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Ferdowsi University of Mashhad

Iranian Journal of Accounting, Auditing & Finance (IJAAF)

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- *Introduction* Some paragraphs contain explaining the problem, literature review, object (purpose), importance and necessity of it.
- *Literature review* a review of the literature investigates only related researches chronologically and the results exploit at the end of the section theory matrix or conceptual model that document research variables and Formulate research hypotheses.
- *Methodology* including Methods, data collection tools, population, sample size and sampling methods, analysis and model testing hypothesis, definition of study variables and operational definition of them can be in presented the same section that model testing is represented and there is no need to repeat.
- *Results* including the findings compare it with the findings of previous and interpretation of compliance or inconsistency of findings with research findings and theories.

- *Conclusion* includes a summary of the problem, provide a summary of the results and overall conclusion and recommendations based on the results (policy recommendations is necessary only in applied research and, if necessary, recommendations for future research accordant with the research limitations or how development of current research;
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I am pleased to announce that the Ferdowsi University of Mashhad is publishing Iranian Journal of Accounting, Auditing & Finance (IJAAF). On behalf of the board of the IJAAF and my co-editors, I am glad to present the Volume 1, Issue 1 of the journal in December 2017; the journal will publish four issues in a year. The board includes experts in the fields of accounting, finance and auditing, all of whom have proven track records of achievement in their respective disciplines. Covering various fields of accounting, *IJAAF* publishes research papers, review papers and practitioner oriented articles that address significant issues as well as those that focus on Asia in particular. Coverage includes but is not limited to:

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Yours faithfully,
Mahdi Moradi
Editor in Chief

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Quarterly

RESEARCH ARTICLE

The Effect of Company Ownership Structure on the Stock Price Crash Risk in Iran: A Panel Co-Integration Approach with Cross-Sectional Dependence

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ARTICLE INFO

Abstract

Investors are often unwilling to buy shares of companies that have experienced a sharp drop in their prices. Therefore, considering the importance of the phenomenon of falling stock prices, in this research, using the Cup-FM method, the effect of factors affecting the risk of falling stock prices in companies listed on the Tehran Stock Exchange has been studied, with an emphasis on the ownership structure of the companies. In this research, 74 companies were studied as a research sample. The data relating to these companies from 2014 to 2020 are extracted from the financial statements of the companies Rahavard Navin Software and the Codal Website and are used for analysis. The estimation results of the model show the influence of managerial ownership, rate of return on assets (ROA), the market value of the company's assets to its book value and the share of 10 major shareholders on the risk of falling stock prices are negative. These effects are statistically significant since the presence of company managers among the company's shareholders reduces the incentive to manipulate the stock price and thus reduces the risk of the stock price falling. Moreover, high financial leverage, institutional ownership and company size positively affect the risk of stock price fall. In this research, the factors affecting the fall in stock prices of active companies in the Tehran Stock Exchange have been studied with emphasis on the structure and diversity of ownership.

