



Original Research

## The Role of Managers' information Interpretation on Cost Behavior

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### ABSTRACT

This study aimed to investigate the role of managers' information interpretation on cost behavior. The locative domain of this research is the companies listed in the Tehran Stock Exchange during 2014-2020 and through systematic elimination method, 112 companies have been selected as statistical sample. Managers' information interpretation is considered as an independent variable and cost behavior is considered a dependent variable. The current research is applied research, and if the classification of types of researches be considered based on the nature and method, the method of the present study is essentially descriptive in terms of the nature, and in terms of the method is considered in correlation researches category. In this study, library method was used to collect data. In the research data section, data was collected through collecting data of sample companies by referring to financial statements, explanatory notes and stock exchange magazine. In order to describe and summarize the data collected, the descriptive and inferential statistics are used. In order to analyze the data, variance heterogeneity pre-test, F Leimer test, Hausman test and Jarque-Bera test and then multivariate regression test were used to confirm and reject the research hypotheses (EViews software). The results showed that the extent of effectiveness of managers' information interpretation factors, including changes in managers' consensus on profit, changes in public profit information, changes in private profit information, and changes in bias in profit forecasting on cost behavior in potentially competitive conditions are different from de facto competition. The results obtained in this research are consistent with the documents mentioned in the research theoretical framework and financial literature.

## 1 Introduction

The previous literature has found a lot of evidence about the effect of cost asymmetry on various financial variables that have been considered by users of domestic and foreign financial statements. Evidence supports the prevailing theoretical argument in the literature that management expectations motivate decisions that affect the cost structure of companies. According to studies, many studies have been conducted with large samples in the field of factors affecting the asymmetry of costs, while so far, the role of managers' information interpretation at different levels of information competition between informed investors has not been considered.

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Behavioral financial researches focus on the degree of influence and effectiveness of senior managers' interpretations, in line with agency theory that managers are motivated to act in the interests of owners to reduce supervision costs; therefore, the interpretation of information by management in financial reporting seems to have an effect on corporate decisions. Martikainen, et al. The basic hypotheses of the accounting literature state that the relationship between costs and the volume of activities to increase or decrease the volume is symmetrical, and the amount of change in costs depends on the amount of change in the level of activities, regardless of change direction [22]. Some researchers have challenged this hypothesis by presenting the phenomenon of cost stickiness in terms of sales, public and administrative costs, stating that the amount of increase in these costs is associated with an increase in economic activity, and this increase is more than the amount of reduction in costs associated with its equivalent reduction in economic activity [25]. Anderson et al. found that when current sales increase, costs will increase, and this increase is greater than the decrease in costs due to reduced sales. [4] They define this cost behavior as cost stickiness, and speculate that companies experience this cost stickiness because managers increase their resources as sales increase but make decisions to maintain unused resources, as this increase in current sales is expected to be temporary. In this way, they seek to minimize their current and future moderation costs [5]. Previous research on cost stickiness has been classified into three categories: The first category includes studies that focus more on the impact of economic factors on cost stickiness. According to the results of this type of researches, economic reason assumes that when a level of sales decreases, managers make a trade-off between their expectations of future demand and the level of cost moderation to decide whether to reduce or maintain cost resources. This is also called as balance. In this group, "deliberate or conscious decision theory", in decision making, researchers such as Anderson, Anderson and Banker, Banker and Byzalov, Balakrishnan and Gruca Namazi and Davanipour Namazi, Ghaffari and Fereydoni, Kurdistan and Mortazavi, Bulu et al., Mj-tahedzadeh and Farshi are included. Managerial attitudes may reduce cost stickiness to achieve predicted profits, or managers' opportunistic and domineering motives may lead to asymmetries in sales and administrative costs (cost stickiness) [21,6]. Individuals and organizations involved in this issue are investors, shareholders and managers of companies, as well as researchers and students interested in conducting similar researches and other companies and organizations. The present study seeks to examine the interpretation of managers' information on cost behavior by analyzing real information to extract criteria to guide investors by their knowledge in investing and buy with more confidence. Therefore, the main question of this research can be raised as to what effect the interpretation of managers' information has on the cost behavior and what is the role of levels of informational competition between informed investors on the relationships between these variables?

## **2 Theoretical Foundations and Research Background**

According to traditional theories of cost behavior, cost changes depend only on the amount of change in the level of activity, and these changes occur symmetrically, while the theory of cost stickiness challenges the above issue and states the amount of cost reduction, when the activity decreases is less than the increase in costs due to the increase in activity. On the other hand, agency theory implicitly states that a certain risk coverage policy can have a significant impact on the value of the company. One of the main assumptions of agency theory is that employers and brokers have conflicting interests. Managers prefer to pursue their own interests, such as earning the highest possible reward, and do not pay attention to the long-term interests of shareholders. This problem of agency shows the necessity of controlling the management of companies by shareholders. Another fundamental and important assumption of agency theory is that it is very difficult and costly for employer to approve the work of

brokers [7]. The efficient market theory also examined by Fama in January 1965 states that the efficient market is a market that reacts quickly to new information and adjusts itself. The main purpose of financial reporting is to meet the information needs of investors. Investors in the stock market are always looking for high profits. In analyzing financial statements, analysts usually use the current growth and profitability of the company as a starting point to predict future growth and profitability. Shah Alizadeh et al., The presence of sufficient information in the market and its rapid reflection on the price of securities is closely related to market efficiency [23]. Analysts have access to some of the new section information before it is made available to the public. After deciding to forecast future profits, analysts tend to rely more on common information [8]. Analysts need to process disclosures using their own special knowledge and skills. Analysts have heterogeneous informational backgrounds, knowledge, and skills, these analyzes may be different and cause analysts' revenue forecast to contain relatively more information after these disclosures. Thus, the financial statement is expected to be related to the degree to which analysts place their revenue forecasts on public information [7]. Previous research on cost stickiness has been classified into three categories; the first is the impact of economic factors on cost stickiness and the fact that managers trade between their expectations of future demand and the level of cost adjustment when sales are reduced to make decisions about reducing or maintaining cost resources. In this group of deliberate or conscious decision theory, researchers such as; [3]. Anderson and Banker are included. Managerial attitudes may reduce cost stickiness to achieve projected profits, or managers' opportunistic and domineering motivations may lead to asymmetries in sales and administrative costs (cost stickiness) [4]. In this group, researchers such as; Dierynck and Landsman; Bahar Moghaddam and Khademi are included. In the third group, researchers introduce the behavioral factor of management overconfidence as the cause of cost stickiness [14,5]. Researchers in this group try to provide empirical evidences on the role of management behavior in cost management [1]. By presenting the relevant theoretical foundations, in the following the research done inside and outside the country is referred to. In this regard, Kurdistan and Saber show that with increasing competition in the product market, asymmetry in cost behavior increases and the manager's optimism on the future sales increases the positive effect of competition in the product market on the asymmetry in cost behavior. Khani et al found that the level of positive expectations of managers causes the severity of cost stickiness and increasing resources in the company can increase the expectations of managers and its interaction causes the intensity of asymmetric behavior of information [19]. Tari Verdi et al. stated that investment strategy, company strategy according to future information and management ability will increase the asymmetry of cost behavior and competitive strategies and financing will reduce the asymmetry of cost behavior [24]. Hassanvand stated that the asymmetric behavior of payroll costs at the level of the whole sample and the more symmetrical behavior of this cost is in companies with low profits compared to other companies [15]. Haqiqat and Mortazavi show that in the sales increase periods, the future profits are negatively related with the ratio of operating costs. But contrary to the traditional interpretation in the period of declining sales, increasing the ratio of operating costs increases future operating profit, and the higher the ratio of operating costs to sales, the stronger the positive relationship between operating costs and future operating profit in periods of declining sales. Also, by eliminating the effect of cost behavior, increasing the ratio of operating costs in both periods of increasing sales and periods of decreasing sales will increase future operating profit. Khani et al. stated that agency variables have a significant effect on the asymmetry of administrative, general and sales costs. Therefore, the asymmetry of costs due to the agency issue has a positive relationship with the personal and governmental motivations of managers [19]. Kurdistan and Mortazavi show that the expectation of increased future sales by

