



Applied-Research Paper

Analyzing the Efficiency of Capital Market Relative to the Decreasing and Increasing Information of the Components of Accounting Earning

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ARTICLE INFO

Article history:

Received 2019-06-04

Accepted 2019-09-30

Keywords:

capital market efficiency

accrual earnings components

cash earnings components

simultaneous equation system

Mishkin's test

ABSTRACT

This research investigates the capital market's efficiency relative to the decreasing and increasing information the components of cash and accrual of the accounting earnings. In the accrual accounting system, accounting earnings includes two components of cash and accrual. Information about decreasing and increasing values of the normal and abnormal portion of the changes in financial assets as a cash component is compared with the information on the decreasing and increasing amounts of discretionary and non-discretionary accruals. The required data was extracted from the financial statements of the listed companies in Tehran Stock Exchange during the years 2003 to 2017. In order to estimate the research models from the regression with the combined data as well as the equations system, the simultaneous equations system with the seemingly unrelated regression (SUR) approach are utilized and then some experiments are implemented to evaluate the research hypotheses by using Mishkin's test. The results reveal that the capital market is inefficient in terms of the increasing information (positive portion) of accrual and discretionary accruals and information on abnormal changes in financial assets (increasing and decreasing), but rather on the information (negative) of discretionary and non-discretionary accruals and abnormal changes in the financial assets (increasing and decreasing).

1 Introduction

One of the controversial issues in financial literature is the hypothesis of efficient markets that was provided in the 1970s. In this hypothesis, it is expressed that the investors are mostly aware and logical. They show a logical reaction to the news and information brought to the market. In this matter, the stock prices are quick, complete, and unbiased to react to new information, and at each moment of time, they represent the inherent value of them [15]. From a theoretical point of view, the total supply and demand

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generated by the investors based on their perception of return on investment determines the price of a stock in a market. It is reasonable to judge the average behavior of investors in the market. However, in practice, sometimes, the market does not work reasonably in the face of existing information, in which the consequently will be inherent in the value of the stock market. If the ratio of inherent value to the price for certain securities are very high or low, then the evaluation of those securities by the market is not done correctly and its price is more or less realistic. Therefore, the low (high) ratio of inherent value to price indicates either high or low stock pricing [16].

The aim of this research is to investigate the capital market's efficiency in terms of the decreasing and increasing information of the components of cash and accrual earnings. To achieve this aim, the cash segment of the earnings (Δ CASH) includes change in cash(CASH), distributed cash among the shareholders(DIST_EQ) and distributed cash between creditors (DIST_D) and Δ CASH to components of normal and abnormal changes, and finally, the positive and negative amounts of each section of the normal and abnormal changes in cash flow are considered as decreasing information and increasing cash components of earnings. The accrual section is also allocated to discretionary and non-discretionary accruals. The positive and negative values of discretionary and non-discretionary accruals are also provided as accrual section information. Finally, market efficiency is investigated for each of these decreasing amounts and increasing processes. In the conceptual model, the components of earnings are expressed.

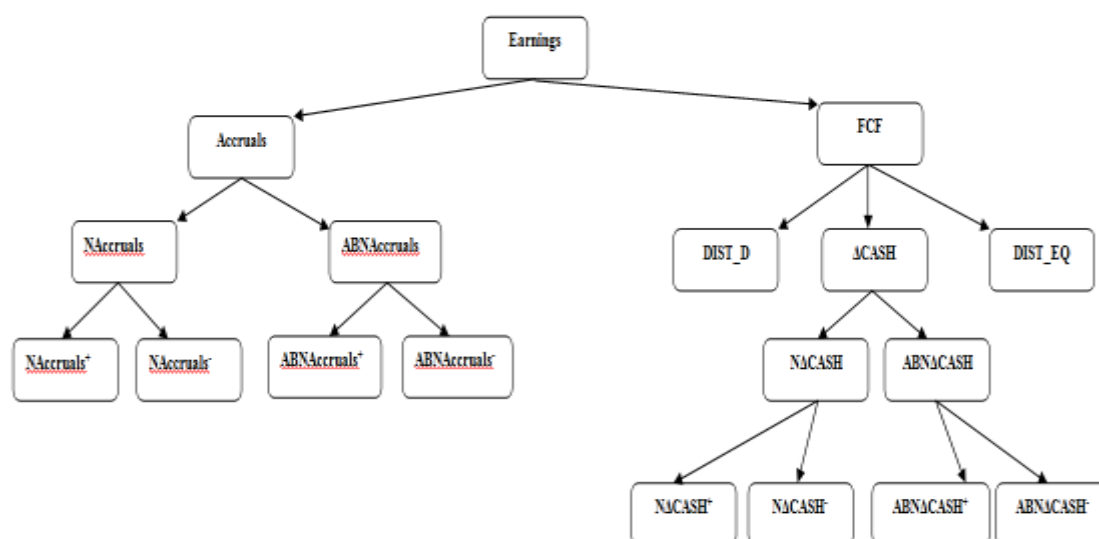


Fig. 1. The components of earnings

The reason for the efficiency of the stock exchange is that the higher the efficiency of the stock exchange, the greater the investor's confidence in the stock exchange, the greater their willingness to invest. With regard to the role that information, informing, and financial experts can play, it is attempting to smooth the path to the efficiency of the Iranian securities market by conducting research. In previous researches, researchers have also looked at market efficiency, but this research seeks to evaluate the capital market efficiency in Iran under increasing and decreasing amounts of cash components and accrual accounting earnings. This is because the accounting earnings and their components are the most important products of the accounting system, which are used by investors for stock pricing. Many researchers in most of the previous researches such as ([25, 18, 13, 27]; Nurunnabi [26, 19, 29, 5]) inves-

tingated the market efficiency is only a proportion to the historical or current information (and not specific sets of information, such as accounting earnings information), and these studies do not state what market is efficient which information and which information does not efficient, but in practice, it is possible that the market has some effective information. As a result, this research seeks to investigate the capital market's efficiency in terms of the decreasing and increasing information under the components of cash and accrual of accounting earnings. Note that it is expected that the results of this study will have the contribution as follows:

Firstly, the results of this research can help develop the literature related to capital market efficiency (especially in the capital market of Iran). Secondly, determining the capital market, in the analysis of information, which part of the components (decreasing and expanding) of cash and accruals of earnings (in the direction of stock valuation) operates efficiently and which components are inefficient. Thereby, providing useful information to investors, creditors, managers and, standard setters to achieve their objectives so that they can provide a platform to generate an efficient market to ensure greater investment. Third, the results of this research can highlight some new ideas and suggestions for further research on the topic of research. The remainder of this paper is organized as follows: In the second section, theoretical foundations and research background are presented. In the third section, research hypotheses are presented. Then the methodology is presented in the fourth section of the research. In the fifth section, the analysis of the findings of the research and at the end of the discussion and conclusions of the research are discussed in the sixth section.

