



Evaluate the consequences of profit distortion on stock returns using models based on accounting variables

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ABSTRACT

Analyzing the market situation and examining the trend of changes in its indicators is one of the important issues in the field of investment and one of the important topics in financial science studies. The present study aims to evaluate the consequences of profit distortion on stock returns, the information of the financial statements of 98 companies listed on the Tehran Stock Exchange between 1394 and 1399. This research is a descriptive research in correlation with the applied approach in order to compile theoretical foundations and backgrounds from valid scientific sources and to collect data from financial statements and attachments contained in the Codal site and information provided on the stock exchange Tehran securities site have been used. Findings show that there is a positive significant relationship between the probability of fraud according to the F and the M of companies and stock returns. There is also a significant difference between the returns of companies with the possibility of fraud according to F and M with other companies. This means that companies where there is a risk of fraud have lower returns than market returns.

Keywords: F-SCORE, M-Score, Profit Distortion, stock returns

1. Introduction

The reaction of the stock market to different factors is different. Market behavior is generally a function of changes in economic factors, political conditions, policies and government interventions, potential crises, and the status of companies operating in it. Although environmental factors, especially macroeconomic factors, can have a significant impact on market conditions, But the role of corporate characteristics such as profitability, capital structure and corporate governance components such as the application of internal controls can not be ignored. Also, announcing good and bad news due to any change in the mentioned components can have a different effect on market behavior. The market reaction is shown as a change in the indices and their returns or by a change in the price and stock returns of companies. If the role of any of the influencing factors is important, the market reaction may also be large and long-term. If these factors do not have a serious impact on the market, market changes will not show a serious reflection of the influencing factors. The profitability of companies can probably create a good reaction in the market. Nowruzi et al. (2016) believe that the main value of profit depends on the disclosure of information that is not disclosed by other sources and its information content and value depends on the time of disclosure, delay and haste in disclosing good and bad news. (Vali Nia et al., 1401)

Profit distortion as one of the most challenging topics in accounting theories has always been studied by researchers and analysts in the fields of finance and investment. and it is done by company managers with specific goals and can affect the behavior of investors and market stakeholders. On the other hand, the activity of companies and the return on investment in their stocks are faced with various risks that the assessment of the amount of risks and their impact on the return of investors has always been considered (Peter and Thomas, 2013).

Profit distortion is the use of accounting techniques to provide a predominantly positive view of financial statements. This phenomenon occurs in a company when managers use judgment in financial reporting and arrange transactions in such a way that the financial statements mislead some stakeholders or the financial reporting figures are affected. In other words, profit distortion has been defined by managers as regulating transactions and reporting to deliberately

mislead shareholders (Wadi'i et al., 2012). Managers' reasons for distorting profits go back to the existence of actual and potential investors (Susanto et al. 2019). The importance of examining the issue of profit distortion in areas such as efficient appraisal - as an important part of the company's rational behavior to survive in a challenging competitive environment in the long run - The areas of financial accounting, financial risk and financial modeling are increasingly To increase. (Durana et al., 2020). In general, the reasons or factors affecting the distortion of profits in developing countries are rarely examined by up-to-date mathematical methods and still adhere to traditional approaches (Hadakova et al., 2018).

The results of studies on the usefulness of financial ratios in detecting fraud vary; Some previous studies have shown that the use of financial ratios is effective in detecting distortions (Bai et al., 2008; Subramaniam & Wild, 2009; Daniel et al., 2014), while Kaminski et al. (2004) believe in limitations. Are financial ratios. Different models, such as the M-Benish model and the F-Decho model, use different financial ratios to detect fraud. The application of these models is mostly in detecting profit manipulation, but their ability to detect fraud in financial statements is also confirmed by previous studies. (Omar et al., 2014; Wei et al., 2013; Aqaleh et al., 2016). Both models were initially estimated using US data and different financial ratios. Although the usefulness of these models in detecting financial statement fraud has been highlighted separately in previous studies, the ability of the models to determine which model offers better results is still controversial. Especially in Iran, previous studies based on the use or optimization of the Banish model have been concentrated (Kurdistani and Tatli, 2014; Shari Anaghiz et al., 2017; Nikbakht et al., 2017; Naderipour et al., 2016; Haji Heidari and Rahimian, 1398; Peyvandi, 1393; Samieinejad and Poor Heidari, 1394; Hejazi and Mokhtari Nejad, 1396) and the present study for the first time Tavana Decho model (2011) in the ability to detect distortions of financial statements.