management reduces the sales cost stickiness and the more this optimism, the more the decrease of sales cost stickiness. But management optimism increases the behavior of sales, public and administrative costs, and the stickiness of these costs in the case of high management optimism is more than low optimism, which is considered as the strong evidences to support the hypothesis of prudent decisions about sales, public and administrative costs. [21]. Abroad as well, Ali et al. found that the issuance of a forecast is no longer negatively related to future stock returns. These results show that the temporary avoidance of bad news by companies increases the dispersion of forecasts among analysts and leads to future stock returns [2]. Choi et al. show that it is important to consider not only the specific factors of the company but also the impact of a manager when examining cost symmetry. [12,9]. showed that CEO overconfidence and management overconfidence are positively associated with cost stickiness. In addition, they found that the relationship between financial management overconfidence and cost stickiness was greater in companies with more power. Cheung et al. showed that public, sales and administrative costs for companies in different competitive environments, including product differentiation, higher input costs and market size, have more stickiness and asymmetric cost behavior is influenced by internal and external factors [9]. Chen et al. showed that management expectations (financial reporting tone) influence resource allocation decisions [11]. Chen et al. showed that decisions based on managers' expectations can reverse previously documented internal cost stickiness behavior. It should be noted that the impact of management expectations on the degree of asymmetry is stronger when both the initial number of stagnant resources and the magnitude of adjustment costs are high [10]. M Ciftci et al. state that analysts lead to profit forecasting errors and systematic errors relative to the average in identifying cost changes and cost stickiness. Incorrect use of available information on cost behavior in forecasting profits leads to larger errors in unfavorable scenarios than favorable ones [13]. Weiss et al. showed that analysts' forecasts of profits and costs are erroneous. On the other hand, profit forecasting error is higher in case of unfavorable sales forecasting error and they concluded that managers and analysts do not fully consider cost stickiness and accurate cost forecasting has a greater effect on profit forecasting accuracy [26]. Kenji showed that managers' forecast for future costs and therefore profit are optimistic, and when managers expect to increase (decrease) future sales, they predict the increase (decrease) of future costs less (more) than reality and managers pay attention to cost behavior in their predictions; therefore, he attributed management optimism to domestic budget goals [18]. Hutton stated that although analysts are often considered as industry experts, they cannot find evidences that analysts have an information advantage over managers at the industry level [16]. Other findings suggest that cost stickiness has a positive impact on the relationship between institutional investors and passive institutional investors with conservatism [28]. Javaheri and zanjirdar showed that there was a significant relationship between the profit management and companies performance. The profit management is also effective in forecasting future cash fund, in forcing solidarity between running and future yield [29]. The results of another research show that there a reverse (negative) relationship between institutional ownership level, managerial ownership level, and ownership concentration level with liquidity. Also, there is a direct (positive) relationship between corporative ownership level and liquidity [30].

### **3 Research hypotheses**

Hypothesis 1: The effectiveness of managers' information interpretation on the behavior of costs in terms of potential competition is different from de facto competition.

Hypothesis 1-1: The effectiveness of managers' consensus changes about profits on the behavior of costs in terms of potential competition is different from de facto competition.

Hypothesis 1-2: The effectiveness of changes in general profit information on the behavior of costs in terms of potential competition is different from de facto competition.

Hypothesis 1-3: The effectiveness of changes in private profit information on the behavior of costs in terms of potential competition is different from de facto competition.

Hypothesis 1-4: The effectiveness of bias changes in profit forecasting on cost behavior in terms of potential competition is different from de facto competition.

#### 4 Methodology

The present study is in the category of applied researches, in terms of nature is in the category of descriptive researches and in terms of method is in the category of correlational researches. To collect data and information, the library method has been used and in the research data section, referring to financial statements, explanatory notes and stock exchange magazines have been used. Descriptive and inferential statistics have been used to describe and summarize the collected data. In order to analyze the data, first the pre-tests of F-Limer test, Hausman test and Jarque-Bera test and then multivariate regression test were used to confirm and reject the research hypotheses (EViews software).

The statistical population of this study is the companies listed on the Tehran Stock Exchange that participated in the Tehran Stock Exchange during 2014-2020 that using targeted sampling, 120 companies have been selected as a research sample to test statistical hypotheses. The statistical population includes all companies listed on the Tehran Stock Exchange on March 2020. Which has been homogenized according to the conditions of Table 1 and the screened population has been studied.

**Table 1:** Different Stages of Population

|  |               |
|--|---------------|
| Number of companies on the Stock Exchange on March 2020  | 532 companies |
| Number of companies that were not listed on the stock exchange at least in one of the years 2014-2020. | 110 companies |
| Number of companies whose fiscal year does not end at the end of March.                                | 60 companies  |
| Number of companies that have changed their fiscal year in the research period.                        | 37 companies  |
| Investment companies, banks and insurances   | 87 companies  |
| Number of companies that do not have the financial information required for the research period.       | 42 companies  |
| The number of companies of statistical population  | 158 companies |

To determine the sample size in this research, Cochran's formula is used, which is described below:

$$n = \frac{N \times z^2 \cdot \alpha/2 \times \delta^2}{(N-1)\varepsilon^2 + z^2 \cdot \alpha/2 \times \delta^2}$$

$$n = \frac{158 \times 1.96^2 \cdot .5/2 \times .5^2}{(158-1) \cdot 0.05^2 + 1.96^2 \cdot .5 \times .5^2} = 120$$

$n$  = statistical sample,  $N$  = statistical population,  $Z$  = normal variable value corresponding to the desired confidence level for confidence interval of 95% which is equal to 1.96,  $\sigma$  = variance of the population which is considered equal to (0.5).

$\varepsilon$  = The amount of error allowed is equal to (0.05). The statistical sample obtained by Cochran's formula is equal to 120 data. For each variable of this study, 868 data-years have been collected to test statistical hypotheses.

To test the research hypothesis, the relevant sub-hypotheses are used, which the regression models (1) and (2) are related to Hypothesis 1-1:

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0 + (\beta_1 \Delta P_{it-1} + \beta_2 DEC_{it-1} + \beta_3 \Delta P_{it-1} \times COMP_{it} + \beta_4 DEC_{it-1} \times COMP_{it} \\ & + \beta_5 \log STE_{it} + \beta_6 \log STA_{it} + \beta_7 GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8 \Delta P_{it-1} + \beta_9 DEC_{it-1} + \beta_{10} \Delta P_{it-1} \times COMP_{it} \\ & + \beta_{11} DEC_{it-1} \times COMP_{it} + \beta_{12} \log STE_{it} + \beta_{13} \log STA_{it} \\ & + \beta_{14} GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0^* + (\beta_1^* \Delta P_{it-1} + \beta_2^* DEC_{it-1} + \beta_3^* \Delta P_{it-1} \times COMP_{it} + \beta_4^* DEC_{it-1} \times COMP_{it} \\ & + \beta_5^* \log STE_{it} + \beta_6^* \log STA_{it} + \beta_7^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8^* \Delta P_{it-1} + \beta_9^* DEC_{it-1} + \beta_{10}^* \Delta P_{it-1} \times COMP_{it} \\ & + \beta_{11}^* DEC_{it-1} \times COMP_{it} + \beta_{12}^* \log STE_{it} + \beta_{13}^* \log STA_{it} \\ & + \beta_{14}^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (2)$$

$\beta_{10}$ : the effectiveness coefficient of changes in managers' consensus on profits on the cost behaviour in terms of potential competition,

$\beta_{10}^*$ : the effectiveness coefficient of changes in managers' consensus on profits on the cost behaviour in terms of de facto competition.