2 Background and Literature Review

The capital market is one of the important tools of the capitalist economic system. In the system, the ideal market is a market in which the prices are the right signals for capital allocation. In other words, in the efficient market, when companies provide securities for financing, they can expect "fair" prices for their securities. On the other hand, when investors invest in securities for investment, they can expect fair payments in this way. If the objective of the capital market is to allocate the correct and optimal financial resources, the price of the securities should be an appropriate index of the (real) value of the securities. The capital market is a market that operates in the processing of information. In this market, the price of the securities at any given moment of time is based on the "correct" assessment of all available information at that time. In other words, in the anicient market, the prices fully reflect the available information [1]. Inefficient markets bring some problems and challenges for financing and cash distribution [11]. In a securities market where investors make a logical decision, and there is complete and symmetric information on exchanged assets, information is quickly and fully reflected in stock prices. In other words, in an efficient market, it is assumed that all available information, immediately or after a short time, without any personal comments on stock prices, is reflected [32]. Whatever the capital market is more efficient, and investors could better predict the real values, more funds will be attracted to these markets.

Due to the high volume of information published on a business entity, the shareholders cannot investigate all available information. Including this information, accounting earning is one of the most important issues used by investors in stock pricing analysis. Nevertheless, the use of accounting earnings information, without any precision in the form of the creation and composition of its components, may lead to unfavorable results in the further [2]. When investors invest in stock exchanges using profitability information (and so on) and thereby make abnormal returns, it is said that stock pricing (using its accounting earnings and its components) is irrational and capital market is not effective in reflecting

information of accounting earnings and it's in stock pricing. Alizadeh and Aflatoni [3] implemented a study in which the efficiency of the capital market was analyzed in the reflection of historical data sets related to accounting earnings, operating cash flows and accruals in stock prices. The results showed that the capital market is not necessary to reflect the information on accounting earnings, operating cash flows and accruals (as general items). This issue emphasizes the role of the stock exchange organization in generating the necessary context for fully reflective and timely information on the stock prices of companies. This inefficiency can be generated due to a high amount of information and a lack of investor attention to the components of earnings. Besides, investors' ignorance and the lack of understanding of information by them is a reason for inefficiencies in the capital market. In an accrual accounting system, earnings contain two components: cash and accrual. Free cash flows include three components of change in net cash, net distributed cash to shareholders, and net distributed cash to creditors [9]. Besides, the net changes in cash are split into two normal and abnormal components, whether positive or negative [7]. Accruals are generated from the use of an accounting accrual basis, and in the definition of it, it can be said to refer to a portion of the accounting earnings, for which no cash has been entered into the business entity. Accruals are divided into discretionary and non-discretionary accruals; discretionary accruals refer to part of the accruals that the manager has the ability to manipulate, while the non-discretionary accruals that are specific to the business entity's specific characteristics, while the manager cannot able to manipulate it [8].

In general, non-discretionary accruals are subject to accounting standards that are required and influenced by the company's economic conditions, which are limited by the rules of the organizations and other external factors. Thus, these items are relatively safe from being manipulated using the management. However, the discretionary accruals are applicable by management. The non-discretionary accruals represent the part of the accruals that are created in the normal process of an institution's activity, and it is anticipated that management will not interfere in its creation. In the discretionary accruals, there is a possibility that management motivations will make a significant volatile commitment, and reduce its reliability. Nevertheless, in terms of cash, this fluctuation is far lower. [31]. The evidence indicate that the components of accruals are relevant in capital market. If this information is distributed asymmetrically, investors are mispricing these items. Different research into pricing of earnings components in market often focuses on earnings features, such as the different sustainability of earnings components [17], and [28]. These studies have shown that investors have been able to distinguish in different levels of sustainability, between cash components and accruals that lead to significant mispricing of components of earnings [33]. Moreover, several results showed that the capital market has the ability to understand the importance of the components of earnings. For instance, Hand [14] Sloan [28], Teoh and Wong [30] and Desai et al. [10] have shown that investors are less likely to lose weight on the sustainability of cash components and give greater weight to the sustainability of current payoff components, thus, shareholders to earnings accrual section is less weighty and it underpricing. xie [34] find that the abnormal accruals have less sustainable than the normal accruals, and as a result, the market is overpricing abnormal accruals than normal accruals, while the abnormal accruals are less sustainable than abnormal positive changes in cash outflows. As a result, the abnormal accruals are overpricing than the abnormal positive changes in cash. Sloan [28] show that the earnings accrual component is less stable with respect to the cash component of the earnings, while the reason for this is the subjectivity of accruals items relative to the cash components. He argued that although the sustainability of an accruals element is less than cash, the investors are unable to fully appreciate this difference, which is reflected in the stock price. In the following, Chen and Shane [7] state that components of less sustain-

able earnings are mistakenly overpriced by stockholders. The different reaction of investors to the different sustainability of earnings components, in their stock pricing and behavioural unbiased, can lead to a separation of market prices from their inherent value and market inefficiencies. Mithu and Lim [23] argue that the normal positive changes in cash are more stable over unusual positive changes in cash, so the market is expected to overpriced abnormal positive changes than normal positive changes. The results of Mousavi Shiri et al. [24] show that the earnings operating component than the non-operating component, the cash component than the accrual component, accrual component of the operating income versus the accruals component of non-operating income and the cash component of the operating income over the cash component of the non-operating income is more sustainability. In addition, the results of Hui et al [17] and Foroughi et al. [12] show that investors do not understand the different sustainability of earnings components. For this reason, in its forecasts, it does not consider factors affecting the correct prediction of future returns, including the earnings components of company's specific, or it is wrong to estimate that their incorrect response to follows, which could be due to lack of training and poor market efficiency and lack of transparency in the capital market. Wu et al. [22] also indicate that investors' attitudes are not the cause of the anomalies of the sustainability of earnings components, and the difference in the disclosure quality of earnings components is a factor in the abnormality in the sustainability of earnings components.