Based on this and considering the importance of these concepts, the present study was conducted to investigate the stock market response to earnings management. In this way, first the theoretical foundations and research background will be presented and then the research hypotheses, research method, findings and discussion will be discussed.

2. Theoretical Framework and Literature Review

From the perspective of the capital market, the expectation of companies' profitability can have different effects on investors' predictions about the company's future profit and return, commensurate with the level of their expectations (Nowruzzi et al., 1400). The stock market is highly sensitive to information and the degree of sensitivity varies based on the levels of market efficiency. Today, financial and non-financial information of companies, from retrospective and futuristic aspects, as well as based on mandatory or voluntary disclosure, is presented in a different way in the market and is provided to market stakeholders. Market-based information efficiency also allows stakeholder decisions to be influenced by the latest information available in the market. Among the most important factors that can be discussed in this field are the concepts of profit management, corporate risk and weak internal control (Vali Nia et al., 1401).

Theoretical framework

Although the phenomenon of earnings management has been defined in numerous ways, however, the most acceptable definition of earnings management is known from the seminal works (for instance, Healy and Wahlen, 1999; Schipper, 1989), where earnings management is defined as a practice under which managers use judgment in financial reporting to obtain some private gains. Managers manipulate earnings to meet an analyst's earnings forecasts which in turn is expected to positively affect the stock returns (Kasznik and McNichols, 2002). Stock returns are the returns that investors generate out of the buying and selling activities in the stock market, which is affected by every piece of information, such as earnings management activities of firms.

The relationship between accounting earnings and stock return was first examined by Ball and Brown (1968), where firms manipulate earnings to enjoy higher market valuation. To date, many studies have examined the issue; however, the findings are mixed and inconclusive. One stream of research finds the positive impact of earnings management on stock return (for example, Sayari et al., 2013; Fazeli and Rasouli, 2011), whereas another study documents the negative association between (Nuryaman, 2013). Cruz

and Aeson (2015) find no effect of earnings management on stock returns. There are mainly three theoretical foundations behind mixed results, namely efficient market hypotheses (EMH), signaling theory and income smoothing theory.

EMH assert that markets are efficient because stock prices fully reflect the information (Copeland et al., 2005). Hence, no investor is expected to earn excess returns by making use of any trading strategy. Signaling theory claims that managers, being the insiders, have more information than shareholders, which in turn gives rise to information asymmetry. This asymmetry provides managers an opportunity to manipulate earnings. Managers engage in earnings manipulation to attain a favorable market reaction in the form of higher share prices, which in turn positively influences stock market return. Income smoothing is a special form of earnings management under which managers manipulate earnings to make it look less variable over time, which leads to higher market valuation (Goel and Thakor, 2003).

Stock returns

In the economy of any country, the stock market plays an essential role in assessing the economic conditions of that country. The main and most important feature of the stock market is its efficiency (Samadi et al., 2007). An efficient market is a market in which the available information immediately affects the price. Today, investors' attention to the profit figure has increased. Predicted profits are widely reported. If the company's profit falls below expectations, this reduction could lower the company's stock price. Also, achieving higher profits than the forecasted figure is good news that has a significant impact on the company's stock returns (Rahnama Rudposhti and Salehi, 2010). The growth and development of companies contributes to their profitability. The development of companies requires the development of investment. Investment development, on the one hand, will attract capital and, on the other hand, will lead it to companies that have higher returns and lower risk. Therefore, companies must create an optimal combination of risk and return in their company to attract capital. One of the most important factors in determining the risk and return of companies by investors is the volatility of stock returns. Investors define stock return volatility as a tool to measure the extent of stock market vulnerability to the existence of

an asymmetric relationship between stock returns and stock return fluctuations (Faizullah et al., 1400).