Regression models (3) and (4) are related to Hypothesis 1-2:

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0 + (\beta_1 \Delta C_{it-1} + \beta_2 DEC_{it-1} + \beta_3 \Delta C_{it-1} \times COMP_{it} + \beta_4 DEC_{it-1} \times COMP_{it} \\ & + \beta_5 \log STE_{it} + \beta_6 \log STA_{it} + \beta_7 GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8 \Delta C_{it-1} + \beta_9 DEC_{it-1} + \beta_{10} \Delta C_{it-1} \times COMP_{it} \\ & + \beta_{11} DEC_{it-1} \times COMP_{it} + \beta_{12} \log STE_{it} + \beta_{13} \log STA_{it} \\ & + \beta_{14} GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (3)$$

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0^* + (\beta_1^* \Delta C_{it-1} + \beta_2^* DEC_{it-1} + \beta_3^* \Delta C_{it-1} \times COMP_{it} + \beta_4^* DEC_{it-1} \times COMP_{it} \\ & + \beta_5^* \log STE_{it} + \beta_6^* \log STA_{it} + \beta_7^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8^* \Delta C_{it-1} + \beta_9^* DEC_{it-1} + \beta_{10}^* \Delta C_{it-1} \times COMP_{it} \\ & + \beta_{11}^* DEC_{it-1} \times COMP_{it} + \beta_{12}^* \log STE_{it} + \beta_{13}^* \log STA_{it} \\ & + \beta_{14}^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (4)$$

$\beta_{10}$ : the effectiveness coefficient of changes in common information on profits on the cost behavior in terms of potential competition,

$\beta_{10}^*$ : the effectiveness coefficient of changes in common information on profits on the cost behavior in terms of de facto competition.

Regression models (5) and (6) are related to Hypothesis 1-3:

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0 + (\beta_1 \Delta P_{it-1} + \beta_2 DEC_{it-1} + \beta_3 \Delta P_{it-1} \times COMP_{it} + \beta_4 DEC_{it-1} \times COMP_{it} \\ & + \beta_5 \log STE_{it} + \beta_6 \log STA_{it} + \beta_7 GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8 \Delta P_{it-1} + \beta_9 DEC_{it-1} + \beta_{10} \Delta P_{it-1} \times COMP_{it} \\ & + \beta_{11} DEC_{it-1} \times COMP_{it} + \beta_{12} \log STE_{it} + \beta_{13} \log STA_{it} \\ & + \beta_{14} GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (5)$$

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0^* + (\beta_1^* \Delta P_{it-1} + \beta_2^* DEC_{it-1} + \beta_3^* \Delta P_{it-1} \times COMP_{it} + \beta_4^* DEC_{it-1} \times COMP_{it} \\ & + \beta_5^* \log STE_{it} + \beta_6^* \log STA_{it} + \beta_7^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8^* \Delta P_{it-1} + \beta_9^* DEC_{it-1} + \beta_{10}^* \Delta P_{it-1} \times COMP_{it} \\ & + \beta_{11}^* DEC_{it-1} \times COMP_{it} + \beta_{12}^* \log STE_{it} + \beta_{13}^* \log STA_{it} \\ & + \beta_{14}^* GDP\ GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \varepsilon \end{aligned} \quad (6)$$

$\beta_{10}$ : the effectiveness coefficient of changes in private information on profits on the cost behavior in terms of potential competition,

$\beta_{10}^*$ : the effectiveness coefficient of changes in private information on profits on the cost behavior in terms of de facto competition.

Regression models (7) and (8) are related to Hypothesis 1-4:

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0 + (\beta_1 \Delta A_{it-1} + \beta_2 DEC_{it-1} + \beta_3 \Delta A_{it-1} \times COMP_{it} + \beta_4 DEC_{it-1} \times COMP_{it} \\ & + \beta_5 \log STE_{it} + \beta_6 \log STA_{it} + \beta_7 GDP\_GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8 \Delta A_{it-1} + \beta_9 DEC_{it-1} + \beta_{10} \Delta A_{it-1} \times COMP_{it} \\ & + \beta_{11} DEC_{it-1} \times COMP_{it} + \beta_{12} \log STE_{it} + \beta_{13} \log STA_{it} \\ & + \beta_{14} GDP\_GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \epsilon \end{aligned} \tag{7}$$

$$\begin{aligned} \Delta \log OC_{it} = & \beta_0^* + (\beta_1^* \Delta A_{it-1} + \beta_2^* DEC_{it-1} + \beta_3^* \Delta A_{it-1} \times COMP_{it} + \beta_4^* DEC_{it-1} \times COMP_{it} \\ & + \beta_5^* \log STE_{it} + \beta_6^* \log STA_{it} + \beta_7^* GDP\_GROWTH_{it}) \Delta \log SALE_{it} \\ & + (\beta_8^* \Delta A_{it-1} + \beta_9^* DEC_{it-1} + \beta_{10}^* \Delta A_{it-1} \times COMP_{it} \\ & + \beta_{11}^* DEC_{it-1} \times COMP_{it} + \beta_{12}^* \log STE_{it} + \beta_{13}^* \log STA_{it} \\ & + \beta_{14}^* GDP\_GROWTH_{it}) \Delta \log SALE_{it} \times DEC_{it} + \epsilon \end{aligned} \tag{8}$$

$\beta_{10}$ : the effectiveness coefficient of bias changes in profit forecast on the cost behavior in terms of potential competition,

$\beta_{10}^*$ : the effectiveness coefficient of bias changes in profit forecast on the cost behavior in terms of de facto competition.

In the mentioned models:

$\Delta \log OC$ : changes in operational costs logarithm;  $Comp$ : potential completion;  $Com$ : de facto completion;  $\Delta P_{it}$ : analysts' consensus changes about profit;  $\Delta C_{it}$ : common information changes;  $\Delta P_{it}$ : private information changes;  $\Delta A_{it}$ : bias changes in profit forecast;  $\Delta \log SALE$ : change in sales income logarithm;  $DEC_{it}$ : sales income decline,  $DEC_{it-1}$ : continuous sales income decline;  $\log STE_{it}$ : per capita sales logarithm;  $\log STA$ : sales to assets ratio logarithm;  $GDP\_GROWTH$ : GDP growth rate; in the following the method of measuring research variables is presented:

A: Change in the operating costs logarithm (cost behavior) where the operating costs (cost of goods sold and general, administrative and sales costs) of year t, minus the logarithm of operating costs of year t-1 are obtained (Kurdistan and Saber, 2018).

A: managers' information interpretation including:

1) Analysts' consensus changes about earning ( $\Delta P_{it}$ ) presented in model (9):

$$p = \frac{SE - D/N}{(1 - 1/N)D + SE} \tag{9}$$

SE: Standard error square of average earnings per share forecast over the period, presented in models (10) and (11):

$$S.E_1 = \frac{\frac{(FP_1 - AP)^2}{|FP_1|} + \frac{(FP_2 - AP)^2}{|FP_2|} + \dots + \frac{(FP_n - AP)^2}{|FP_n|}}{N} \tag{10}$$

$$E_1 = \frac{\sum (FP_{it} - AP)^2}{N} \tag{11}$$

FP<sub>it</sub>: Earnings per share forecast; AP: actual earnings per share on convention date; N: number of predictions; D: Variance of earnings per share forecast over the period; N: number of earning forecast [7]

2) General information changes ( $\Delta C_{it}$ ); presented in model (12):

$$COMMON = \frac{SE-D/N}{[(1-1/N)D+SE]^2} \tag{12}$$

3) Private information changes ( $\Delta P_{it}$ ); presented in model (13):

$$PRIVATE = \frac{D}{[(1-1/N)D+SE]^2} \tag{13}$$

4) Bias changes in profit forecast ( $\Delta A_{it}$ ): researchers divided managers' forecasts of profit bias into two components including forecast growth and forecast error. To calculate the first component, the first forecasted profit of year t minus the actual profit of the previous year is t-1, and the result is divided by the sum of the first assets of the period. To calculate the second component, the difference between the actual profit of year t and the forecasted profit of year t is divided by the sum of the assets at the end of the period. The way of calculating the components of managers' bias in profit forecasting is presented in the following formulas, which are presented in models (14) and (15):

$$FI = (\bar{E}_t - E_{t-1}) \div TA_{t-1} \tag{14}$$

$$FE = (E_t - \bar{E}_t) \div TA_t \tag{15}$$

FI growth forecast; FE: forecast error;  $\bar{E}_t$ : the first forecasted profit of managers for the year; Et-1: real profit of the last year; TAt-1: the total asset at the first of the fiscal year; Et: real net profit of the year t;  $\bar{E}_t$ : forecasted profit of the year t; TAt : total assets at the end of the year t; in this study, the meaning of bias in profit forecasting is management optimism in profit forecasting, therefore, if simultaneously FI index be positive and FE be negative, the management optimism is equal to one otherwise is zero (Barron et al., 2020).

