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# A study on the relationship between fraud and cash policies of listed companies in Tehran Stock Exchange

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**Abstract:** Today, cash as an inevitable necessity, is of interest to all corporates and institutions. In fact, cash is the most fluid and best asset of the enterprise, which if properly managed, will lead to great success for the company and if it is managed with no planning and skills, it may lead to the company bankruptcy. Falsification of financial statements, including the manipulation of their constituent elements through overstating assets, sales and profits or understating the liabilities, expenses and loss. Existing studies suggest a direct link between fraud in corporates and the corporates financing options. The aim of this study is to examine the relationship between fraud and financial liability and cash policies. For this purpose, a sample of 120 companies listed in Tehran Stock Exchange has been reviewed for the 5-year period 2009 to 2013. To verify the hypotheses, logistic regression analysis is used. Hypotheses testing results show that there is a significant relationship between the fraud (financial and tax distortions) in financial reporting and cash holdings in corporates. However, there is no significant relationship between fraud (financial, legal and tax distortions) in financial reporting and changes in corporate cash flow and cash flow volatility. There is also no significant relationship between fraud (legal distortions) in financial reporting and corporate cash holdings.

**Key words:** Fraud in Financial Reporting, Cash Policies, Theme category: JEL.

## INTRODUCTION

Recent studies show that companies have a certain amount of cash. According to the previous investigations, there are several factors that can explain the level of cash holdings. First, the transaction factor knows it certain that using cash saving, the companies can save transaction costs. Therefore, rather than being forced to liquidate the total amount, it can be paid in installments. The second reason for the company's cash holdings is based on the perspective of the institution. Managers prefer to use cash because this action can reduce risks and increase their decision-making powers[1]. Although the

empirical evidence confirms the institute reasons for using cash, the current increase in cash assets in the world is largely due to the prevention of losses or preventative reasons. Using a defensive tool known as the cash, companies tend to prevent the losses caused by a decline in the financial resources. Moreover, it has been demonstrated that the effective and important factor of tending to prevent losses will increase the market competitiveness of the industry[2]. As the companies want to prevent the investment less than usual, competition risk increase leads to an increase in cash holdings to remedy preventive purposes. With a description of the problem, the recent history emphasizes on the relationship between corporate cash holdings as a means of preventing losses in competition and production market dynamics.

When companies are facing tougher competition in the production market, they have more willing to maintain their cash flow. Corporates consider the risks that may endanger their rivals, are considered[3]. This will lead to a positive relationship between cash balances and risks of losses in the industry. In addition the impact of production market dynamics on the optimal levels of cash has proved that the policy of cash can make a huge impact on competitive outcomes. For example, firms that have high liquidity, take steps for their competitors that are financially at risk to remove them from the competition. Although empirical evidence supports the view that maintaining cash flow is useful for the corporate and is the prevention reason against losses of the corporate, cash policy has had less results[4].

Fraud and corruption in companies has increasingly turned into one of the important concerns to countries around the world. Audit's role in addressing these concerns has been critically examined. There is a growing expectation that audit institutions, through coordinate action, must play an influential role in the promotion of value-oriented culture, verity, responsibility and accountability in the implementation of the authorities and national resources usage[5]. It is important to inquire about the fraud background and detect it, because it leads to a better understanding of the concealed frauds and raises the ability of legislature and auditors to detect fraud. It can also be used as a foundation for future research. Fraud detection can widely prevent fraud in organizations, employees, shareholders and creditors. The cost of fraud can be used for market efficiency[6]. This is also useful to auditors, and they can ensure that the firms with open financial statements, customer selection, and subsequent judgments may not be cheating.

The loss of credibility and the uncertainty increase can make external financing more difficult and costly, so that creditors are likely to charge higher interest rates, and impose additional restrictions to the company[3]. Overall, the costly and limited external financing resulted from fraud may force companies to withdraw from the projects with present positive net value. This in turn leads to a gap between the company and the perspective of future prospects. To maintain liquidity and avoid the problems of insufficient investment, companies with fraudulent practices may decide for cash holdings to reduce the costs of financial crises and emphasize on internal resources of precautionary cash, such as held cash that is worthy for financing the investment. This case has been observed as a precautionary motive for holding cash[7].