Fraud in financial reporting

Fraud is a criminal and deceptive activity with the intention of financial gain and other benefits. Also, fraud as a criminal act involves deception, cunning and unfair behavior by a deceitful and fraudulent person (Javiero et al., 2018). Existence of fraud shows that all frauds are with the intention of deceiving others and in order to achieve personal gain, and for this reason it is different from the mistake (Rahmani et al., 1396). The manner in which an item reported in the financial statements is classified, presented or disclosed is in accordance with the disclosure requirements of Accounting Standards 4. According to paragraph 4 of this Standard, fraud is any intentional or fraudulent act by one or more directors or third parties to obtain an advantage. Illegal or illegal) Auditing Standards Development Committee, 2009 (Ardakani et al., 1399).

Profit distortion in an international environment is defined as a strategic way to exercise managerial decision-making power to influence profits reported to foreign decision-makers or as a deliberate interference in the external financial reporting process for personal gain (Starkova), 2020).

Despite ACFE reports, most frauds are not detected in time because they are generally hidden from the public or even auditors. Therefore, an efficient tool is needed to detect fraud signals. To date, several tools have been provided to assist regulators as well as auditors in analyzing financial statements and assessing the likelihood of fraud. Models consisting of financial ratios are the most common models developed to detect fraud. According to previous research, these ratios are widely used and it is suggested that they be a useful tool in predicting business failure, fraud detection and performance appraisal (Green and Calderon, 1995; Green and Choi, 1997; Guan and Et al., 2008; Pearsons, 2011; Dani et al., 2013; Umayya and Aragbeh, 2014; Daniel et al., 2014; Kanapiken and Grundin, 2015).

Predicting Stock Returns Based on the Signs of Earnings Manipulation

Investors' ability to identify earnings manipulation is fundamental in financial reporting research. There

exist two contrasting views on whether investors can differentiate earnings that are arbitrarily managed from earnings that truly reflect the economic conditions of a firm. Beaver and McNichols (1998) find that, in the property and casualty insurance industry, investors can at least partially identify manipulation of loss reserves and adjust firm values accordingly. Similar results emerge from the banking industry. A number of studies conclude that investors suspect that firms with abnormally low loan loss provisions are managing earnings upward and that they discount the firm values for that reason (Wahlen 1994; Petroni et al. 2000). These findings suggest that investors indeed view abnormal accruals as more likely to reflect earnings management.

On the other hand, extensive evidence exists that investors fail to process all the available information, and so earnings management prevents efficient resource allocation. Dechow et al. (1996) find that firms earn negative and significant abnormal returns (i.e., the average of -9%) upon the first announcement of potential earnings management. This implies that investors do not fully see through earnings management reflected in abnormal accruals and consider high earnings driven by high accruals attractive. In relation to this, Sloan (1994) provides pioneering documentation of the "accruals anomaly" and shows that stock prices do not reflect earnings management. He claims that investors "fixate" on earnings, failing to reflect the information contained in the accruals and cash flows. Richardson et al. (2005) corroborate Sloan (1996)'s evidence by showing that investors are not aware that accruals lead to lower persistence of earnings and thus they misprice stocks.

Another study reports that managers inflate reported earnings prior to public equity offers (i.e., IPO), and investors are deceived by the high abnormal accruals, resulting in subsequent negative stock returns (Teoh, Welch and Wong 1998b). In particular, the study shows that public equity issuers in the most "aggressive" quartile of earnings management have a three-year market-adjusted stock return of approximately 20% less than those in the most "conservative" quartile. Recently, Hirshleifer et al. (2012) confirm again that firms with low accruals outperform firms with high accruals and further show that the excess return is due to

mispricing, not risk factors. All of these papers provide evidence for the predictive power of accruals for stock returns and against the traditional efficient market's view. Lastly, the paper by Beneish et al. (2012)-most similar to this paper-report that the firms that are lagged by the Beneish M-Score as potential misstating firms generate negative annual size-adjusted returns in every decile sorted by size, book-to-market, momentum, accruals, and short interest. They also show that the excess return on a long-short portfolio with a long position in the firms with the lowest M-Score (i.e., the lowest probability of earnings manipulation) and a short position in the firms with the highest M-Score (i.e., the highest probability of earnings manipulation) survive the usual risk controls. In summary, although investors may adjust for earnings management in certain industries such as banking or insurance where changes in accruals are more closely monitored, investors fail to detect managed earnings in general. Motivated by this idea, I attempt to find out whether the likelihood of earnings management can be used as a stock-trading strategy. The primary motivation for this research is to identify mispriced securities based on the M-Score and the F-Score.(Sozino,2013)

Internal research

Valinia et al. (1401) examined the effect of weak internal controls on changes in stock returns, real profit management and corporate risk. Findings show that the weakness of the internal control structure has a significant effect on changes in stock returns of the studied companies. Also, companies with weak internal control structure manipulate more real activities (real profit management) and have more financial risk.