## 5 Findings and data analysis

F-Limer and Hausman test

The results of F-Limer and Hausmann test for research hypotheses are listed in Table 3:

**Table 3:** The Results of F-Limer and Hausmann Test

| result     | Significance level | F-Limer test |           |          |
|------------|--------------------|--------------|-----------|----------|
| integrated | 0.2669             | 1.092467     | potential | H1 model |
| integrated | 0.2587             | 1.096556     | De facto  |          |
| integrated | 0.6831             | 0.926067     | potential | H2 model |
| integrated | 0.4070             | 1.031355     | De facto  |          |
| integrated | 0.6264             | 0.948084     | potential | H3 model |
| integrated | 0.4966             | 0.996816     | De facto  |          |
| integrated | 0.5114             | 0.991239     | Potential | H4 model |
| integrated | 0.3439             | 1.057330     | De facto  |          |

Source: (Researcher Findings)

In Table (3), the panel data method for the research hypotheses model is accepted that the panel data method itself can be done using two models of random effects and fixed effects and to select them, Hausman test is used. According to the research models, the probability of chi-square test is less than 5%, so fixed effects are used to estimate and analyze the model of Hypotheses 1 to 4.

First hypothesis test:

According to the interpreting managers' information indices, in order to comment on this hypothesis,



the following sub-hypotheses are examined and tested:

Hypothesis 1-1 Test:

Hypothesis 1-1: The effectiveness of the managers' information interpretation on the cost behavior in terms of potential competition is different from de facto competition.

The results of Hypothesis 1-1 of the research are described in Table 4:

**Table 4:** Summary of The Results of H1-1 Model:

| Variable                              | Coefficient | Std. Error         | t-Statistic | Prob.    |
|---------------------------------------|-------------|--------------------|-------------|----------|
| C                                     | 0.025309    | 0.001977           | 12.79938    | 0.0000   |
| DP_DLOGSALE                           | -7.913463   | 3.641553           | -2.173101   | 0.0301   |
| DC_DLOGSALE                           | 13.20241    | 6.003284           | 2.199197    | 0.0282   |
| DP_COMP_DLOGSALE                      | -0.073589   | 0.293839           | -0.250442   | 0.8023   |
| DEC_COMP_DLOGSALE                     | 1.924275    | 0.431615           | 4.458317    | 0.0000   |
| LOGSTE_DLOGSALE                       | 0.151434    | 0.003903           | 38.79516    | 0.0000   |
| LOGSTA_DLOGSALE                       | 0.079350    | 0.011675           | 6.796345    | 0.0000   |
| GROWTH_GDP_DLOGSALE                   | 0.265830    | 0.134707           | 1.973397    | 0.0489   |
| DP_DLOGSALE_DEC                       | -10.54873   | 5.804885           | -1.817216   | 0.0696   |
| DC_DLOGSALE_DEC                       | 1.177755    | 9.133505           | 0.128949    | 0.8974   |
| DP_COMP_DLOGSALE_DEC                  | -3.689538   | 1.704162           | -2.165016   | 0.0307   |
| DEC_COMP_DLOGSALE_DEC                 | 3.117906    | 1.437424           | 2.169092    | 0.0304   |
| LOGSTE_DLOGSALE_DEC                   | 0.003311    | 0.018496           | 0.179013    | 0.8580   |
| LOGSTA_DLOGSALE_DEC                   | 0.491718    | 0.080083           | 6.140078    | 0.0000   |
| GROWTH_GDP_DLOGSALE_DEC               | 1.207350    | 0.359320           | 3.360101    | 0.0008   |
| Effects Specification                 |             |                    |             |          |
| Cross-section fixed (dummy variables) |             |                    |             |          |
| Weighted Statistics                   |             |                    |             |          |
| R-squared                             | 0.838067    | Mean dependent var |             | 0.120712 |
| Adjusted R-squared                    | 0.807305    | S.D. dependent var |             | 0.205773 |
| S.E. of regression                    | 0.052832    | Sum squared resid  |             | 1.836603 |
| F-statistic                           | 76.62432    | Durbin-Watson stat |             | 2.302986 |
| Prob(F-statistic)                     | 0.000000    |                    |             |          |

Source: (Researchers' Findings)

In Table 4, the probability of t-statistic for changes in analysts' consensus on profits in the interaction of change in the sales revenue logarithm in terms of potential competition condition, consecutive decrease in sales revenue in the interaction of change in the sales revenue logarithm in conditions of potential competition, sales per capita logarithm in the interaction of change in the logarithm of sales revenue, the sales to assets ratio logarithm in the interaction of change in the logarithm of sales, GDP growth rate in the interaction of change in the logarithm of sales revenue, changes in analysts' consensus on profits in the interaction of changes in the logarithm of sales revenue and declining sales revenue, changes in managers' consensus on profit on cost behavior in terms of potential competition condition, sales-to-assets ratio logarithm in the interaction of change in sales revenue logarithm and decrease in sales revenue, and GDP growth rate in interaction of change in sales revenue logarithm and sales revenue decrease on cost behavior in terms of potential competition is less than 5%; therefore, the above relationship is statistically significant. The coefficient of changes of profit managers' consensus on the cost behavior in terms of potential competition condition on the cost behavior in terms of potential competition condition is equal to -10.167. The adjusted determination coefficient shows the explanatory power of the independent variables, which is able to explain 80% of the changes in the dependent variable. The probability of F statistic indicates that the whole model is statistically significant. The value

of the Durbin-Watson is 2.30, which is in the range of 1.5 to 2.5, so the independence of the model residues is confirmed. The following examination of Hypothesis 1-1 is presented in Table 5.

**Table 5:** Summary of The Results of H1-1 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.    |
|-------------------------|-------------|--------------------|-------------|----------|
| C                       | 0.025578    | 0.002139           | 11.95619    | 0.0000   |
| DP_DLOGSALE             | -8.709743   | 4.297469           | -2.026714   | 0.0431   |
| DC_DLOGSALE             | -27.34541   | 6.646283           | -4.114391   | 0.0000   |
| DP_COM_DLOGSALE         | 0.053051    | 0.118892           | 0.446209    | 0.6556   |
| DEC_COM_DLOGSALE        | 0.237580    | 0.140971           | 1.685315    | 0.0924   |
| LOGSTE_DLOGSALE         | 0.149970    | 0.004409           | 34.01107    | 0.0000   |
| LOGSTA_DLOGSALE         | 0.074297    | 0.013534           | 5.489795    | 0.0000   |
| GROWTH_GDP_DLOGSALE     | -0.079782   | 0.141952           | -0.562039   | 0.5743   |
| DP_DLOGSALE_DEC         | 21.88135    | 4.990856           | 4.384289    | 0.0000   |
| DC_DLOGSALE_DEC         | 25.48403    | 7.967349           | 3.198559    | 0.0014   |
| DP_COM_DLOGSALE_DEC     | -0.832998   | 0.391486           | -2.127784   | 0.0337   |
| DEC_COM_DLOGSALE_DEC    | -1.017171   | 0.343875           | -2.957966   | 0.0032   |
| LOGSTE_DLOGSALE_DEC     | 0.051196    | 0.017860           | 2.866548    | 0.0043   |
| LOGSTA_DLOGSALE_DEC     | 0.658807    | 0.083069           | 7.930865    | 0.0000   |
| GROWTH_GDP_DLOGSALE_DEC | 0.868141    | 0.400284           | 2.168814    | 0.0305   |
| Weighted Statistics     |             |                    |             |          |
| R-squared               | 0.826188    | Mean dependent var |             | 0.119305 |
| Adjusted R-squared      | 0.793169    | S.D. dependent var |             | 0.194390 |
| S.E. of regression      | 0.054496    | Sum squared resid  |             | 1.954112 |
| F-statistic             | 66.44327    | Durbin-Watson stat |             | 2.337982 |
| Prob(F-statistic)       | 0.000000    |                    |             |          |