Therefore, it is predicted that firms with accounting fraud hold more cash and raise cash final value after fraud disclosure, because fraud results in extremely difficult and costly access to external financing. In addition, if external financing becomes more expensive after the frauds of the companies, it is expected that companies with fraudulent practices that are financially more constrained, have saved more of their own cash flow[8].

Accordingly, it is expected that the cash flow sensitivity of cash in fraudulent companies be higher. Therefore, the purpose of this study is to investigate the interactions between financial liabilities and cash policies of companies with accounting fraud of the companies.

## LITERATURE

Sanjabi has identified the factors affecting the possibility of fraud occurrence in financial statement reporting in Iran. He categorized risk factors in four groups, and in four hypotheses, approved the inclusion of different factors in each of the four groups. In this study, questionnaires were given to the auditors and they have been asked about these factors. The results of the questionnaires were analyzed using appropriate statistical methods and consensus factors of the auditors' community have been recognized[5].

Aghai et al examined the factors affecting the cash holdings in listed companies on Tehran Stock Exchange. Their research results demonstrated that the receivable, net working capital, inventory of goods and short-term liabilities, respectively, are the most important factors that have negative impact on cash holdings. On the other hand, opportunities for firm growth, dividends, cash flow volatility and net income, respectively, are the most important factors affecting

the cash holdings. However, there is no evidence about the negative impact of long-term liabilities and firm size on cash[1].

Hasas Yeganeh and Maddahi on a study, examined the effectiveness of the audit process on detecting the important distortions in the financial statements. The research findings suggest that audit process is effective on the discovery of significant mistakes and distortions in accounting estimates and the discovery of significant mistakes and distortions resulted from non-observance of laws and regulations by the audited entity. There is also a significant difference between the sums of mistakes and distortions in the financial statements and the sums detected by the auditor. The sum of amounts reported by the auditor is primarily less than the distortions amounts[4].

Fakhari and Taghavi examined the effect of accruals quality on Corporate Cash residuals. In this study, accruals quality was measured using Decho and Dichaw. They concluded that the quality of accruals has a negative and significant correlation with cash residuals. Therefore, earnings management on cash residuals is effective. This will eventually be reflected in financial flexibility[6].

Guney et al explored the cash holding behavior in French, German, Japanese, British and American companies during the years 1996 to 2000 using data from 4069 companies. This study focused on the relationship between leverage and cash holding. The evidence of the study showed that a significant nonlinear relationship between cash holding and leverage. The results also indicate that the effect of leverage on cash holding to some extent depends on the characteristics of the countries, such as ownership concentration[9].

Chen et al in an article entitled corporate fraud, external liability and cash policies, found that the cost of corporate liability is significantly associated with corporate fraud. Due to the expensive external finance in companies with fraudulent reporting, more cash is kept to deal with negative shocks. Also, due to the precautionary motive, an increase in cash will be observed after the companies' fraud. In addition, fraud in corporates will lead to financial constraints. After the fraud in corporates, positive cash flow sensitivity to cash flow increases[10].

Chen et al (2013) investigated the relationship between financial flexibility and cash policies. The results suggest that the reduction in cash holdings can be seen more in companies with less flexibility[11].

Fazli et al in their study entitled fraud risk factors, fraud triangle, and the likelihood of fraud found that there is a significant positive relationship between

financial leverage and the ratio of sales to accounts receivable, and the possibility of fraud. The audit committee size and the ratio of non-responsible board are the factors that lead to decrease in fraud level in financial statements[12].

**RESEARCH HYPOTHESES**

This study seeks to examine the relationship between fraud and financial liability and cash policies of listed companies in Tehran Stock Exchange. To achieve this purpose with regard to theoretical principles, the research hypotheses have been formulated as following:

**The first main hypothesis:** there is a significant relationship between the fraud in financial reporting and cash holdings in the corporates.

The first sub-hypothesis: there is a significant relationship between tax distortions in financial reporting and cash holdings in the corporates.

The second sub-hypothesis: there is a significant relationship between legal distortions in financial reporting and cash holdings in the corporates.

The third sub-hypothesis: there is a significant relationship between financial distortions in financial reporting and cash holdings in the corporates.