Faizollahi et al. (1400) investigated the effect of accruals quality on stock fluctuations. In this regard, heterogeneous dynamic panel conditional variance heterogeneous models have been used to estimate and test the hypothesis. The results showed that the quality of accruals has a negative and significant effect on stock return risk. This means that with increasing the quality of accruals, the volatility of stock returns increases

Nikbakht et al. (1398) with the development of Banish model and with emphasis on variables outside

of accounting data, including information asymmetry and product market competition, the model was examined to identify financial statement distortions. The results indicate the randomness of the model and the inability to distinguish between the two groups of companies manipulating profits and non-manipulating profits. Also, the results show an increase in the strength of the developed Banish model compared to the original model; But the test result is poor and shows that the developed model of Benish is more or less a random model in separating the two groups of companies manipulating profit and non-manipulating profit.

In Iran, Amiri et al. (1393) in a study entitled The effect of earnings quality on changes in unconventional stock return. They studied the effect of earnings quality on changes in unconventional stock returns in Tehran Stock Exchange companies over a ten-year period from 1380 to 1390. The results showed that earnings quality has an inverse effect on changes in stock returns. The research results also indicate the direct effect of the variables of annual stock returns and operating cash flow of the next year and the inverse effect of company size on changes in stock returns.

Foreign research

Durana et al. (2020) in a study identified profit distortion in developing countries using time series analysis in Slovakia and Bulgaria. The research findings, based on a quantitative analysis of the single root, confirm the existence of significant profit distortion in both countries. In addition, the results of the homogeneity analysis highlight 2014 as an important turning point in both countries.

DeVault et al. (2019) uncover that in contrast to theoretical models that institutional investors are free from irrational trading, they, rather than individual investors, are more likely to be sentiment traders driving the sentiment-induced mispricing, due to common institutional investment styles such as risk management, reputational concerns, momentum trading, and herding.

Ni and Zhou (2016) in a study examined the effect of the quality of accruals on the risk of falling stock prices in emerging markets. The results showed that the quality of accruals, ownership structure, lack of accounting and board transparency affect stock price falls and improving the quality of accruals reduces the

risk of stock price falls. On the other hand, when companies have less information asymmetry, the relationship is weaker

Sean et al. (2015) tested the role of other information in analysts' forecasts to explain stock return fluctuations. They argued that the other information contained information beyond what was stated in the financial statements and reflected fundamental issues about the company. In their study, they found that there was a direct link between stock price fluctuations and uncertainty and other undesirable information.

3. Research Hypotheses

Hypothesis 1: There is a significant relationship between the probability of fraud (according to the F-SCOR) of the company and stock returns.

Hypothesis 2: There is a significant relationship between the probability of fraud (according to the M-SCOR) of the company and stock returns.

Hypothesis 3: There is a significant difference between the returns of companies with the possibility of fraud (according to the F-SCOR) and other companies.

Hypothesis 4: There is a significant difference between the returns of companies with the possibility of fraud (according to the M-SCOR) and other companies.

4. Research Methodology

The present study is an applied, descriptive and quasi-experimental research in the field of evidence accounting research that is based on real information of financial statements. Sample companies are divided into companies with the possibility of manipulation and without the possibility of manipulation based on the of Banish model (1999) and Decho et al. (2011). Then, the accuracy and error of each model is measured according to the comparison with the reference sample of fraudulent and non-fraudulent companies. In the first stage to test the probability of fraud and stock returns, if the sample companies

according to the F-SCOR and M-SCOR have reached the threshold of the probability of fraud, the relevant variable will be equal to one and otherwise equal to zero and the relationship The relationship between efficiency and the probability of fraud during the regression test is examined.