Source: Researcher's Findings

In Table 5, the probability of t-statistic for consecutive decrease in sales revenue in the interaction of change in the sales revenue logarithm in terms of de facto competition condition, sales per capita logarithm in the interaction of change in the sales revenue logarithm, the sales to assets ratio logarithm in the interaction of change in the logarithm of sales, GDP growth rate in the interaction of change in the logarithm of sales revenue, changes in managers' consensus on profits in the interaction of changes in the logarithm of sales revenue and declining sales revenue, changes in managers' consensus on profit on cost behavior in terms of de facto competition condition, consecutive decrease in sales revenue in interaction of changes in the logarithm of sales revenue and sales revenue decline in de facto condition, sales-to-assets ratio logarithm in the interaction of change in sales revenue logarithm and decrease in sales revenue, and GDP growth rate in interaction of change in sales revenue logarithm and sales revenue decrease on cost behavior in terms of de facto competition is less than 5%; therefore, the above relationship is statistically significant. According to the hypothesis, since the variable of managers' consensus about profit on the cost behavior in the de facto competition conditions on the cost behavior in the de facto competition conditions is equal to -2.20 and the variable of changes in managers' consensus about profit on the behavior of costs in terms of potential competition on costs behavior in terms of potential competition is equal to -2.12, so the coefficient of effectiveness of changes in managers' consensus about profits on costs behavior in terms of potential competition is not equal to changes in managers' consensus on profits on behavior costs in the de facto competition conditions. The null hypothesis is therefore rejected, meaning that the effectiveness of managers' consensus on profit on cost behavior under potential competition conditions is different from de facto competition.

H1-2 test:

Hypothesis 1-2: The effectiveness of changes in general profit information on the behavior of costs in

terms of potential competition is different from de facto competition. The results of H1-2 of the research are presented in Table 6:

**Table 6:** The Summary of the Results of H1-2 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.    |
|-------------------------|-------------|--------------------|-------------|----------|
| C                       | 0.023833    | 0.002083           | 11.44365    | 0.0000   |
| DC_DLOGSALE             | -2.783345   | 6.370240           | -0.436929   | 0.6623   |
| DEC1_DLOGSALE           | 0.047738    | 0.029195           | 1.635130    | 0.1025   |
| DC_COMP_DLOGSALE        | 22.31840    | 41.91224           | 0.532503    | 0.5946   |
| DEC_COMP_DLOGSALE       | -2.335992   | 0.699308           | -3.340433   | 0.0009   |
| LOGSTE_DLOGSALE         | 0.153176    | 0.003860           | 39.68703    | 0.0000   |
| LOGSTA_DLOGSALE         | 0.076109    | 0.011865           | 6.414695    | 0.0000   |
| GROWTH_GDP_DLOGSALE     | -0.412836   | 0.146164           | -2.824472   | 0.0049   |
| DC_DLOGSALE_DEC         | 39.71882    | 9.901363           | 4.011450    | 0.0001   |
| DEC_DLOGSALE_DEC        | -0.049652   | 0.074442           | -0.666983   | 0.5050   |
| DC_COMP_DLOGSALE_DEC    | -20.99969   | 5.773893           | -3.637007   | 0.0003   |
| DEC_COMP_DLOGSALE_DEC   | 3.006498    | 2.026728           | 1.483424    | 0.1384   |
| LOGSTE_DLOGSALE_DEC     | -0.001030   | 0.022024           | -0.046766   | 0.9627   |
| LOGSTA_DLOGSALE_DEC     | -0.443547   | 0.084694           | -5.237040   | 0.0000   |
| GROWTH_GDP_DLOGSALE_DEC | 1.164709    | 0.518996           | 2.244158    | 0.0252   |
| Weighted Statistics     |             |                    |             |          |
| R-squared               | 0.836046    | Mean dependent var |             | 0.120726 |
| Adjusted R-squared      | 0.804900    | S.D. dependent var |             | 0.205104 |
| S.E. of regression      | 0.052748    | Sum squared resid  |             | 1.830788 |
| F-statistic             | 75.25867    | Durbin-Watson stat |             | 2.299759 |
| Prob(F-statistic)       | 0.000000    |                    |             |          |

Source: researchers' findings

In Table 6, the probability of t-statistic for changes in general information in the interaction of changes in the logarithm of sales revenue, consecutive decrease in sales revenue in the interaction of change in the sales revenue logarithm in terms of potential competition condition, sales per capita logarithm in the interaction of change in the sales revenue logarithm, the sales to assets ratio logarithm in the interaction of change in the logarithm of sales, GDP growth rate in the interaction of change in the logarithm of sales revenue, consecutive decrease in sales revenue in interaction of changes in the logarithm of sales revenue and sales revenue decline, general information changes on profit on cost behavior in de facto condition, sales-to-assets ratio logarithm in the interaction of change in sales revenue logarithm and decrease in sales revenue on the behavior of costs in the potential competition conditions is less than 5%; therefore, the above relationship is statistically significant. The general information coefficient changes about profit on cost behavior in terms of potential competition on cost behavior in terms of potential competition is -3.60 and the probability of t-statistic for the coefficient of variables of successive decrease in sales revenue in the interaction of change in sales revenue logarithm, changes in general information in the interaction of changes in the logarithm of sales revenue in terms of potential competition, changes in general information in the interaction of changes in the logarithm of sales revenue and decrease in sales, consecutive decrease in sales revenue in the interaction of changes in the logarithm of sales revenue and decrease in sales revenue in terms of potential competition and the sales per capita logarithm in the interaction of the change in the sales revenue logarithm and the decrease in sales revenue on the cost behavior in terms of potential competition is more than 5%; Therefore, the above relationship is not statistically significant. Therefore, with 95% confidence, this variable is non-significant in the model. A further review of Hypothesis 2-1 is presented in Table 7.

**Table 7:** The Summary of the Results of H2-1 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.  |
|-------------------------|-------------|--------------------|-------------|--------|
| C                       | 0.026521    | 0.002228           | 11.90497    | 0.0000 |
| DC_DLOGSALE             | -12.42366   | 1.478612           | -8.402247   | 0.0000 |
| DEC1_DLOGSALE           | -0.039766   | 0.026523           | -1.499310   | 0.1343 |
| DC_COM_DLOGSALE         | 10.74338    | 19.05625           | 0.563772    | 0.5731 |
| DEC_COM_DLOGSALE        | 0.014280    | 0.151515           | 0.094247    | 0.9249 |
| LOGSTE_DLOGSALE         | 0.148274    | 0.004648           | 31.89929    | 0.0000 |
| LOGSTA_DLOGSALE         | 0.082277    | 0.013242           | 6.213279    | 0.0000 |
| GROWTH_GDP_DLOGSALE     | -0.075193   | 0.144143           | -0.521653   | 0.6021 |
| DC_DLOGSALE_DEC         | 1.656804    | 3.164841           | 0.523503    | 0.6008 |
| DEC_DLOGSALE_DEC        | 0.267105    | 0.053302           | 5.011172    | 0.0000 |
| DC_COM_DLOGSALE_DEC     | -0.577150   | 0.261735           | -2.205095   | 0.0278 |
| DEC_COM_DLOGSALE_DEC    | -1.448229   | 0.356777           | -4.059200   | 0.0001 |
| LOGSTE_DLOGSALE_DEC     | -0.022091   | 0.022601           | -0.977411   | 0.3287 |
| LOGSTA_DLOGSALE_DEC     | -0.432859   | 0.088783           | -4.875458   | 0.0000 |
| GROWTH_GDP_DLOGSALE_DEC | 0.249955    | 0.389504           | 0.641727    | 0.5213 |
| Weighted Statistics     |             |                    |             |        |
| R-squared               | 0.831248    | Mean dependent var | 0.118682    |        |
| Adjusted R-squared      | 0.799190    | S.D. dependent var | 0.194090    |        |
| S.E. of regression      | 0.053286    | Sum squared resid  | 1.868293    |        |
| F-statistic             | 70.20785    | Durbin-Watson stat | 2.317205    |        |
| Prob(F-statistic)       | 0.000000    |                    |             |        |