**The second main hypothesis:** there is a significant relationship between the fraud in financial reporting and changes cash flow in the corporates.

The first sub-hypothesis: there is a significant relationship between tax distortions in financial reporting and changes cash flow in the corporates.

The second sub-hypothesis: there is a significant relationship between legal distortions in financial reporting and changes cash flow in the corporates.

The third sub-hypothesis: there is a significant relationship between financial distortions in financial reporting and changes cash flow in the corporates.

**The third main hypothesis:** there is a significant relationship between the fraud in financial reporting and cash flow volatility in the corporates.

The first sub-hypothesis: there is a significant relationship between tax distortions in financial reporting and cash flow volatility in the corporates.

The second sub-hypothesis: there is a significant relationship between legal distortions in financial reporting and cash flow volatility in the corporates.

The third sub-hypothesis: there is a significant relationship between financial distortions in financial reporting and cash flow volatility in the corporates.

**MATEREAL AND METHOD**

The method used in this study is a correlation one. This method is useful in research that aims to explore the relationship between different variables.

The present study is quasi-experimental or post-event (using past information) research that is based on the actual data of the stock market and the financial statements of companies listed in Tehran Stock Exchange. The research is in the form of cross-sectional and time-series studies since it reviews the data associated with five consecutive years and specific time periods. As the obtained results can be used in the decision-making process, this research is an applied research.

Research variables include the dependent variable, the independent variable and the control variable that are explained in the following:

**Dependent variable:**

**Fraud in Financial Reporting:**

Spatis states that when the financial statements contain a significant distortion so that the components of the financial statement do not indicate the reality, it is said that fraud has taken place[13].

So in this study to measure fraud in financial reporting, financial distortions, legal distortions, and tax distortions are used. These variables information can be seen in audit reports and legal auditors' reports of the corporates. The definition and measurement of each variable is as follows:

**Financial distortions:**

In this study, the purpose of financial distortions is the deviations of the companies from accounting and financial standards. To measure the company's conducted financial distortions, the independent auditors' report is used. If the auditor's report refers to the deviation from the accounting standards and regard to the importance of it, issues reject a conditional statement, the value one is given to the variable, and otherwise the value zero is given.

**Legal distortions:**

One of the responsibilities of the independent auditor and especially statutory examiner of the company is to check the status of laws and regulations (including business law, Czech law, etc.) compliance in the country. In case of deviation from them, auditor or statutory examiner is required to submit the report of laws and regulations non-observance to the board of Directors and the General Assembly. To present an operational definition of this variable, a dummy variable is used. So that if there is laws and regulations non-observance (laws distortion) in the report of statutory examiner or auditor, the value one is given to the variable, and otherwise the value zero is given.

**Tax distortions:**

In this study, the purpose of tax distortions is tax laws and regulations non-observance that are primarily related to tax evasion, concealment of income, etc.. Audit reports of companies are the main source of data collection related to tax distortions. So if the audit reports contain provisions regarding the corporates' tax distortions, the value one is given to the variable, and otherwise the value zero is given.

**Independent variables:**

Cash policies include:

- ✓ Cash Holdings
- ✓ Changes in Cash Flow
- ✓ Cash Flows Volatility

Cash Holdings:

$$\boldsymbol{Cash\ Holdings} = \frac{\boldsymbol{Cash + Marketable\ Securities}}{\boldsymbol{Total\ Assets}}$$

Changes in Cash Flow:

$$\boldsymbol{Changes\ in\ Cash\ Flow} = \frac{\boldsymbol{Cash\ Variations}}{\boldsymbol{Total\ Assets}}$$

Cash Flows Volatility: Cash Flow standard deviation

$$\boldsymbol{Cash\ Flows\ Volatility} = \boldsymbol{S.D}\ (\boldsymbol{Cash\ Flow})$$

**Control variables:**

**Financial leverage:** It is the ratio of book value of total liabilities to book value of total assets, which reflects the company's financial leverage[2].

