non Fraudulent	1.2525591	2.56621442	4.091	.389
	Fraudulent	2.0555793	2.77339994		

**Table 7.** Independent sample t-test (Hypothesis 6).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Inventory / Total Assets	Non Fraudulent	.2512581	.13683605	-1.819	.016*
	Fraudulent	.2331574	.12113397		

\* P &lt; 0.05.

**Table 8.** Independent sample t-test (Hypothesis 7).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Working Capital / Total Assets	Non Fraudulent	.0756863	.25286050	-1.406	.409
	Fraudulent	.0491164	.25087640		

**Table 9.** Independent sample t-test (Hypothesis 8).

Variables	Company type	Mean	Std. Deviation	t-statistics	p-value
Revenue / Total Assets	Non Fraudulent	.2434078	.38771550	-2.968	.009*
	Fraudulent	.1649212	.23307373		

\* P &lt; 0.05

the means of the Total Debt to Total Asset ratio between fraudulent and non-fraudulent firms.

The results in Table 3 show that there is not a significant difference with  $\alpha = 5\%$  between the means of the Total Debt to Total Asset ratio between fraudulent and non-fraudulent firms.

Hypothesis 3: There is a significant difference between the means of the Net Profit to Revenue ratio between fraudulent and non-fraudulent firms.

The results in Table 4 show that there is not a significant difference with  $\alpha = 5\%$  between the means of the Net Profit to Revenue ratio between fraudulent and non-fraudulent firms.

Hypothesis 4: There is a significant difference between the means of the Current Assets to Total Assets ratio between fraudulent and non-fraudulent firms.

The results in Table 5 show that there is a significant difference with  $\alpha = 10\%$  between the means of the Current Assets to Total Assets ratio between fraudulent and non-fraudulent firms.

Hypothesis 5: There is a significant difference between the means of the Receivables to Revenue ratio between fraudulent and non-fraudulent firms.

The results in Table 6 show that there is not a significant difference with  $\alpha = 5\%$  between the means of the Receivables to Revenue ratio between fraudulent and non-fraudulent firms.

Hypothesis 6: There is a significant difference between the means of the Inventory to Total Assets ratio between fraudulent and non-fraudulent firms.

The results in Table 7 show that there is a significant difference with  $\alpha = 5\%$  between the means of the Inventory to Total Assets ratio between fraudulent and non-fraudulent firms.

Hypothesis 7: There is a significant difference between the means of the Working Capital to Total Assets ratio between fraudulent and non-fraudulent firms.

The results in Table 8 show that there is not a significant difference with  $\alpha = 5\%$  between the means of the Working Capital to Total Assets ratio between fraudulent

and non-fraudulent firms.

Hypothesis 8: There is a significant difference between the means of the Revenue to Total Assets ratio between fraudulent and non-fraudulent firms.

The results in Table 9 show that there is a significant difference with  $\alpha = 5\%$  between the means of the Revenue to Total Assets ratio between fraudulent and non-fraudulent firms.

## Conclusion

The objective of this paper is to investigate the significant differences between the mean of financial ratios of fraud and non-fraud companies. For testing the hypothesis, the Independent sample t-test was used.

The results of hypotheses test show that there is a significant difference between the means of the Current Assets to Total Assets ratio, Inventory to Total Assets ratio and Revenue to Total Assets ratio between fraudulent and non-fraudulent firms. These findings are similar to previous reports (Feroz et al., 1991; Dani et al., 2013; Dalnial et al., 2014).

And also, the result that there is not a significant difference between the means of the Net Profit to Revenue ratio between fraudulent and non-fraudulent firms is consistent with the research of Dalnial et al. (2014).

The ratios on Revenue / Total Assets measure the capital turnover, represent the Revenue generating power of firm's assets and measure management's ability to deal with competitive situations. Persons (1995) argued that management of fraud firms may be less competitive than management of non-fraud firms in using assets to generate revenue. This may provide them opportunity to engage in fraudulent financial reporting and sign of this ratio should be negative. Further, Summers and Sweeney (1998) indicate that fraudulent financial statements are detected by looking at the behavior of the management who tend to reduce purchases on their common stocks to enhance revenue.

Net Profit / Revenue ratio is used to measure a company's financial health and profitability. Net profit should be positive and higher enough to cover all the expenses. It helps investors to predict the future performance stocks in the market. Positively, high Net Profit to Revenue indicates that the company is financially doing well and investors benefits from investing in that company. Net Profit represents the company's entire sales revenue minus the cost pays to manufacture the sales goods or cost of goods sold. Another issue examined in Spathis (2002) is whether the higher or lower margins are related to the issuing of fraudulent financial reporting, and for that purpose the ratio of Net Profit / Revenue is used.

Persons (1995) stated that examinations of fraud firms' financial statements seem to indicate that current assets of these firms consist mostly of receivables and inventories. The sign of current assets/ total assets is expected to be positive and the result found fraud firms have higher of this variables than non-fraud firms. Similar with Persons (1995), Spathis (2002) argued that management may manipulate inventories. The company may not match sales with corresponding cost of goods sold, thus increasing gross margin, net income and strengthening the balance sheet. In addition, manipulation of inventory is in form of reporting inventory lower than cost or market value and companies choosing not to record the obsolete inventory.

Fraudulent financial reporting firms seem to have on average higher Total Debt / Total Asset and Total Debt / Total Equity. The higher debt to equity, the lower Revenue to total assets values for the fraudulent financial reporting firms may indicate that many firms issuing fraudulent financial reporting were in financial distress (Fanning and Cogger, 1998; Summers and Sweeney, 1998). This could provide the motivation for management fraud. The ability to manipulate the values in accounts receivable was clearly reflected in the results. This is a very difficult area due to the subjective nature of estimating accounts receivable. These results suggest that additional time is necessary for auditing accounts receivable.

In addition, the results of hypotheses test show that there is not a significant difference between the means of the Total Debt to Total Equity ratio, Total Debt to Total Asset ratio, Receivables to Revenue ratio and Working Capital to Total Assets ratio between fraudulent and non-fraudulent firms. These findings are similar with the study of Spathis (2002) and Dani et al. (2013). Also, these findings are not similar to previous reports (Persons, 1995; Spathis, 2002). One reason may stem from the weakness of corporate governance in Iranian companies and the weakness of the effectiveness of audit committee that have not enough monitoring in internal controls of the companies. This is because most of these ratios are determined by board of company and the level of these ratios shows the operation of firm and board. Thus, if the corporate governance be stronger, these ratios will improve more. One of the key contributions of Loebbecke et al. (1989)'s study is that it highlighted the potential for audit committee and board governance mechanisms to reduce occurrences of financial statement fraud. Other potential reason may be that the economic circumstance is different in various countries.

Consequently, it is recommended that auditors who are eager to look into the possibility of detecting false financial statements can adopt it and save endless time in search for possible red flags. Finally, it is proposed to researchers to examine this research in different industries.

## Conflict of Interests

The authors have not declared any conflict of interests.

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<sup>i</sup> American Institute of Certified Public Accountants (AICPA)

<sup>ii</sup> Statement on Auditing Standards (SAS)

<sup>iii</sup> Generally Accepted Accounting Principles (GAAP)

<sup>iv</sup> International Standards on Auditing (ISA)

<sup>v</sup> The Committee of Sponsoring Organizations (COSO)