Source: Researchers' Findings

In Table 7, the probability of t-statistic consecutive decrease in sales revenue in the interaction of changes in the logarithm of sales revenue, sales per capita logarithm in the interaction of change in the sales revenue logarithm, the sales to assets ratio logarithm in the interaction of change in the logarithm of sales, GDP growth rate in the interaction of change in the logarithm of sales revenue, changes in general information about profits on the behavior of costs in terms of de facto competition condition, the sales to assets ratio logarithm in the interaction of changes in the logarithm of sales revenue and declining sales revenue and GDP growth rate in the interaction of changes in the logarithm of sales revenue and declining sales revenue on cost behavior in terms of de facto competition condition is less than 5%; therefore, the above relationship is statistically significant. According to the hypothesis, since general information coefficient changes about profit on cost behavior in terms of de facto competition on cost behavior in terms of potential competition is -3.60 and changes in general information about profits to cost behavior in terms of potential competition on cost behavior in terms of potential competition is -2.20. Therefore, the effectiveness coefficient of changes in general profit information on the behavior of costs in the conditions of potential competition is not equal to the changes of general information of profits in the behavior of costs in the conditions of de facto competition. So the Null hypothesis is rejected; That is, the effectiveness of changes in general earning information changes the behavior of costs under potential competitive conditions is different from de facto competition conditions.

H3-1 test:

Hypothesis 3-1: The effect of changes in private earnings information on the behavior of costs in terms of potential competition is different from de facto competition.

The results of Hypothesis 3-1 of the research are as described in Table 8:

**Table 8:** Summary of The Results of the Hypothesis 1-3 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.  |
|-------------------------|-------------|--------------------|-------------|--------|
| C                       | 0.023579    | 0.001962           | 12.01531    | 0.0000 |
| DPIT1_DLOGSALE          | -0.009178   | 0.018509           | -0.495879   | 0.6201 |
| DEC1_DLOGSALE           | 0.043235    | 0.027223           | 1.588187    | 0.1127 |
| DP_COMP_DLOGSALE01      | -2.861330   | 18.64472           | -0.153466   | 0.8781 |
| DEC_COMP_DLOGSALE       | 2.222964    | 0.621922           | 3.574345    | 0.0004 |
| LOGSTE_DLOGSALE         | 0.153398    | 0.003645           | 42.08235    | 0.0000 |
| LOGSTA_DLOGSALE         | 0.079792    | 0.010933           | 7.298454    | 0.0000 |
| GROWTH_GDP_DLOGSALE     | -0.511278   | 0.141295           | -3.618521   | 0.0003 |
| DP_LOGSALE_DEC          | 0.015750    | 0.077422           | 0.203427    | 0.8389 |
| DEC_DLOGSALE_DEC        | 0.024538    | 0.068792           | 0.356693    | 0.7214 |
| DP_COMP_DLOGSALE_DEC01  | -13.20762   | 2.631146           | -5.019722   | 0.0000 |
| DEC_COMP_LOGSALE_DEC    | 3.347262    | 1.816421           | 1.842779    | 0.0658 |
| LOGSTE_DLOGSALE_DEC     | 0.011831    | 0.020413           | 0.579593    | 0.5624 |
| LOGSTA_DLOGSALE_DEC     | 0.471115    | 0.078331           | 6.014404    | 0.0000 |
| GROWTH_GDP_DLOGSALE_DEC | -1.236507   | 0.456964           | -2.705916   | 0.0070 |
| Weighted Statistics     |             |                    |             |        |
| R-squared               | 0.853083    | Mean dependent var | 0.118513    |        |
| Adjusted R-squared      | 0.825173    | S.D. dependent var | 0.218295    |        |
| S.E. of regression      | 0.050669    | Sum squared resid  | 1.689297    |        |
| F-statistic             | 85.95540    | Durbin-Watson stat | 2.301974    |        |
| Prob(F-statistic)       | 0.000000    |                    |             |        |

Source: Researcher's Findings

In Table 8, the probability of t-statistics of changes in private information in the interaction of change in the logarithm of sales revenue in terms of potential competition, consecutive decrease in sales revenue in the interaction of change in the logarithm of sales revenue in terms of potential competition, sales per capita logarithm in interaction of change in the logarithm of sales revenue, sales to assets ratio logarithm in the interaction of change in sales revenue logarithm, GDP growth rate in interaction of change in sales revenue logarithm, changes in private information on cost behavior in terms of potential competition, logarithm of sales to assets ratio in interaction of change in logarithm Sales revenue and decrease in sales revenue and GDP growth rate in the interaction of changes in the logarithm of sales revenue and decrease in sales revenue on cost behavior in terms of potential competition is less than 5%; Therefore, the above relationship is statistically significant. The coefficient of variation of private information on the behavior of costs in the conditions of potential competition on the behavior of costs in the conditions of potential competition is equal to -5.015. The t-statistical probability of changes in private profit information in the interaction of changes in the sales revenue logarithm, consecutive decrease in sales revenue in the interaction of changes in the sales revenue logarithm, changes in private information in the interaction of changes in the sales revenue logarithm and decrease in sales revenue, consecutive decrease in sales revenue in the change interaction of sales revenue logarithm and decrease of sales revenue, consecutive decrease of sales revenue in the interaction of change in the logarithm of sales revenue and decrease of sales revenue in terms of potential competition and sales per capita logarithm in the interaction of change in the logarithm of sales revenue and decrease of sales revenue in potential completion conditions is more than 5%; Therefore, the above relationship is not statistically significant, so with 95% confidence that this variable is non-significant in the model, the continuation of the hypothesis 3-1 is presented in Table 9:

**Table 9:** The Summary of the Results of H3-1 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.    |
|-------------------------|-------------|--------------------|-------------|----------|
| C                       | 0.025596    | 0.002326           | 11.00280    | 0.0000   |
| DPIT1_DLOGSALE          | 0.007710    | 0.022992           | 0.335327    | 0.7375   |
| DEC1_DLOGSALE           | -0.069325   | 0.027718           | -2.501109   | 0.0126   |
| DP_COM_DLOGSALE01       | 5.751723    | 9.289048           | 0.619194    | 0.5360   |
| DEC_COM_DLOGSALE        | 0.062166    | 0.159918           | 0.388739    | 0.6976   |
| LOGSTE_DLOGSALE         | 0.147694    | 0.004850           | 30.45391    | 0.0000   |
| LOGSTA_DLOGSALE         | 0.088401    | 0.012517           | 7.062344    | 0.0000   |
| GROWTH_GDP_DLOGSALE     | -0.162004   | 0.157853           | -1.026294   | 0.3051   |
| DP_LOGSALE_DEC          | -0.175342   | 0.075292           | -2.328821   | 0.0202   |
| DEC_DLOGSALE_DEC        | 0.154384    | 0.075227           | 2.052241    | 0.0405   |
| DP_COM_DLOGSALE_DEC01   | -4.336862   | 2.132474           | -2.033723   | 0.0424   |
| DEC_COM_LOGSALE_DEC     | 1.082382    | 0.414944           | 2.608501    | 0.0093   |
| LOGSTE_DLOGSALE_DEC     | -0.018771   | 0.024044           | -0.780700   | 0.4353   |
| LOGSTA_DLOGSALE_DEC     | -0.395562   | 0.087690           | -4.510889   | 0.0000   |
| GROWTH_GDP_DLOGSALE_DEC | 0.089974    | 0.438127           | 0.205361    | 0.8374   |
| Weighted Statistics     |             |                    |             |          |
| R-squared               | 0.833445    | Mean dependent var |             | 0.117045 |
| Adjusted R-squared      | 0.801804    | S.D. dependent var |             | 0.181722 |
| S.E. of regression      | 0.053240    | Sum squared resid  |             | 1.865131 |
| F-statistic             | 60.26780    | Durbin-Watson stat |             | 2.319991 |
| Prob(F-statistic)       | 0.000000    |                    |             |          |