In the second stage, by examining the severity of the difference between the returns in companies with the possibility of fraud and other companies, the amount of returns in companies with the possibility of fraud is compared with other companies.

Based on theoretical foundations and research questions; In order to test the research hypotheses, the following regression model has been developed:

$$R_{i,t} = \beta_0 + \beta_1 F - SCORE_{i,t} + \beta_2 M - SCORE_{i,t} + \beta_3 LEVE_{i,t} + \beta_4 PROF_{i,t} + \beta_5 BSIZE_{i,t} + \beta_6 BCO_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 CFO_{i,t} + \epsilon_{i,t}$$

In this model:

R_{i, t}: Return on Company i in period t (dependent variable),

F – SCORE_{i,t} : Probability of Company i fraud in period t according to Decho model (independent variable),

M – SCORE_{i,t} : The probability of fraud of company i in period t according to Banish model (independent variable),

LEV_{i, t}: financial leverage of company i in period t (control variable)

PROF_{i, t}: Positive changes in i's profit in period t (control variable)

BSIZE_{i, t}: size of the board of directors of company i in period t (control variable),

BCO_{i, t}: Independence of the board of directors of company i in period t (control variable),

SIZE_{i, t}: company size i in period t (control variable)

CFO_{i, t}: Company i's cash flow in period t (control variable),

β₁ to β₈: coefficients of variables,

β₀: constant coefficient,

ε_{i, t}: are regression errors.

Table: Variables used in the research and their abbreviations

type	Research variables	mark	Row
dependent variable	Stock returns	R	1
independent variable	Dechow index	F-SCORE	2
independent variable	Banish index	M-SCORE	3
Control variable	Positive profit changes	PROF	4

type	Research variables	mark	Row
Control variable	Board size	BSIZE	5
Control variable	Financial Leverage	LEVE	6
Control variable	Independence of the board of directors	BCO	7
Control variable	size of the company	SIZE	8
Control variable	Operating cash flow	CFO	9

Beneish model (1997, 1999) or M-Score:

Beneish (1999) profiles firms identified as earnings manipulators (i.e., firms that are charged with manipulation or firms that admit to manipulation in the public press) from 1982 to 1988 and develops a statistical model (i.e., the Beneish M-Score) to discriminate manipulators from non-manipulators. The Beneish M-Score does not apply to the finance industry (i.e., Division H), so I exclude the finance industry in my analysis of the M-Score throughout the paper. Also, when the two scores are compared with each other, the finance industry is eliminated from the F-Score sample for a fair comparison. The model relies exclusively on financial statement data. Specifically, the model consists of variables that seek to capture the effects of manipulation or the conditions that incentivize the managers to misstate earnings. The M-Score increases with (1) increasing receivables (DSR), (2) deteriorating gross margin (GMI), (3) increasing expenditure capitalization (AQI), (4) increasing sales (SGI), (5) declining depreciation rates (DEPI), (6) decreasing administrative and marketing efficiency (SGAI), (7) increasing leverage (LEVI), and (8) increasing accruals to total assets (TATA). The M-Score is different from other accruals-based models because only DSR, DEPI, and TATA are aligned with accrual measures. The following shows the eight variables and the loading on these variables. The detailed description of each of these eight variables can be found in Appendix 2.

$$MScore = -4.84 + 0.920 * DSR + 0.528 * GMI + 0.404 * AQI + 0.892 * SGI + 0.115 * DEPI - 0.172 * SGAI - 0.327 * LEVI + 4.679 * TATA$$

Two types of error can arise from this model. Type I classification error (i.e., the probability of missing a manipulator) needs to be traded off against Type II classification error (i.e., the probability of flagging an innocent firm). Beneish (1999) measures the relative cost of the two error types and sets a

threshold (i.e., cutoff) value of -1.78. That is, the firms with M-Scores greater than -1.78 are flagged as potential manipulators.