Chen and Shane [7] argue that in comparison with the positive normal change in cash that leads the company to an optimum level of cash holding, positive abnormal change in cash leads to the amount of cash surplus, which may result in less sustainability than abnormal negative changes. This leads to the loss of opportunities for investing in projects with a positive net present value. Regarding that investors generally expect positive changes in cash and do not expect abnormal positive changes in cash, investors are not predicting abnormal positive changes in cash. Hence, when these abnormal positive cash changes occur in reality, investors react emotionally and these abnormal positive changes to overpriced than normal cash changes. It would seem that the changes that led to the increase and decrease of accruals and cash would be different sustainability, which would lead to a different reaction from the market participants to the sustainability of this information. This reaction could lead to market failure. Mishkin [22] describe that if the market does not work efficiently for information specific to a specific set of information, it can obtain more return than average return of the market using the same component information. Thus, in order to investigate the capital market's efficiency, it reflects a specific set of information in stock prices on a new method based on the estimate of the simultaneous equation system. It can be seen whether the capital market has been able to reflect a particular set of information at stock prices. Therefore, certain information that has been analyzed in this study includes increasing and decreasing components of earnings cash and accruals, and based on this, the research hypotheses is developed as follows.

Hypothesis 1: The capital market in information analysis of the normal positive values of the changes in financial assets acts efficiently.

Hypothesis 2: The capital market in information analysis of the normal negative values of the changes in financial assets acts efficiently.

Hypothesis 3: The capital market in information analysis of the abnormal positive values of the changes in financial assets acts efficiently.

Hypothesis 4: The capital market in information analysis of the abnormal negative values of the changes in financial assets acts efficiently.

Hypothesis 5: The capital market in the analysis of information of the positive discretionary accruals acts efficiently.

Hypothesis 6: The capital market in the analysis of information of the negative discretionary accruals acts efficiently.

Hypothesis 7: The capital market in the analysis of information of the positive non-discretionary accruals acts efficiently.

Hypothesis 8: The capital market in the analysis of information of the negative non-discretionary accruals acts efficiently.

3 Research Method

This research is an application in terms of its aim and is a quasi-experimental research. The required data, which is the result of various processes in the companies and exchange processes, is available in the securities market, from a database of Rahavard Novin Bank and the company's financial statements were extracted and then the research hypotheses were tested using the existing data. This research is ex-post facto based of time. The data used in the research are a combination of cross-sectional type. In order to research models from regression with panel data approach and estimate the systems of equations, the system of simultaneous equation loading of seemingly unrelated regression and the test research hypotheses are used in the Mishkin test [30].

3.1 Statistical Population and Sample

The statistical population of this research is all companies listed in Tehran Stock Exchange from 2003 until the end of 2017. The statistical sample by systematic elimination method have been selected to following conditions:

- 1- First, those companies that did not finish their fiscal year in March are excluded.
- 2- Then, banks and financial institutions and financial investment companies (due to the different nature of their activities from other business units) are removed.
- 3- Those companies with a negative book value of their equity are eliminated.
- 4- Finally, all companies whose data were not available to calculate the research variables are removed.

By applying the above conditions, 137 companies (2055 years-company) are chosen to estimate the models and to evaluate the research hypotheses.

3.2 Models and research variables

3.2.1 The decomposition of earnings to cash and accrual components

In this section, using the approach of Dechow, Richardson and Sloan [28], as well as Anderson et al. [4], net profit is decomposed into free cash flow and accruals. For this purpose, the following equation is utilized:

$$Earnings_{it} = ACC_{it} + FCF_{it} \quad (1)$$

Where Earnings: operating profit, FCF: free cash flow and is equal to cash flows operating and investment activities, and ACC: accruals are equivalent to operating profit minus cash flow. To mitigate heteroskedasticity the above items are deflated by lagged assets.

3.2.2 Decomposing free cash flow to its components

In this section, using the Dechow et al. [9] approach, free cash flow to its components is decomposed.

For this purpose, the following is used:

$$FCF_{it} = \Delta CASH_{it} + DIST_D_{it} + DIST_EQ_{it} \quad (2)$$

In which, $\Delta CASH$: change in financial assets (cash and short-term investments), $DIST_D$: cash distributed to creditors and $DIST_EQ$: cash distributed to shareholders. To mitigate heteroskedasticity the above items are deflated by lagged assets.

3.2.3 Decomposing the change in financial assets ($\Delta CASH$)

In this section, using the Batis et al. [16] approach, the change in financial assets ($\Delta CASH$) is decomposed into normal and abnormal components. For this purpose, the following model is firstly estimated:

$$\Delta CASH_{it} = \alpha + \delta_1 INDFCF_{it} + \delta_2 \Delta MTB_{it} + \delta_3 \Delta SIZE_{it} + \delta_4 \Delta FCF_{it} + \delta_5 \Delta NWC_{it} + \delta_6 \Delta CAPEXP_{it} + \delta_7 \Delta LEV_{it} + \delta_8 D\Delta DIV_{it} + \varepsilon_{it} \quad (3)$$

where $INDFCF$: the standard deviation of the free cash flow of an industry companies in year t (the standard deviation of the cash flow adjusted by the beginning assets for the last three years, i.e., $t-2$, $t-1$, t), ΔMTB : change in firm growth (change in market value to book value ratio), $\Delta SIZE$: change in company size (change in logarithm of book value of assets), ΔFCF : change in free cash flow, ΔNWC : change in net working capital, $\Delta CAPEXP$ change in capital expenditure (the change in non-current assets), ΔLEV change in leverage ratio (total debts to total assets), and $D\Delta DIV$ is dummy variable, if the change in dividend is positive, the value is 1, otherwise 0. After estimating the above model, the residual is abnormal changes in financial assets ($ABN\Delta CASH$) and is calculated by deducting from the dependent variable, the normal changes in financial assets ($N\Delta CASH$). Moreover, the positive and negative values of the normal and abnormal changes in financial assets are also considered as follows, respectively:

$$\begin{aligned} N\Delta CASH_{it} &= N\Delta CASH_{it}^- + N\Delta CASH_{it}^+ \\ ABN\Delta CASH_{it} &= ABN\Delta CASH_{it}^- + ABN\Delta CASH_{it}^+ \end{aligned} \quad (4)$$