**Firm size:** It is equal to the natural logarithm of total assets[2].

**Return on assets:** It is equal to the ratio of net income to total assets[3].

**The population, sample and period of the study**

The research population is companies listed on Tehran Stock Exchange for the fiscal years 2009 to 2013. In order to estimate the sample size and sampling, purposeful elimination method is used. In other words, those companies of the

population that have the following conditions are selected as the sample and the others have been removed:

1. Companies must have activity continuity during the financial year.
2. The end of their fiscal year is March
3. Companies are not among investment companies and financial intermediaries.
4. Research required information of the companies must be available.

Due to imposing these conditions, among 510 accepted companies in the Tehran Stock Exchange (their date of acceptance in Stock is before 2008), according to Cochran formula, 120 companies have been selected as the sample. The information of these companies is collected from the Tehran Stock Exchange Organization, Tehran Stock Exchange site, Eghtesad newspaper, and Rah Avard Novin and Tadbir Pardaz software.

## RESULTS

When a mass of quantitative data is collected for the study, first of all organizing and summarizing it in a way that can be understood and communicated significantly is essential. Descriptive statistics methods are used to achieve this purpose. To sum up, appropriate use of descriptive statistics methods may exactly state the features of a bunch of information. Descriptive statistics are always used to determine and express the characteristics of surveys information.

**Table 1.** Descriptive statistics for variables

| | Tax distortions | Financial distortions | Legal distortions | Financial liabilities | Cash Holdings | Cash Flows Volatility |
|---|---|---|---|---|---|---|
| **Mean** | 0.29 | 0.63 | 0.85 | 0.06 | 10.79 | 0.03 |
| **S.D** | 0.46 | 0.49 | 0.36 | 0.1 | 1.65 | 0.3 |
| **Variance** | 0.21 | 0.24 | 0.13 | 0.01 | 2.72 | 0.09 |
| **Min.** | 0 | 0 | 0 | 0 | 5.27 | -0.02 |
| **Max.** | 1 | 1 | 1 | 1.08 | 15.28 | 3.33 |

The study on descriptive results of research variables shows that the mean of the dependent variables of firms' tax, legal and financial distortions are respectively 0.29, 0.63 and 0.85. These results indicate that the majority of surveyed companies in terms of tax distortions, have less distortions, but in terms of legal and financial distortions most companies have distortions (with respect to the variables being 0 and 1). The mean of the variables of cash holdings, cash flows volatility and changes in cash flows are respectively 0.06,

10.79 and 0.03. These results suggest that most companies enjoy stable cash flow and lack of changes or very little changes in cash flow.

**Testing research variables**

- **There is a significant relationship between the fraud in financial reporting (tax distortions) and cash holdings in the corporates.**

As can be seen in Table (3) the significance level of Omnibus test for the first hypothesis (1-1) has been equal to 0.15 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of cash holdings and the dependent variable of the fraud in financial reporting (tax distortions). This variable can not have a good fit of the model. Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the cash holdings variable (3.2) shows that at 5% error level, cash holdings variable has no significant impact on the fraud in financial reporting (tax distortions) (Table 2). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained, respectively, 1.7 and 2.4 percent. These results suggest that at least 1.7 percent and at most 2.4 percent of total changes in the fraud in financial reporting (tax distortions) of companies are explained by the cash holdings variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no tax distortions is 100 percent and regard to the companies with tax distortions the model sensitivity is 2.29 percent. In general, 71.7 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (tax distortions) and changes cash flow in the corporates.**

As can be seen in Table (3) the significance level of Omnibus test for the second hypothesis (1-2) has been equal to 0.735 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of changes cash flow and the dependent variable of the fraud in financial reporting (tax distortions). This variable cannot have a good fit of the model. Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the changes cash flow variable (1.51) shows that at 5% error level, changes cash flow variable has no significant impact on the fraud

in financial reporting (tax distortions) (Table 2). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained, respectively, 0.1 and 0.1 percent. These results suggest that at least 0.1 percent and at most 0.1 percent of total changes in the fraud in financial reporting (tax distortions) of companies are explained by the changes cash flow variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no tax distortions is 100 percent and regard to the companies with tax distortions the model sensitivity is 0 percent. In general, 70.8 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (tax distortions) and cash flow volatility in the corporates.**

As can be seen in Table (3) the significance level of Omnibus test for the third hypothesis (1-3) has been equal to 0.847 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of cash flow volatility and the dependent variable of the fraud in financial reporting (tax distortions). This variable cannot have a good fit of the model. Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the cash flow volatility variable (0.02) shows that at 5% error level, cash flow volatility variable has no significant impact on the fraud in financial reporting (tax distortions) (Table 2). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained 0 percent. These results suggest that cash flow volatility variable in the companies cannot explain the fraud changes in financial reporting (tax distortions) in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no tax distortions is 100 percent and regard to the companies with tax distortions the model sensitivity is 0 percent. In general, 70.8 percent of companies are exactly classified at the fitted model.