Source: Researcher's Findings

Table 9, Statistical probability t of consecutive decrease in sales revenue in the interaction of change in sales revenue logarithm, sales per capita logarithm in interaction of change in sales revenue logarithm, sales to asset ratio logarithm in change in sales revenue logarithm, GDP growth rate in interaction of change in sales revenue logarithm, consecutive decrease of sales revenue in interaction of change in logarithm of sales revenue and decrease of sales revenue, changes of private information on cost behavior in conditions of de facto competition, sales to assets ratio logarithm in interaction of change in logarithm of sales revenue and decrease Sales revenue and GDP growth rate in the interaction of changes in the logarithm of sales revenue and reduction of sales revenue on the behavior of costs in conditions of de facto competition is less than 5%; Therefore, the above relationship is statistically significant. According to the hypothesis, since the variable of changes in private profit information on the behavior of costs in the conditions of actual competition on the behavior of costs in the conditions of actual competition is -2.03 and the variable of changes in private information of profit on the behavior of costs in terms of potential competition On the behavior of costs in terms of potential competition is equal to -5/015. Therefore, the effect of changes in earnings private information on cost behavior in terms of potential competition is not equal to changes in earnings private information changes in cost behavior in actual competition. So the Null hypothesis is rejected. That is, the effectiveness of private profit information changes on the behavior of costs in terms of potential competition is different from de facto competition.

Hypothesis 4-1 Test:

Hypothesis 4-1: The effectiveness of bias changes in profit forecasting on cost behavior in terms of potential competition is different from de facto competition.

The results of Hypothesis 4-1 of the research are presented in Table 10:

**Table 10:** The Summary of the Results of H4-1 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.  |
|-------------------------|-------------|--------------------|-------------|--------|
| C                       | 0.024370    | 0.002049           | 11.89486    | 0.0000 |
| DA_DLOGSALEIT           | 7.723167    | 5.190443           | 1.487959    | 0.1372 |
| DEC1_DLOGSALE           | -0.055753   | 0.026376           | -2.113744   | 0.0349 |
| DA_COMP_DLOGSALE        | 43.00859    | 55.85399           | 0.770018    | 0.4416 |
| DEC_COMP_DLOGSALE       | -2.578602   | 0.507223           | -5.083763   | 0.0000 |
| LOGSTE_DLOGSALE         | 0.149117    | 0.004068           | 36.65885    | 0.0000 |
| LOGSTA_DLOGSALE         | 0.078014    | 0.011306           | 6.899949    | 0.0000 |
| GROWTH_GDP_DLOGSALE     | -0.503403   | 0.144535           | -3.482919   | 0.0005 |
| DA_LOGSALE_DEC          | -13.89142   | 20.09424           | -0.691313   | 0.4896 |
| DEC_DLOGSALE_DEC        | 0.019938    | 0.079219           | 0.251685    | 0.8014 |
| DA_COMP_DLOGSALE_DEC    | -9.003071   | 4.449403           | -2.023433   | 0.0434 |
| DEC_COMP_LOGSALE_DEC    | 5.448289    | 2.162006           | 2.520016    | 0.0120 |
| LOGSTE_DLOGSALE_DEC     | -0.010231   | 0.022643           | -0.451839   | 0.6515 |
| LOGSTA_DLOGSALE_DEC     | -0.401873   | 0.085120           | -4.721248   | 0.0000 |
| GROWTH_GDP_DLOGSALE_DEC | 1.495582    | 0.544594           | 2.746234    | 0.0062 |
| Weighted Statistics     |             |                    |             |        |
| R-squared               | 0.838250    | Mean dependent var | 0.122097    |        |
| Adjusted R-squared      | 0.807522    | S.D. dependent var | 0.210651    |        |
| S.E. of regression      | 0.052225    | Sum squared resid  | 1.794650    |        |
| F-statistic             | 76.71338    | Durbin-Watson stat | 2.302406    |        |
| Prob(F-statistic)       | 0.000000    |                    |             |        |

Source: Researcher's Findings

In Table (10), the probability t-statistic of consecutive decrease in sales revenue in the interaction of change in the logarithm of sales revenue in terms of potential competition, sales per capita logarithm in the interaction of change in the logarithm of sales revenue, the sales-to-assets ratio logarithm in the interaction of changes in the sales revenue logarithm, GDP growth rate in the interaction of changes in the sales revenue logarithm, changes in profit forecast bias in the interaction of changes in sales revenue logarithm and sales revenue decline, changes in profit forecast bias on cost behavior in the face of potential competition, consecutive sales revenue decline in the interaction of change in the sales revenue logarithm and decrease in sales revenue in terms of potential competition, the sales to assets ratio logarithm in the interaction of change in the sales revenue logarithm and decrease in sales revenue and GDP growth rate in the interaction of change in the logarithm of sales revenue and decrease in sales revenue on cost behavior in terms of potential competition is less than 5%; Therefore, the above relationship is statistically significant. The coefficient of variation of bias in profit forecasting on the behavior of costs in terms of potential competition is equal to -2.02. Probability of t-statistic for the coefficient of variables of bias changes in profit forecast in the interaction of change in sales revenue logarithm, consecutive decrease in sales revenue in interaction of change in sales revenue logarithm, changes in profit forecast bias in interaction change in sales revenue logarithm in terms of potential competition, consecutive decrease in sales revenue in the interaction of change in sales revenue logarithm and decrease in sales revenue and sales per capita logarithm in the interaction of change in sales revenue logarithm and decrease in sales revenue on cost behavior in terms of potential competition is more than 5%; Therefore, the above relationship is not statistically significant. Therefore, with 95% confidence, this variable is non-significant in the model. The remain of examining H4-1 is presented in Table 11.

**Table 11:** The Summary of the Results of H4-1 Model

| Variable                | Coefficient | Std. Error         | t-Statistic | Prob.    |
|-------------------------|-------------|--------------------|-------------|----------|
| C                       | 0.025673    | 0.002303           | 11.14763    | 0.0000   |
| DA_DLOGSALEIT           | 14.10050    | 4.173015           | 3.378972    | 0.0008   |
| DEC1_DLOGSALE           | -0.062065   | 0.026331           | -2.357105   | 0.0187   |
| DA_COM_DLOGSALE         | 93.43593    | 49.94504           | 1.870775    | 0.0618   |
| DEC_COM_DLOGSALE        | -0.071168   | 0.148606           | -0.478906   | 0.6322   |
| LOGSTE_DLOGSALE         | 0.144483    | 0.004983           | 28.99251    | 0.0000   |
| LOGSTA_DLOGSALE         | 0.089075    | 0.012356           | 7.209101    | 0.0000   |
| GROWTH_GDP_DLOGSALE     | -0.178968   | 0.151335           | -1.182593   | 0.2374   |
| DA_LOGSALE_DEC          | -14.04532   | 16.38767           | -0.857066   | 0.3917   |
| DEC_DLOGSALE_DEC        | 0.134028    | 0.076126           | 1.760615    | 0.0788   |
| DA_COM_DLOGSALE_DEC     | -9.919398   | 4.143708           | -2.393846   | 0.0170   |
| DEC_COM_LOGSALE_DEC     | 0.904737    | 0.412331           | 2.194199    | 0.0286   |
| LOGSTE_DLOGSALE_DEC     | -0.006372   | 0.024560           | -0.259462   | 0.7954   |
| LOGSTA_DLOGSALE_DEC     | -0.411712   | 0.087014           | -4.731574   | 0.0000   |
| GROWTH_GDP_DLOGSALE_DEC | 0.225899    | 0.497893           | 0.453710    | 0.6502   |
| Weighted Statistics     |             |                    |             |          |
| R-squared               | 0.832899    | Mean dependent var |             | 0.119044 |
| Adjusted R-squared      | 0.801155    | S.D. dependent var |             | 0.185219 |
| S.E. of regression      | 0.053035    | Sum squared resid  |             | 1.850776 |
| F-statistic             | 61.09771    | Durbin-Watson stat |             | 2.320320 |
| Prob(F-statistic)       | 0.000000    |                    |             |          |