The Dechow F-Score

Dechow et al. (2011) construct a statistical model for earnings management by conducting a thorough analysis of the 2,190 Accounting and Auditing Enforcement Releases (AAERs) by the SEC from 1982 to 2005. They select variables based on the idea that the likelihood of earnings management increases with (1) increasing accruals, (2) decreasing performance, and (3) increasing market-related incentives. They conduct tests of pairwise difference in mean values of the variables for misstatement firm-years and non-misstatement firm-years. They then estimate logistic regressions to determine whether the variables are jointly significant in predicting misstatement firm-years and use a backward elimination technique to arrive at their prediction model. The predicted value is obtained by plugging each firm's financial data into the following model.

$$Value = -7.893 + 0.790 * RSST + 2.518 * \Delta REC + 1.191 * \Delta INV + 1.979 * SOFTASSETS + 0.171 * \Delta CASHSALES - 0.932 * \Delta ROA + 1.029 * ISSUE$$

The predicted value does not represent the probability of earnings misstatements, but it can be turned into the predicted probability using the logistic transformation. Dividing the predicted probability by the unconditional expectation of a misstatement (i.e., the number of misstatement firms divided by the total number of firms) gives the F-Score.

$$F - SCORE = \frac{e^{Value}}{1 + e^{value}} * \frac{1}{0.0037}$$

The F-Score of 1.00 indicates that the firm has the same probability of a misstatement as the unconditional expectation. The F-Score greater than

1.00 indicates a statistically higher likelihood of a misstatement.

Control variables

Positive Profit Changes (PROF)

In this study, in order to measure the company's profitability, we use the difference between this year's net profit and the previous year, so that if the company's profit increases compared to the previous year, it will be one, otherwise it will be zero (Hashempour, 1394).

Financial leverage (leverage)

This ratio shows how much of the company's assets are secured through debt and borrowing and how much is raised through capital. It is obtained from the sum of the total debts of the company divided by the total assets of the company in the desired year (Didar et al., 1397).

$$LEVE_{it} = \frac{DEBT_{it}}{ASSETS_{it}}$$

Board size (BSIZE)

Number of directors who are members of the board. Board size is one of the corporate governance mechanisms that has been studied in various studies. Most researchers have found that the size of the board improves the performance of the company in two ways: a) more need for the company to establish a relationship with the external environment of the company and b) more executive responsibility in companies (Kriogorski, 2006; Bandarian et al., 1397)

Board Independence (BCO)

The independence of the board of directors is obtained by dividing the number of non-executive members of the board of directors by all the active and non-executive members of the board of directors. Non-executive members do not have an executive position in the company (Bandarian et al., 1397)

Company size (size)

$$SIZE_{it} = LOG(ASSETS_{it})$$

Operating Cash Flow Ratio (CFO)

$$CFO_{it} = \frac{CFO_{it}}{ASSETS_{it}}$$

In order to estimate the research models, Chav or F-Limer test for the years 1395 to 1399 and based on pooling data for 5 years has been used. The results of

the estimated models to test the research hypotheses are presented below. Hypotheses were also analyzed and tested by Ives econometric software version 9 using regression of ordinary least squares (OLS) method with integrated data approach at 5% significance levels. Also, 1% above and below the numbers were considered as outliers.

Statistical community and sampling

The statistical population of this research includes companies listed on the Tehran Stock Exchange and the sampling method is a systematic elimination method that is screened according to the following conditions:

- 1) The financial information of the company for the period between 1394 to 1399 is available.
- 2) In order to increase comparability, their financial year should end in March.
- 3) Do not stop trading symbols for more than four months in each year.
- 4) Investment companies and banks will be excluded from the statistical community
- 5) Companies have been listed on the stock exchange before 1390.

Considering that in order to calculate the model of Mnbish and F Deco, the information of the last 1 and 3 years is needed, so the data used to estimate the degree of profit distortion starts from 1390, but the period under study is from 1394.

After applying the sampling conditions and reviewing the audited financial statements, 49 companies were finally screened as reference companies with the possibility of manipulation; Then, the same number of identical pair samples, ie companies of the same size and in the same fiscal year, were selected as reference companies without the possibility of manipulation (control group). Thus, the statistical sample includes a total of 98 companies.

Data Description

In general, dispersion parameters are a criterion for determining the degree of dispersion from each other or their degree of dispersion relative to the mean. One of the most important scattering parameters is the standard deviation. Among the research variables, board independence and company size have the lowest and highest dispersion, respectively. The degree of asymmetry of the frequency curve is called skewness.