**Table 2.** The results of the logistic regression model fitting (tax distortions)

| Variables | Regression coefficient | Standard Error | Wald statistics | Significance level |
|---|---|---|---|---|
| **Fix No.** | -1.06 | 0.25 | 17.56 | 0.00 |
| **Cash holdings** | 3.2 | 2.99 | 1.14 | 0.29 |
| **Fix No.** | -0.75 | 0.45 | 2.81 | 0.09 |
| **Changes in cash flow** | 1.51 | 4.43 | 0.12 | 0.73 |
| **Fix No.** | -1.14 | 1.34 | 0.73 | 0.39 |
| **Cash flow volatility** | 0.02 | 0.12 | 0.04 | 0.85 |

**Table 3.** The test results of fit goodness of the regression model (tax distortions)

| Index | Cash holdings | Changes in cash flow | Cash flow volatility |
|---|---|---|---|
| **Cox-Snell determination coefficient** | 1.7 | 0.1 | 0 |
| **Negel Kirk determination coefficient** | 2.4 | 0.1 | 0 |
| **Existence correct predictions percentage** | 2.9 | 0 | 0 |
| **Non-existence correct predictions percentage** | 100 | 100 | 100 |
| **Overall correct predictions percentage of the model** | 71.8 | 70.8 | 70.8 |
| **Omnibus Test** | 2.07 (0.15) | 0.115 (0.735) | 0.037 (0.847) |
| **Hosmer-Lemeshow Test** | 3.465 (0.902) | 6.3 (0.614) | 10.542 (0.229) |
| **Hypothesis result** | $H_0$ Acceptance | $H_0$ Acceptance | $H_0$ Acceptance |

- **There is a significant relationship between the fraud in financial reporting (legal distortions) and cash holdings in the corporates.**

As can be seen in Table (5) the significance level of Omnibus test for the first hypothesis (2-1) has been equal to 0.621 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of cash holdings and the dependent variable of the fraud in financial reporting (legal distortions). Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the cash holdings variable (0.24) shows that at 5% error level, cash holdings variable has no significant impact on the fraud in financial reporting (legal distortions) (Table 4). On the other hand, the values of the determination coefficients of Cox-Snell and Negel

Kirk of fitted model are obtained, respectively, 0.2 and 0.4 percent. These results suggest that at least 0.2 percent and at most 0.4 percent of total changes in the fraud in financial reporting (legal distortions) of companies are explained by the cash holdings variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no legal distortions is 0 percent and regard to the companies with legal distortions the model sensitivity is 100 percent. In general, 85 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (legal distortions) and changes cash flow in the corporates.**

As can be seen in Table (5) the significance level of Omnibus test for the second hypothesis (2-2) has been equal to 0.690 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of changes cash flow and the dependent variable of the fraud in financial reporting (legal distortions). Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the changes cash flow variable (0.16) shows that at 5% error level, changes cash flow variable has no significant impact on the fraud in financial reporting (legal distortions) (Table 4). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained, respectively, 0.1 and 0.2 percent. These results suggest that at least 0.1 percent and at most 0.2 percent of total changes in the fraud in financial reporting (legal distortions) of companies are explained by the changes cash flow variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no legal distortions is 0 percent and regard to the companies with tax distortions the model sensitivity is 100 percent. In general, 85 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (legal distortions) and cash flow volatility in the corporates.**

As can be seen in Table (5) the significance level of Omnibus test for the third hypothesis (2-3) has been equal to 0.767 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship

between the independent variable of cash flow volatility and the dependent variable of the fraud in financial reporting (legal distortions). Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the cash flow volatility variable (-0.05) shows that at 5% error level, cash flow volatility variable has no significant impact on the fraud in financial reporting (legal distortions) (Table 4). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained respectively, 0.1 and 0.1 percent. These results suggest that at least 0.1 percent and at most 0.1 percent of total changes in the fraud in financial reporting (legal distortions) of companies are explained by cash flow volatility variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no legal distortions is 0 percent and regard to the companies with tax distortions the model sensitivity is 100 percent. In general, 85 percent of companies are exactly classified at the fitted model.