Source: Researcher's Findings

In Table (11), the probability of t-statistic for the coefficients of variables of consecutive decrease in sales revenue in the interaction of change in sales revenue logarithm, sales per capita logarithm in interaction of change in sales revenue logarithm, sales to asset ratio logarithm in interaction change in sales revenue logarithm, GDP growth rate in the interaction of change in the logarithm of sales revenue, consecutive decrease in sales revenue in the interaction of change in the sales revenue logarithm and decrease in sales revenue, changes in bias information in forecasting profits on cost behavior in conditions of de facto competition, consecutive decrease in sales revenue in interaction changes in sales revenue logarithm and decrease in sales revenue in terms of de facto competition, sales to asset ratio logarithm in interaction changes in sales revenue logarithm and decrease in sales revenue and GDP growth rate in interaction changes in sales revenue logarithm and decrease in sales revenue on cost behavior is less than 5% in terms of de facto competition; Therefore, the above relationship is statistically significant. And the coefficient estimated by the software for the variable of bias information changes in predicting profit on the behavior of costs in the conditions of de facto competition on the behavior of costs in the de facto competition conditions is -2.39. According to the hypothesis, since the variable of bias information changes in profit forecasting on cost behavior in terms of de facto competition on cost behavior in terms of de facto competition is -2.39 and the variable of bias changes in profit forecast on cost behavior in terms of potential competition on the behavior of costs in terms of potential competition is equal to -2.02 Therefore, the effectiveness coefficient of bias changes in profit forecasting on cost behavior in the potential competition conditions is not equal to the bias changes in profit forecast on cost behavior in the de facto competition conditions. So the Null hypothesis is rejected. That is, the effectiveness of bias changes in profit forecasting on the behavior of costs in the potential competition conditions is different from de facto competition conditions.



## 6 Discussion and conclusions

The present study seeks to investigate the role of managers' information interpretation on cost behavior and finally according to the main hypothesis, the managers' information interpretation factors including changes in managers' consensus about profits; Changes in profit general information, changes in profit private information and changes in bias in profit forecasting have a significant effect on cost behavior in terms of potential and de facto competition conditions and according to the significant coefficients of the managers' information interpretation variable, the existence of a significant relationship between the managers' information interpretation and the cost behavior in terms of potential and de facto competition conditions of the company is inferred. Behavioral financial researches have shown that the characteristics of individuals are very important and must be taken into account. This field of literature focuses on the degree of effectiveness of senior managers' interpretations, in accordance with agency theory. This theory states that the separation of ownership and control in a company leads to a conflict of interests between the parties of the contract. Managers are motivated to act in the interests of owners to reduce supervision costs; Therefore, the interpretation of information by management in financial reporting seems to affect the cost behavior. In this regard, Kama and Weiss showed that by increasing the motivation of managers to avoid losses and reduce profitability or achieve the forecasted profit, the asymmetry in cost behavior decreases, which is consistent with the results of the present study, according to the first sub-hypothesis, changes in managers' consensus about profit have a significant effect on cost behavior in potential and de facto competition conditions [17]. Behavioral financial literature focuses on the degree of effectiveness and influence of senior managers, who believe that personal executive characteristics influence corporate decisions. Based on previous researches such as (Anderson et al., 2003; Weiss, 2010; Chen et al., 2012), cost stickiness is associated with managers' optimism in predicting earnings per share, which in some ways is consistent the results of the present study. According to the second sub-hypothesis, changes in general profit information have a significant effect on cost behavior in potential and de facto competition conditions, and according to the significant coefficients of changes in general profit information variable, the existence of significant relationship between changes in general profit information and cost behavior in the company's potential and de facto competition conditions is inferred. By considering information and cost processing, financial analysts follow the logic of the outcome by evaluating reported sales, public, and administrative costs in relation to predetermined baseline points and how financial decision makers set target levels is a central issue in performance feedback theory. According to the third sub-hypothesis, changes in private profit information on cost behavior have a significant effect on potential and de facto competition conditions. The expectation of increased sales in the future by management will reduce the cost stickiness of sales, and the more optimistic this is, the more the cost stickiness of sales will decrease. However, management optimism increases the stickiness of sales, general and administrative costs, and the stickiness of these costs in the case of high management optimism, is more than low optimism, which is strong evidence to support the hypothesis of prudent decisions about sales, public and administrative costs. In this regard, Weiss et al. (2014) argued that in the absence of cost forecasting error, profit forecasting error will be equal in two cases of equally favorable and unfavorable sales forecasting error, and profit and cost forecasting by analysts are associated with error. On the other hand, the profit forecast error is higher when the unfavorable sales forecast error is made and they concluded that managers and analysts do not fully consider cost stickiness, which is somewhat in line with the results of the present study. According to the fourth sub-hypothesis, changes in bias in profit forecasting have a significant effect on cost behavior in the potential and de facto competition conditions. These results emphasize the effect

of economic factors on cost stickiness; economic reason assumes that when the level of sales decreases, managers make a trade-off between their expectations of future demand and the level of adjustment of costs to decide whether to reduce or maintain cost resources. This is also called as balance; therefore, these results can be justified in the direction of deliberate or conscious decision theory. In this regard, Kenji showed that when managers expect future sales to increase (decrease), they predict increase (decrease) of the future period costs less (more) than the real [18]. On the other hand, his results showed that managers pay attention to cost behavior in their forecasts; Therefore, he attributed management optimism to the goals of the domestic budget; Kurdistan and Mortazavi also believe that the expectation of increased sales in the future by management will reduce the sales cost stickiness and the higher this optimism, the cost stickiness will decrease. But, management optimism increases the stickiness of sales, public and administrative costs, and the stickiness of these costs in the case of high management optimism, is more than low optimism, which is strong evidence to support the hypothesis of prudent decisions about sales, general and administrative costs, which is in line with the results of the present study [20]. Also, according to the results of the main hypothesis, an in-depth understanding of managers' information interpretation is critical to predicting and analyzing cost behavior, and investors are suggested to use the present research model to predict the degree of cost stickiness. Managers of companies can also identify and control the effects of cost stickiness and reduce the amount of adjustments needed to reduce the level of their operating assets during periods of declining demand and sales levels and reduce cost stickiness by appropriate contracts for the lease of fixed assets and hiring employees; also, managers can provide more reasonable estimates in years when sales are expected to decline further, taking into account cost stickiness in budgeting. According to the first sub-hypothesis, it is suggested that investors and shareholders use the results of the present study as a basis for their decisions and optimize their decisions on this basis and given the nature of tradable securities in the Tehran Stock Exchange, consider changes in managers' consensus on profits to predict the behavior of the company's sales, general and administrative costs in this market. According to the second sub-hypothesis, managers, with proper planning in relation to the factors affecting cost stickiness, can create the necessary flexibility to reduce capacity during periods of declining demand and sales levels, thereby reducing the severity of cost stickiness. According to the third sub-hypothesis, it is suggested to market policymakers that by increasing the market's ability to properly pricing the sales, general and administrative costs, help improve the level of market information efficiency and better reflect the information published in the price and improve the level of information symmetry between buyers and sellers through increasing the level of competition. Based on the fourth sub-hypothesis, the results can be used by various users, especially managers, financial analysts and auditors for their evaluations and decisions. In addition, the higher the training and insight of company managers, the more likely the formation of cost stickiness, therefore, it is suggested that the Tehran Stock Exchange provide the necessary training through the media, holding training classes, congresses, international conferences, publication of newspapers or monthly magazines related to the analysis and recognition of companies' shares, creation of information websites and blogs by reducing the difference in information level and investors' awareness avoid cost stickiness in companies listed on the Tehran Stock Exchange and huge losses of inexperienced investors, both institutional and non-institutional.

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