If the skewness coefficient is zero, the society is perfectly symmetrical, and if this coefficient is positive, the skewness is to the right, and if the coefficient is negative, the skewness is to the left. The profitability variable has the lowest asymmetry and the operating cash flow variable has the highest asymmetry compared to the normal distribution.

Skewness	Std. Deviation	Min	Max	Median	Mean	Variable
0.30	0.13	0.21-	0.70	0.25	0.24	return
0.36	0.57	5	7	5	5.18	BSIZE
0.43-	0.12	0.20	0.60	0.40	0.46	BCO
0.32	0.66	4.57	7.82	5.99	5.97	size
0.52-	0.17	0.10	0.79	0.64	0.59	LEV
0.10	0.18	0.19-	0.79	0.09	0.15	PROF
0.69	0.14	0.27-	0.56	0.07	0.10	CFO

Regression analysis

Inferential statistics determine whether the patterns and processes discovered in the sample also apply to the statistical community. Therefore, inferential statistics are about the characteristics and parameters related to the statistical population of the research and the quality of the relationship between concepts and variables. Thus, it can be said that inferential statistics are used in comparative and relational analysis (causal-correlation). (Hafiz Nia, 1389).

Test result of the first model of research

The results of the first model of the research are described in the table below.

Figure: Test results of the first model of research at the level of composite data by OLS method

$R_{i,t} = \beta_0 + \beta_1 F - SCORE_{i,t} + \beta_2 M - SCORE_{i,t} + \beta_3 LEVE_{i,t} + \beta_4 PROF_{i,t} + \beta_5 BSIZE_{i,t} + \beta_6 BCO_{i,t} + \beta_7 SIZE_{i,t} + \beta_8 CFO_{i,t} + \epsilon_{i,t}$				
VIF	sig	T	Coefficient	index
	0.00	6.06	0.34	β_0
1.17	0.02	2.30	0.04	F - SCORE
1.00	0.03	-2.14	0.02	M-SCORE
1.16	0.01	2.48	0.03	LEVE
1.01	0.02	2.26-	0.06-	Prof
1.02	0.02	2.20-	0.02-	BSIZE
1.01	0.00	2.62-	0.02-	BCO
1.03	0.02	2.28-	0.09-	Size
1.00	0.03	2.14-	0.04-	CFO
0.45				R2
26.65)0.00(F) sig(
2.04				Durbin-Watson

As can be seen, the significance of Fisher statistic (26.65) at the level of 5% indicates the overall significance of the estimated model. Therefore, the research model is significant in general and independent and control variables have the ability to explain the dependent variable. In addition, the adjusted coefficient of determination (R2) is 0.45. This number shows that approximately 0.45% of the dependent variable changes can be attributed to independent and control variables and the other 0.54% is due to other factors that are beyond the reach of the researcher. The larger the value of this, the greater the scatter of points around the regression line. The value of Watson camera (2.05) indicates that there is no problem of first-order serial autocorrelation in the

components of the estimated model, so the results of the estimated model are not false and the model estimate is reliable (normal should be between 1.5 and 2.5). The value of the variance inflation (VIF) also indicates that the independent variables of the first model do not have a strong correlation problem with each other. There is no multiple between model independent variables.

According to the results of the T-test table related to the independent variables F-SCORE and M-SCORE, they have positive coefficients of 0.04 and 0.02, which show that there is a direct relationship between profitability and profit management, and their significance level and with Paying attention to the fact that the considered error level for this research was

0.05, so the mentioned variables have a significant effect on stock returns and the first part of the second hypothesis of the research can be confirmed in a linear relationship and at a confidence level of 95. % approved. As a result, companies in which profit manipulation has taken place have changes in profitability compared to other companies in the market.

The results of the control variables also showed that there is a significant negative relationship between the size and independence of the board of directors, company size, profitability and operating cash flow with stock returns. And a positive and significant

relationship was observed between the variable of financial leverage and stock returns. The confirmation of the mentioned control variables shows the effect of these variables on the dependent variable and they have been correctly identified and estimated in the model.