**Table 4.** The results of the logistic regression model fitting (legal distortions)

| Variables | Regression coefficient | Standard Error | Wald statistics | Significance level |
|---|---|---|---|---|
| **Fix No.** | 1.71 | 0.26 | 43.33 | 0.00 |
| **Cash holdings** | 0.24 | 0.77 | 0.09 | 0.76 |
| **Fix No.** | 1.74 | 0.26 | 45.38 | 0.00 |
| **Changes in cash flow** | 0.16 | 0.53 | 0.09 | 0.77 |
| **Fix No.** | 2.23 | 1.71 | 1.71 | 0.19 |
| **Cash flow volatility** | -0.05 | 0.16 | 0.09 | 0.77 |

**Table 5.** The test results of fit goodness of the regression model (legal distortions)

| Index | Cash holdings | Changes in cash flow | Cash flow volatility |
|---|---|---|---|
| **Cox-Snell determination coefficient** | 0.2 | 0.1 | **0.1** |

| | | | |
|---|---|---|---|
| **Negel Kirk determination coefficient** | 0.4 | 0.2 | **0.1** |
| **Existence correct predictions percentage** | 100 | 100 | **100** |
| **Non-existence correct predictions percentage** | 0 | 0 | **0** |
| **Overall correct predictions percentage of the model** | 85 | 85 | **85** |
| **Omnibus Test** | 0.244<br>(0.621) | 0.159<br>(0.69) | **0.088**<br>**(0.767)** |
| **Hosmer-Lemeshow Test** | 8.466<br>(0.389) | 10.288<br>(0.245) | **7.372**<br>**(0.497)** |
| **Hypothesis result** | $H_0$ Acceptance | $H_0$ Acceptance | **$H_0$ Acceptance** |

- **There is a significant relationship between the fraud in financial reporting (financial distortions) and cash holdings in the corporates.**

As can be seen in Table (7) the significance level of Omnibus test for the first hypothesis (3-1) has been equal to 0.044 (greater than 5%). According to the achieved results it can be expressed that there is a significant relationship between the independent variable of cash holdings and the dependent variable of the fraud in financial reporting (financial distortions). This variable can have a good fit of the model. Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is rejected and $H_1$ hypothesis is accepted. The review on the regression coefficients of the cash holdings variable (-11.03) shows that at 5% error level, cash holdings variable has a negative and significant impact on the fraud in financial reporting (financial distortions) (Table 6). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained, respectively, 3.4 and 4.6 percent. These results suggest that at least 3.4 percent and at most 4.6 percent of total changes in the fraud in financial reporting (financial distortions) of companies are explained by the cash holdings variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no financial distortions is 15.6 percent and regard to the companies with financial distortions the model sensitivity is 90.5 percent. In general, 71.7 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (financial distortions) and changes cash flow in the corporates.**

As can be seen in Table (7) the significance level of Omnibus test for the second hypothesis (1-2) has been equal to 0.154 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of changes cash flow and the dependent variable of the fraud in financial reporting (financial distortions). Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the changes cash flow variable (-3.56) shows that at 5% error level, changes cash flow variable has no significant impact on the fraud in financial reporting (financial distortions) (Table 6). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained, respectively, 1.7 and 2.3 percent. These results suggest that at least 1.7 percent and at most 2.3 percent of total changes in the fraud in financial reporting (financial distortions) of companies are explained by the changes cash flow variable in the logistic regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no financial distortions is 2.2 percent and regard to the companies with financial distortions the model sensitivity is 100 percent. In general, 63.3 percent of companies are exactly classified at the fitted model.