3.2.4 Decomposing the accruals

In this section, using the Kothari et al. [20] model, accruals are decomposed into discretionary (abnormal) and non-discretionary (normal) sections:

$$ACC_{it} = \alpha + \beta_1 \frac{1}{A_{it-1}} + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \varepsilon_{it} \quad (5)$$

where ΔREV : change in sales, ΔREC : changes in accounts and receivables, and PPE of property, machinery and equipment that are deflated by lagged assets. In addition, ROA is the net profit ratio to the total assets of the period beginning. After estimating the above model, the residual is equivalent to discretionary accruals ($DACC$ s). By deducting discretionary accruals from total accruals, non-discretionary accruals ($NDACC$) are achieved. In the following, the increasing and decreasing (positive and negative) amounts of discretionary accruals (as $DACC^+$ and $DACC^-$), as well as increasing and decreasing (positive and negative) non-discretionary accruals ($NDACC^+$ and $NDACC^-$ respectively) are also considered:

$$\begin{aligned} DACC_{it} &= DACC_{it}^- + DACC_{it}^+ \\ NDACC_{it} &= NDACC_{it}^- + NDACC_{it}^+ \end{aligned} \quad (6)$$

3.3 Analyzing the hypotheses

Mishkin's test is presented to assess rational pricing (assumptions about market efficiency) in macroeconomics. In accounting, the Mishkin's test [22] is utilized to examine whether the market's expectations

of earnings and its components (in the process of stock price formation) are identical with the objective expectations of earnings and its components (according to historical data). Here, to analyze the research hypotheses following the Mishkin's [22] test the equations system is simultaneously estimated with the seemingly unrelated regression.

3.3.1 Mishkin's test [30]

It can be said that earnings is the most important number generated in the accounting system. Of course, it should be noted that in addition to the numerical value of earnings, its quality should also be considered. Various components have been proposed for the quality of earnings. One of these components is called the sustainability of earnings. The stability of earnings refers to the stability and non-reciprocity of the earnings number and is usually calculated using the regression equation (7):

$$Earnings_{t+1} = \alpha_0 + \alpha_1 Earnings_t + \varepsilon_{t+1} \quad (7)$$

In which, $Earnings_{t+1}$: profits of the future period and $Earnings_t$: the current period profits, both of which are homogeneous using the stock market value or the book value of the assets at the beginning of the period. In the above equation, the coefficient α_1 is called the coefficient of stability or objective stability coefficient. The larger the value of α_1 , the earnings of more sustainability and, consequently, of higher quality. On the other hand, investors in the process of stock exchanges (without using the above equation) always have a mental understanding of the sustainability of a firm's earnings, and this applies to the stock market analysis for exchanges. Sustainability is defined as the sustainability that the investor has in mind for a company's earnings. To calculate the investors' mental stability, the non-linear equation (8) is used:

$$URet_{t+1} = \beta(Earnings_{t+1} - \alpha_0 - \alpha_1^* Earnings_t) + e_{t+1} \quad (8)$$

In the above equation, $URet_{t+1}$ is the return (or abnormal return) of the stock at the end of the period. In this statement, the coefficient α_1^* shows the amount of investor's mental stability in terms of profits. as the dependent variable of the above model is present as an independent variable in this model, for the estimation of the parameters of the two models, the equation system (9) must be estimated:

$$\begin{cases} Earnings_{t+1} = \alpha_0 + \alpha_1 Earnings_t + \varepsilon_{t+1} \\ URet_{t+1} = \beta(Earnings_{t+1} - \alpha_0 - \alpha_1^* Earnings_t) + e_{t+1} \end{cases} \quad (9)$$

In the above equations, the first equation is called the forecasting equation and the second equation is called the valuation (pricing) equation. When the capital market is efficient in terms of information, it is expected that objective and subjective stability is not significantly different (i.e., $\alpha_1 = \alpha_1^*$). In this case, it is said that there is no mispricing or anomalies. In other words, if the limit $\alpha_1 = \alpha_1^*$ is established, the capital market is said to be effective in accounting earnings information. This can be extended to components of cash and accrual, as well as their components. The mispricing literature in accounting is rooted in rational pricing studies in the field of financial economics. Now, to analyze the hypothesis, the system of the above equations is estimated by nonlinear least squares method. To obtain the coefficients β and α_1 , it is necessary to assume that α_0 is the same in both equations. If $\alpha_1 = \alpha_1^*$, then the sum of squares of the sum of restricted residual square (SRRS) (where α_1 is equal to α_1^*) should not be significant from the sum of unrestricted residual square (SURS) (where α_1 is not equal to α_1^*). Mishkin [22] show that this limitation can be tested using the following likelihood ratio (which, under the zero assumption, has an asymptotic distribution of $\chi^2(q)$): q is the number of constraints governing the system of the above equations.

$$LR = 2n \ln(SSR^c / SSR^u) \quad (10)$$

Where n is the number of observations of each of the equations (and $2n$ is the total number of observations). The significance of the LR statistic means that there is a significant difference between α_1 and α_1^* [2]. Subsequently, based on the above concepts, simultaneous equation systems are formulated to investigate the research hypotheses.

3.3.2 Market efficiency based on the normal and abnormal components

In order to investigate whether the capital market, information about the positive and negative values of the normal and abnormal components of the changes in financial assets is effective in the stock pricing process, the first and second hypotheses of the research are developed and implemented using the system of equations (1):

$$\begin{cases} Earnings_{it+1} = \varphi_0 + \varphi_1 ACC_{it} + \varphi_2 \Delta CASH_{it}^+ + \varphi_3 \Delta CASH_{it}^- + \varphi_4 ABN \Delta CASH_{it}^+ + \varphi_5 ABN \Delta CASH_{it}^- \\ \quad + \varphi_6 DIST_D_{it} + \varphi_7 DIST_EQ_{it} + \varepsilon_{it+1} \\ ARET_{it+1} = \beta \left(Earnings_{it+1} - \varphi_0 - \varphi_1^* ACC_{it} - \varphi_2^* \Delta CASH_{it}^+ - \varphi_3^* \Delta CASH_{it}^- - \varphi_4^* ABN \Delta CASH_{it}^+ \right. \\ \quad \left. - \varphi_5^* ABN \Delta CASH_{it}^- - \varphi_6^* DIST_D_{it} - \varphi_7^* DIST_EQ_{it} \right) + e_{it+1} \end{cases}$$

In which Earnings: the operating profit and it deflated by lagged assets, ARET: the abnormal return and equivalent to the 16-month return on equity (from the beginning of the fiscal year to the fourth month after the fiscal year), minus the average return on the market (equivalent to the change in the cash and price index). In the equations, the first equation is the forecasting equation and the second equation is called the equation of pricing. The variable coefficients of the first equation represent the actual stability and, in the second equation, indicate the sustainability level estimated by the investors, [21].