Second stage test

As can be seen in the table below, the average return in companies that have no chance of fraud is lower than the average return of companies in which there is a possibility of fraud according to the F-SCOR and M-SCORE models.

Figure: Results of comparing the average of companies with the possibility of fraud with the F-SCORE

Group Statistics					
		N	Mean	Std. Deviation	Standard error deviation
R	Missing	38	0.193	0.136	0.0050
	Valid	44	0.342	0.1329	0.0073

Figure: Results of comparing the average of companies with the possibility of fraud with the M-SCORE

Group Statistics					
		N	Mean	Std. Deviation	Standard error deviation
R	Missing	39	0.182	0.177	0.0063
	Valid	46	0.219	0.126	0.0091

Discussion and conclusion

The study and situation of the capital market, including changes in indices and stock returns of companies is one of the most important issues discussed in financial science and investment. The reaction of the capital market to the factors affecting it is reflected through changes in indices and stock trading prices and returns. Intrinsic factors, environmental factors and market characteristics can affect the return of financial assets traded in the market and companies' stocks, and each of them has a behavior of indices and changes in price and stock returns, and the market to changes in each One of these factors shows different reactions. With regard to these matters, the present study has been conducted with the aim of studying the effect of earnings distortion on stock returns. For this purpose, financial information related to 98 companies operating in the Tehran Stock Exchange during the period 1394 to 1399 and also the stock returns of these companies were collected and analyzed using GMM. The results of data analysis and testing of research hypotheses showed that there is a significant relationship between

the probability of fraud according to the F- and the M- of companies and stock returns. On this basis, it can be argued that companies that have the potential to distort profits run the risk of depreciating the market value of stocks. Weak management can lead to a negative reaction in the stock market and jeopardize the interests of stakeholders. Accordingly, it is recommended that company managers pay special attention to reforming and strengthening the internal control structure. Also, in the third and fourth hypotheses of this study, there is a significant difference between the returns of companies with the probability of fraud according to F- and M- with other companies. When companies have a high probability of profit distortion, managers will have more opportunity to manipulate real activities. Increasing the level of financial risk and consequently increasing the likelihood of financial distress increases the risk of falling stock prices in the market. Therefore, company managers and decision makers are advised to pay attention to the role of poor supervision in increasing the amount of financial risk and to reduce financial risk, improve processes and apply more appropriate

controls. Owners and stakeholders of companies are also suggested to emphasize the need to establish internal controls of companies. Company auditors evaluate and comment on the internal control structure of companies.

Suggestions for future research

- 1) Due to the fact that in the current research, no attention was paid to the economic conditions in terms of recession, inflation, or prosperity, it is suggested to conduct a similar research in the conditions of recession, inflation, and economic prosperity.
- 2) It is suggested to use other models in future researches to estimate discretionary and non-discretionary accrual items.
- 3) It is suggested that in the future researches, the issue of auditor's independence should also be considered to determine the category of profit management.
- 4) It is suggested that for future researches, the relationship between profit manipulation and stock return of the main company accepted in Tehran Stock Exchange should be done with emphasis on the type of industry.
- 5) To provide the necessary training on behalf of the Tehran Stock Exchange Organization to shareholders, investors and other interested parties in order to increase awareness of voluntary and non-discretionary accrual items of the group companies with regard to their role in determining the return on the shares of the main company and also the more favorable use of the Consolidated financial statements of group companies seem necessary.
- 6) It is suggested that the long-term performance of new shares in the Tehran Stock Exchange should be evaluated by taking into account the price adjusting factors such as profit distribution and capital increase.
- 7) Other variables affecting the annual abnormal return resulting from the initial stock price, such as the amount of sales, the amount of assets and equity, and the volume of transactions can also be studied.
- 8) It is suggested to study the relationship between short-term return and long-term return of new shares after the first offering of shares in the stock market.

One of the main limitations of this research; Lack of databases related to fraud in financial reporting as well as non-publication of cases and frauds by relevant institutions in organizations such as the Securities and Exchange Commission and the National Inspection Agency and other regulatory bodies that affect the internal validity of research. The second limitation was the lack of a specific theoretical framework in determining the criteria for determining the factors affecting fraud. Doing more research in this area can help to better explain the issue of financial reporting fraud.

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