- **There is a significant relationship between the fraud in financial reporting (financial distortions) and cash flow volatility in the corporates.**

As can be seen in Table (7) the significance level of Omnibus test for the third hypothesis (3-3) has been equal to 0.681 (greater than 5%). According to the achieved results it can be expressed that there is no significant relationship between the independent variable of cash flow volatility and the dependent variable of the fraud in financial reporting (financial distortions). Therefore, at the confidence level of higher than 95% the $H_0$ hypothesis is accepted and $H_1$ hypothesis is rejected. The review on the regression coefficients of the cash flow volatility variable (0.02) shows that at 5% error level, cash flow volatility variable has no significant impact on the fraud in financial reporting (financial distortions) (Table 6). On the other hand, the values of the determination coefficients of Cox-Snell and Negel Kirk of fitted model are obtained respectively, 0.1 and 0.2 percent. These results suggest that at least 0.1 percent and at most 0.2 percent of total changes in the fraud in financial reporting (financial distortions) of companies are explained by the cash flow volatility variable in the logistic

regression. In addition, the survey of classification results suggest that the model sensitivity in determining the companies that have no financial distortions is 0 percent and regard to the companies with financial distortions the model sensitivity is 100 percent. In general, 62.5 percent of companies are exactly classified at the fitted model.

**Table 6.** The results of the logistic regression model fitting (financial distortions)

| Variables | Regression coefficient | Standard Error | Wald statistics | Significance level |
|---|---|---|---|---|
| **Fix No.** | 1.02 | 0.33 | 9.61 | 0.00 |
| **Cash holdings** | -11.03 | 5.55 | 3.95 | 0.04 |
| **Fix No.** | 0.56 | 0.21 | 6.75 | 0.01 |
| **Changes in cash flow** | -3.56 | 15.15 | 0.06 | 0.81 |
| **Fix No.** | -1.14 | 1.34 | 0.73 | 0.39 |
| **Cash flow volatility** | 0.02 | 0.12 | 0.04 | 0.85 |

**Table 7.** The test results of fit goodness of the regression model (financial distortions)

| Index | Cash holdings | Changes in cash flow | Cash flow volatility |
|---|---|---|---|
| **Cox-Snell determination coefficient** | 3.4 | 1.7 | 0.1 |
| **Negel Kirk determination coefficient** | 4.6 | 2.3 | 0.2 |
| **Existence correct predictions percentage** | 90.5 | 100 | 100 |
| **Non-existence correct predictions percentage** | 15.6 | 2.2 | 0 |
| **Overall correct predictions percentage of the model** | 71.7 | 63.3 | 62.5 |
| **Omnibus Test** | 4.074 (0.044) | 2.029 (0.154) | 0.169 (0.681) |
| **Hosmer-Lemeshow Test** | 6.139 (0.632) | 4.117 (0.154) | 12.139 (0.143) |
| **Hypothesis result** | $H_0$ Acceptance | $H_0$ Acceptance | $H_0$ Acceptance |

## CONCLUSION

This study examines the relationship between fraud and cash policies of listed companies in Tehran Stock Exchange. Assumptions about the significant relationship between fraud (financial and tax distortions) in financial reporting

and cash holdings have been confirmed by logistic regression test. However, the hypotheses of significant relationship between fraud (legal distortions) in financial reporting and cash holding, as well as the significant relationship between the fraud (financial, legal and tax distortions) in financial reporting and changes in cash flow and cash flow volatility have been rejected. This means that, on the basis of empirical evidence and the findings, in a general conclusion it can be stated that there is no significant difference between the presence and absence of fraud in financial reporting and changes in cash flow and cash flow volatility. Therefore, to evaluate the fraud, criteria and factors other than changes in cash flow and cash flow volatility must be examined.

## RECOMMENDATIONS

### Practical recommendations

According to the research hypotheses, the following recommendations can be made in this connection:

• Corporates' financial policy makers should consider the company's financial policy and move their policies towards less changes in cash holdings in order to prevent fraud. Therefore, in the time of unexpected problems, they can demonstrate appropriate reaction.

• It is recommended that investors influence cash fiscal policy in their decisions in order to have better returns and lower risk.

• Officials and planners of the corporates should consider fraud (financial and tax distortions) as a factor that significantly influences the cash holding by the companies and is able to demonstrate the demand of companies for cash holdings.

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