In the above system, according to Mishkin test, the system of simultaneous equations with estimated seemingly unrelated regression estimators, if $\varphi_2 = \varphi_2^*$ ($\varphi_3 = \varphi_3^*$), states that the market is relative to the positive (negative) information of normal component of the change in financial assets functions effectively. In addition, if $\varphi_4 = \varphi_4^*$ ($\varphi_5 = \varphi_5^*$), it is argued that the market acts as an abnormal part of the changes in financial assets as positive (negative) information.

3.3.3 Market efficiency based on the discretionary and non-discretionary accruals

For the purpose of examining whether the capital market considers the information of the positive and negative sections of the discretionary and non-discretionary accruals as effective in the stock pricing process, the third and fourth hypotheses are formulated and tested by the system of equations (2):

$$\begin{cases} Earnings_{it+1} = \varphi_0 + \varphi_1 DACC_{it}^+ + \varphi_2 DACC_{it}^- + \varphi_3 NDACC_{it}^+ + \varphi_4 NDACC_{it}^- + \varphi_5 FCF_{it} + \varepsilon_{it+1} \\ ARET_{it+1} = \beta (Earnings_{it+1} - \varphi_0 - \varphi_1^* DACC_{it}^+ - \varphi_2^* DACC_{it}^- - \varphi_3^* NDACC_{it}^+ - \varphi_4^* NDACC_{it}^- - \varphi_5^* FCF_{it}) + e_{it+1} \end{cases}$$

In the system, if $\varphi_1 = \varphi_1^*$ ($\varphi_2 = \varphi_2^*$), it is stated that the market operates effectively than the positive (negative) information of discretionary accruals. In addition, if $\varphi_3 = \varphi_3^*$ ($\varphi_4 = \varphi_4^*$), it is argued that the market behaves efficiently in relation to the information of the positive (negative) part of non-discretionary accruals (following the test by Mishkin [30] and Kraft et al. [33]).

4 Research Findings

4.1 Descriptive Statistics

The descriptive statistics relevant to research variables are provided in Table 1. The results indicate that in the period, the abnormal returns of the shares of the companies under review were on average 0.119,

operating profit 0.169 of the beginning assets, the total accruals, discretionary and non-discretionary accruals are also equal to 0.187, -0.003, and .189, respectively.

Table 1: Descriptive Statistics of Research

<u>Notations</u>	<u>Average</u>	<u>Median</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Standard De- viation</u>
ARET	0.119	0.023	2.401	-1.486	0.750
Earnings	0.169	0.145	0.481	-0.116	0.151
ACC	0.187	0.154	0.676	-0.198	0.216
DACC	-0.003	0.009	0.313	-0.474	0.132
NDACC	0.189	0.170	0.583	-0.199	0.168
DACC ⁻	-0.050	0.000	0.000	-0.474	0.090
DACC ⁺	0.047	0.009	0.313	0.000	0.067
NDACC ⁻	-0.009	0.000	0.000	-0.199	0.033
NDACC ⁺	0.198	0.170	0.583	0.000	0.153
ΔREV-ΔREC	0.090	0.065	0.636	-0.361	0.241
PPE	0.303	0.245	0.877	0.032	0.217
ROA	0.139	0.118	0.456	-0.192	0.154
FCF	-0.015	-0.016	0.209	-0.242	0.108
ΔCASH	0.011	0.003	0.150	-0.075	0.048
DIST_D	-0.088	-0.066	0.220	-0.536	0.148
DIST_EQ	0.063	0.036	0.210	0.000	0.068
NΔCASH	0.009	0.008	0.042	-0.020	0.012
ABNΔCASH	0.002	-0.002	0.136	-0.092	0.045
NΔCASH ⁻	-0.001	0.000	0.000	-0.020	0.004
NΔCASH ⁺	0.010	0.008	0.042	0.000	0.010
ABNΔCASH ⁻	-0.015	-0.002	0.000	-0.092	0.023
ABNΔCASH ⁺	0.017	0.000	0.136	0.000	0.032
INDFCF	0.099	0.098	0.197	0.013	0.029
ΔMTB	-0.449	-0.240	-4.747	-6.442	2.348
ΔSIZE	0.068	0.060	0.252	-0.074	0.080
ΔFCF	0.009	0.009	0.296	-0.265	0.140
ΔNWC	0.002	0.005	0.315	-0.382	0.152
ΔCAPEXP	-0.017	-0.017	0.266	-0.291	0.117
ΔLEV	0.002	0.004	0.274	-0.204	0.102
DΔDIV	0.544	1.000	1.000	0.000	0.498
ARET: Abnormal returns Earnings: profit FCF :Free Cash flow from cash flows from operating activities and investments ΔCASH: Changes in financial assets DIST_D: Cash distributed to creditors DIST_EQ: Cash distributed to equity NΔCASH: the normal changes in financial assets NΔCASH ⁺ :The positive value of the normal changes in financial assets ABNΔCASH: the abnormal changes in financial assets ABNΔCASH ⁻ :The negative value of the abnormal changes in financial assets			ABNΔCASH ⁺ :Abnormal Positive Amounts of Changes in Financial Assets INDFCF: Standard deviation of free cash flow ΔMTB: Change in company growth ΔSIZE: Change in company size ΔFCF: Change in free cash flow ΔNWC: Change in net working capital ΔCAPEXP: Changes in capital expenditures ΔLEV: Change in leverage ratio DΔDIV: Dummy variable, Changes in the amount of dividend ACC : Accruals are equivalent to operational profit minus free cash flow		

In addition, the average of negative accrual is -0.050, the average of positive accruals 0.047, and the average negative non-discretionary accruals -0.009 and the average positive non-discretionary accruals 0.198. The mean and median the difference between the changes in sales and accounts and receivables

are 0.09 and 0.065 respectively, the average property, machinery and equipment is 0.303 and net profit is 0.139. The results show that the average free cash flow is 0.015, the average of changes in financial assets is 0.011. The average of the normal and abnormal changes in financial assets is 0.009 and 0.002, respectively, from the values of -0.001 to 0.01, respectively, related to the normal negative and positive changes of financial assets and -0.015 and 0.017 related to abnormal negative and positive changes of financial assets.

In addition, the mean(median) of the dispersion of the free cash flow of companies was 0.099 (0.098), the changes in the company's growth opportunities -0.449(-0.240), the changes in the company size 0.068(0.060), the changes in the free cash flow 0.009(0.009), the net changes in working capital 0.002(0.005), the changes in capital expenditures -0.017 (-0.017) and changes in the leverage ratio was 0.002 (0.004). Note that the distribution of observations of the research variables is provided in the final column of Table 1.

4.2 The results of model (3) estimation and analysis of changes in financial assets

In order to decompose the changes in financial assets, model (3) is estimated using a combined data approach. The insignificant Chow statistic (0.624) reveals that in estimating model (3), the joint effect pattern on the fixed effect pattern is prioritized. Moreover, the insignificant of Breusch–Pagan test (0.958) shows the priority of the pattern of joint effects on the pattern of random effects.

Table 2: The Results of Estimation of Model (3)

$\Delta\text{CASH}_{it} = \alpha + \delta_1\text{INDFCF}_{it} + \delta_2\Delta\text{MTB}_{it} + \delta_3\Delta\text{SIZE}_{it} + \delta_4\Delta\text{FCF}_{it} + \delta_5\Delta\text{NWC}_{it} + \delta_6\Delta\text{CAPEXP}_{it} + \delta_7\Delta\text{LEV}_{it} + \delta_8\Delta\text{DIV}_{it} + \varepsilon_{it}$				
Variable	Coefficient	t-student	Significant level	VIF
constant	0.002	1.270	0.204	---
INDFCF_{it}	-0.038	-1.838	0.066	1.035
ΔMTB_{it}	-0.272	-0.834	0.405	1.175
ΔSIZE_{it}	0.119	17.129	0.000	1.423
ΔFCF_{it}	-0.016	-2.835	0.005	1.109
ΔNWC_{it}	0.055	9.682	0.000	1.954
ΔCAPEXP_{it}	0.001	0.221	0.825	1.379
ΔLEV_{it}	0.041	5.536	0.000	1.823
ΔDIV_{it}	0.035	3.382	0.001	1.042
Adjusted coefficient of determination	44.88%		Chow statistics	0.624(0.836)
Fisher's statistic	100.420 (0.000)		Breusch–Pagan test	0.958 (0.328)
Durbin-Watson test	2.120		White test	15.242 (0.000)

The results of the model (3) estimation indicate that the coefficient of variables of the changes in the size of the company (0.119), the changes in the free cash flow (-0.016), the net changes in working capital (0.055), and the changes in leverage ratio (0.041), the dummy variable of increase in cash payout (0.035) are all of them significant at 1% level. The value of the index of inflation factor variance also reveals that the independent variables of model (3) did not have a collinearity problem. Besides, the Fisher's statistic (100.420) was significant at 1% level, which shows the model estimation was significant. The amount of Durbin-Watson (2.102) statistics suggests that there is no first-order serial autocorrelation in the residual term of model. Furthermore, as White test was significant (15.242), it indi-

cates the existence of a heteroscedastic variance in the residual term of model (3). As a result, heteroscedastic problem with the application of the generalized least squares approach was resolved. The adjusted coefficient of determination also shows that independent variables in total account explain 44.88% of the variation of dependent variable. After estimating model (3), the residual value is equivalent to an abnormal change in financial assets. By deducting the residuals from the dependent variable, the normal changes are achieved for the financial assets.

4.3 The Results of Model Estimation (5) and Decomposing of the Accrued Earnings

To decompose the accrual section of earnings, the model (5) is estimated using combined data approach. The significance of Chow statistics (2.880) at 1% level indicates that in the estimation of model (5), the effect pattern of the joint effects pattern is prioritized. In addition, the significance of Breusch–Pagan test (16.360) at 1% level reveals the priority of the pattern of random effects on the pattern of joint effects. The insignificant Hausman statistic (3.725) indicates that the pattern of random effects is superior to the fixed effect pattern. As a result, the model (5) is estimated using the random effects model and its results are reported in Table 3.

Table 3: The Results of Estimation of Model (5)

$ACC_{it} = \alpha + \beta_1 \frac{1}{A_{it-1}} + \beta_2(\Delta REV_{it} - \Delta REC_{it}) + \beta_3 PPE_{it} + \beta_4 ROA_{it} + \varepsilon_{it}$				
Variable	Coefficient	t-student	significant level	VIF
constant	0.008	0.925	0.355	---
$1/A_{it-1}$	-1118.569	-1.953	0.051	1.004
$\Delta REV_{it} - \Delta REC_{it}$	0.159	8.073	0.000	1.099
PPE_{it}	0.124	7.069	0.000	1.007
ROA_{it}	0.969	30.392	0.000	1.099
Adjusted coefficient of determination	61.89%		Chow statistics	2.880(0.000)
Fisher's statistic	716.742 (0.000)		Breusch–Pagan test	16.360 (0.000)
Durbin-Watson test	1.600		Hausman statistic	3.725 (0.445)
White test	32.953 (0.000)			

The results of model estimation (5) indicate that the difference coefficient of variation of sales and changes in accounts and receivables (0.159), property, machinery and equipment (0.124) and return on assets (0.969) are significant at 1% level. The value of the variance inflation factor (VIF) also shows that the independent variables of model (5) do not have a collinearity problem. Fisher's statistic (716.742) at 1% level indicates a general significance of the model. The value of the Durbin-Watson (1.600) statistic indicates that there is no first-order serial autocorrelation in the residual term of model. In addition, White's statistical significance (32.953) indicates the existence of a heteroscedastic variance in the residual term of model (5). Thus, heteroscedastic problem with the application of the generalized least squares approach was resolved. The adjustment R^2 also shows that the independent variables in total account explain 61.89% of the variations of the dependent variable. After estimating the model (5), the residual value is equivalent to discretionary accruals. The discretionary accruals are deducted from total accruals, based on which the non-discretionary accruals are obtained.

4.4 The Results of Estimating the Equations System (1)

In order to investigate the issue whether the capital market considers the information of the positive and negative sectors of the normal and abnormal changes in financial assets as effective in the stock pricing process, the equation system (1) is estimated. Afterwards, the Mishkin test [30] is utilized to compare

the coefficients in the prediction and valuation equation. The computational results are provided in Table 4.

Table 4: The Results of Estimation of Equation System (1)

Variables/Equations	Estimation equation			valuation equation			Mishkin test
	Coefficient φ	Statistic t	Significant level	Coefficient φ^*	Statistic t	Significant level	
	$\left\{ \begin{array}{l} \text{Earnings}_{it+1} = \varphi_0 + \varphi_1 \text{ACC}_{it} + \varphi_2 \text{N}\Delta\text{CASH}_{it}^+ + \varphi_3 \text{N}\Delta\text{CASH}_{it}^- + \varphi_4 \text{ABN}\Delta\text{CASH}_{it}^+ + \varphi_5 \text{ABN}\Delta\text{CASH}_{it}^- \\ \quad + \varphi_6 \text{DIST}_{Dit} + \varphi_7 \text{DIST}_{EQit} + \varepsilon_{it+1} \\ \text{ARET}_{it+1} = \beta \left(\begin{array}{l} \text{Earnings}_{it+1} - \varphi_0 - \varphi_1^* \text{ACC}_{it} - \varphi_2^* \text{N}\Delta\text{CASH}_{it}^+ - \varphi_3^* \text{N}\Delta\text{CASH}_{it}^- - \varphi_4^* \text{ABN}\Delta\text{CASH}_{it}^+ \\ \quad - \varphi_5^* \text{ABN}\Delta\text{CASH}_{it}^- - \varphi_6^* \text{DIST}_{Dit} - \varphi_7^* \text{DIST}_{EQit} \end{array} \right) + e_{it+1} \end{array} \right.$						
Intercept	0.039	7.23	0.000	0.039	7.23	0.000	
ACC_{it}	0.435	6.85	0.000	0.620	20.23	0.000	85.678 (0.000)
$\text{N}\Delta\text{CASH}_{it}^+$	0.740	1.27	0.201	0.730	0.87	0.379	2.7350 (.098)
$\text{N}\Delta\text{CASH}_{it}^-$	0.212	2.54	0.011	0.287	0.13	0.890	2.469 (0.116)
$\text{ABN}\Delta\text{CASH}_{it}^+$	0.220	0.69	0.484	0.636	4.88	0.000	34.904 (0.000)
$\text{ABN}\Delta\text{CASH}_{it}^-$	0.874	5.64	0.000	0.951	2.43	0.015	25.539 (0.000)
DIST_{Dit}	0.519	11.43	0.000	0.535	4.77	0.000	1.822 (0.177)
DIST_{EQit}	0.865	14.37	0.000	0.946	8.23	0.000	48.996 (0.000)
β				3.085	12.69	0.000	
Adjusted coefficient of determination		61.39%			14.82%		
Durbin-Watson test		1.783			1.687		

The estimation results of the prediction equation reveal that intercept (0.039) and the coefficient of the total accruals (0.435), abnormal negative changes in financial assets (0.874), distributed cash among creditors (0.519) and distributed cash among owners (0.865), all of them are significant at 1% level and negative section coefficients of normal changes in financial assets (0.212) are significant at 5% level and in total account for about 61.39% of operational profit change variations. Besides, the Durbin-Watson value (1.783) shows that the no first-order serial autocorrelation in the residual term of the prediction equation. Moreover, the results of estimating the valuation equation show that intercept (0.039) and the coefficient of total accruals (0.620), the positive part (0.636) and the negative part (0.951) of abnormal changes in financial assets. The cash distributed among creditors (0.535) and distributed cash among owners (0.946) all of them are significant at 1% level and in total account, which explain 14.82% of abnormal returns. Furthermore, the Durbin-Watson value (1.687) indicates that the no first-order serial autocorrelation in the residual term of the valuation equation.

Comparing the positive-factor coefficient of the normal changes in financial assets in prediction (0.740) and valuation equations (0.730), the insignificance of Mishkin's statistics (2.735) indicates that there is no significant difference between two variables. This reveals that the capital market considers

positive section information of the normal changes in financial assets to be effective in the process of stock pricing, and market participants correctly measure the sustainability of that sector. As such, the first hypothesis of the research is confirmed. Moreover, the insignificance of Mishkin's statistics (2.469) is used to compare the negative section of normal changes in financial assets in prediction equation (0.212) and valuation (0.287), which also indicates capital market efficiency in information analysis of this variable. As a result, the second hypothesis of the research is confirmed. Nevertheless, in comparing the positive-factor coefficient of abnormal changes in financial assets in the prediction equations (0.220) and valuation (0.636), the significance of Mishkin's statistic (34.904) at 1% indicates that there is a significant difference between the two values. This suggests that the capital market does not consider positive section information of abnormal changes in financial assets to be effective in the stock pricing process. In addition, the higher the coefficient of the above variable in the valuation equation to the prediction equation reveals that the capital market makers estimate the sustainability of this sector overstate and are over reaction towards it; therefore, the third hypothesis is rejected. Besides, the as the Mishkin's test (25.539) was significant, in order to compare the negative part of abnormal changes in financial assets in prediction equations (0.874) and valuation (0.954), it also shows the inefficiency of capital market in information analysis of this variable. Therefore, the fourth hypothesis is also rejected.

4.5 The Results of Estimating the Equations System (2)

To examine whether the capital market considers the information of the positive and negative sections of discretionary and non-discretionary accruals to be effective in the stock pricing process, the equations system (2) is estimated. To compare the coefficients in the prediction and valuation equations, Mishkin's test [30] was utilized.

The results of the estimation of the prediction equation show that intercept (0.025) and the positive (0.441) and negative (0.474) section coefficient of discretionary accruals and the positive (0.505) and negative (0.432) sections of non-discretionary accruals and free cash flow (0.792) are significant at 1% level and account, which explain 55.26% of operating profit changes. Besides, the value of the Durbin-Watson test (1.964) shows that the no first-order serial autocorrelation in the residual term of the prediction equation. In addition, the results of the estimation of the valuation equation show that the width from the origin (0.025) and the positive (0.763) and the negative (0.465) section coefficient of discretionary accruals and the positive (0.662) and the negative (0.375) sections of non-discretionary accruals and free cash flow (0.791) were significant at 1% level, which explain a total of about 16% of abnormal returns. Furthermore, the value of the Durbin-Watson test (1.907) indicates the no first-order serial autocorrelation in the residual term of the valuation equation. By comparing the positive component of the variable of discretionary accruals in the predictive equations (0.441) and the valuation (0.763), the significance of the Mishkin's test (21.101) at 1% indicates that there is a significant difference between two variables. This suggests that the capital market does not consider the positive section information of the discretionary accruals to be effective in the stock pricing process. Therefore, the fifth hypothesis is rejected. However, in comparison to the negative section component of the variable of discretionary accruals in predictive (0.474) and valuation (0.465) equations, the insignificant of the Mishkin's test (2.099) indicates that there is no significant difference between two values. This reveals that the capital market considers the negative section information of the discretionary accruals to be effective in the stock pricing process, and market capitalists correctly measure the sustainability of that segment. So

the sixth hypothesis is confirmed. By comparing the coefficient of the positive portion of non-discretionary accruals in prediction (0.505) and valuation (0.662) equations, the significance of Mishkin's test (6.497) at 5% indicates a significant difference between these two values.

Table 5: The Results of Estimation of Equation (2)

Variables/Equations	Estimation equation		valuation equation		Mishkin's test
	Coefficient	Significant	Coefficient	Significant	
Intercept	0.025	0.000	0.025	0.000	
$DACC_{it}^+$	0.441	0.000	0.763	0.000	21.101 (0.001)
$DACC_{it}^-$	0.474	0.000	0.465	0.001	2.099 (0.147)
$NDACC_{it}^+$	0.505	0.000	0.662	0.000	6.497 (0.011)
$NDACC_{it}^-$	0.432	0.000	0.675	0.003	0.568 (0.451)
FCF_{it}	0.792	0.000	0.791	0.000	6.373 (0.012)
β			2.675	0.000	
Adjusted coefficient of determination	55.26%		16%		
Durbin-Watson test	1.964		1.907		

This shows that the capital market does not consider the positive section information of non-discretionary accruals to be effective in the stock pricing process, so the seventh hypothesis is rejected. Nevertheless, in comparison to the negative component of non-discretionary accruals in prediction (0.432) and valuation (0.375) equations, the insignificance of Mishkin's test (0.568) indicates that there is no significant difference between these two numbers.

Table 6: A Schematic of All Obtained Results

Information of decreasing (negative) values of components cash and accruals of earnings	Result of efficiency test	Reaction of market practitioners to stability of decreasing values of earnings elements	Information of increasing (positive) values of components cash and accruals of earnings	Result of efficiency test	Market reaction
Information of negative part of non-discretionary accruals	Efficient	Correct estimate	Information of positive part of non-discretionary accruals	Inefficiency	Over reaction
Information of negative part of discretionary accruals	Efficient	Correct estimate	Information of positive part of discretionary accruals	Inefficiency	Over reaction
Negative part of normal changes in financial assets	Efficient	Correct estimate	Positive part of normal changes in financial assets	Efficient	correct estimate
Negative part of abnormal changes in financial assets	Inefficiency	Over reaction	Positive part of abnormal changes in financial assets	Inefficiency	Over reaction

This suggests that the capital market considers the negative section information of non-discretionary accruals to be effective in the stock pricing process, and market capitalists correctly measure the sustainability of that segment. Therefore, the eighth hypothesis confirmed.

5 Conclusion

This research analyzed the capital market's efficiency relative to the information of decreasing and increasing the components of cash and accrual accounting earnings. Information on decreasing and increasing amounts of the normal and abnormal portion of the changes in financial assets as a cash component of the earnings was compared with the information on the decreasing and increasing amounts of discretionary and non-discretionary accruals. The results show that if the capital market participants had an established view of decreasing information and generating components of accounting earnings, they won't be able to analyze the increasing and decreasing components of earnings components. Besides, they will be mispricing of the companies, while their awareness will cause inefficiency. Therefore, the necessity of paying attention to cash and accruals components when valuing shares of companies was raised. The results also indicate that the normal changes in cash are both decreasing and increasing predictable for investors, and there is no difference in market expectations with its objective expectations regarding this information, which is consistent with the results of Chen and Shane 2014. Based on the obtained results, it can be concluded that investors are aware of the increasing and decreasing amounts of normal changes in cash, and their awareness has been accurate and timely response to this information. Moreover, investors do not anticipate the increasing and decreasing amounts of abnormal changes in cash correctly, so they have done more than magnitude and incorrect responses to the increase and decrease in abnormal changes in response rates, which would result in a difference between the stock price and its intrinsic value and inefficiency. This is a sign of the inability of the Iranian capital market to disclose information published in this regard. In addition, based on the results of the implemented tests, it can be argued that the market's expectations from some of the information and the abnormal components of the changes in financial assets as an earnings cash segment (in the process of formation of stock prices) differ from its objective expectations, and market expectations are not rational. The reaction of investors has led to the creation of market inefficiencies from time to time. In terms of accruals, the results show that the market is efficient for information that reduces accruals, both normal and abnormal, is not effective at increasing sector information. Such information seems to be ineffective because of the lack of optimistic information that affects investors more and the difference between market expectations. There is no objective expectation regarding this information. However, in the case of increasing information on accruals, the result is reversed, and this information has been inspired by the optimistic view of increasing earnings as an emotional and reactive response. It can be argued that the excitement generated by investors and the improvement of the order and balance of the market and the acquisition of the price of intrinsic value. The stock of information about accruals depends more on the information than on the normal and abnormal nature of this information. Nevertheless, this is not the case with the normal and abnormal changes in cash, and the reaction of investors to the sustainability of these amounts and the efficiency of the market and the absence of the market is not dependent on the increase and decrease of this information. However, the normal and abnormal nature of the changes in this component causes an unusual reaction of investors and the obtaining of price in the pricing process. Thus, in order to increase the efficiency of the capital market, it is necessary to have a more complete analysis of the information about the amounts of accruals that are expected to be distributed symmetrically, the information on the increase of these components, as well as on the informative and quantitative data of abnormal cash changes, the field for the correct pricing of these items and the proper response of investors, and increasing efficiency. The Securities and Exchange Organization offers investigating the stock exchange that no more profitable analyzez, which

are made available to investors so that they can react more rationally to the sustainability of cash components and liabilities, and their rational responses will make the marketer more efficient.

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