NUMBER OF REFERENCES
38

NUMBER OF FIGURES
-

NUMBER OF TABLES
3

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1. Introduction

Stock price plays a vital role in the decision of investors whether to buy or not to buy stocks. Shareholders generally prefer to invest in companies with low price volatility. Although positive price swings are pleasing to shareholders, a drop in stock price and subsequent decline is intolerable for most shareholders and can lead to a sharp drop in stock price. According to studies, stock prices fall more when bad news and bad company financial conditions are hidden and accumulated. With the one-time disclosure of this information, the stock price reacts negatively, drastically lowering the stock price. Sudden changes in stock prices occur in the form of falls and jumps in stock prices. One of the reasons for the fall in stock prices is the specialization of companies and the separation of management from their ownership. According to agency theory, each party seeks to maximize its interests. Therefore, one of the parties can take action for their own interests that conflict with maximizing the interests of other groups. One of the most apparent conflicts in agency theory is the conflict between managers and shareholders. A wide range of incentives, such as bonus contracts and tenure issues, encourage managers to avoid disclosing negative information and accumulate it within the company. If managers keep and accumulate bad news inside the company for a long period, a big gap (stock price bubble) will be created between the inherent price of the company's stock and the value set by investors (stock market value). When the mass of accumulated negative news reaches the point of explosion, it suddenly enters the market and causes price bubbles to burst and stock prices to fall (Ahmadi and Darseh, 2016). Due to the importance of the risk of falling stock prices in issues such as portfolio management and the pricing of capital assets, several studies have investigated the contributing factors. The results of these studies indicate that the components of corporate governance are among the factors affecting the risk of falling stock prices. In other words, one of the best tools that can be used to reduce the risk of falling stock prices and not disclosing information on time is the corporate governance mechanism. Because the two main goals of the corporate governance system are to reduce the company's risk by improving and promoting transparency and accountability and improving the long-term efficiency of the organization (Dianti et al., 2012). Further, one of the essential elements of corporate governance is shareholders and their ownership. Since shareholders play a crucial role in corporate governance criteria, their different combinations can affect the company's performance and how the company's information is reflected in the market. For example, large shareholders have an information advantage over other shareholders due to their influence in the company, which causes information asymmetry in the market and reduces liquidity. Therefore, about the short-term horizon, large shareholders pressure managers to sacrifice long-term investment and performance to maintain short-term profit growth and accelerate the recognition of good news instead of delaying the recognition of good news. This provides the basis for opportunistic actions of managers and increases the risk of future falls in stock prices (Kordestani and Khatami, 2016).

Moreover, there is another type of shareholder composition of management ownership, which, based on the hypothesis of alignment of equity rights, with the increase in the percentage of managerial ownership, there is a greater alignment of the interests of managers with the interests of shareholders. Therefore, managerial ownership is an important mechanism considered to limit management's opportunistic behavior. Also, when managers seek to increase their wealth, their conflict with shareholders increases, and if the management has a share in the company's ownership, the interests of managers and shareholders converge. Therefore, the information asymmetry between shareholders and managers is reduced, resulting in a reduced risk of falling stock prices. According to the above, the question raised is what factors can affect the fall in the share prices of active companies on the Tehran Stock Exchange? Can the diversity and ownership structure of companies affect the fall in the stock prices of these companies? In order to answer these questions, the factors

affecting the fall in the stock prices of active companies on the Tehran Stock Exchange have been studied with emphasis on the structure and diversity of ownership.

2. Literature Review

2.1. Stock price crash risk

A stock price crash is a phenomenon in which a sudden and negative revision of investors' expectations about a company's stock occurs. Besides, sophisticated investors have lower risk and higher expectations, which are closer to objective criteria than other investors with a lower level of complexity (Stålnacke, 2019). The sudden changes in stock prices have recently attracted the attention of many academics and professionals. It can be said that the stock price crash is a phenomenon in which the stock price undergoes a sudden and severe negative adjustment (Chen, Hong and Stein, 2001). A stock price crash has three characteristics: First, a stock price crash is a very large and unusual change in stock prices that occurs without a significant economic event. Second, these changes are very large and negative. Third, the fall in stock prices is a contagious phenomenon at the market level; that is, the fall in stock prices is not limited to a specific stock but includes all types of stocks in the market (Chen, Hong and Stein, 2001). Several studies have investigated the external and internal factors affecting the risk of falling stock prices, including:

Chen, Hong and Stein (2001) test a model in which investor opinion heterogeneity, combined with short-term selling constraints for some investors, leads to stock price falls. The main reason for the stock price fall in their model is not the internal reasons of the company but the accumulation of bad news caused by an external characteristic of the financial market and short-term selling restrictions. In contrast, Jin and Myers (2006) developed a model in which a firm's internal characteristics, such as agency conflicts between inside and outside investors, along with the lack of transparency of the company for outside investors, lead to a fall in the stock price. They found that information opacity increases the probability of stock price crashes (Kim et al., 2021).

Jin and Myers (2006) measured opacity at the annual country level (i.e., the average opacity of all firms in a country in a year). Therefore, measuring the lack of transparency is not a firm-specific variable. Hutton et al. (2009) extended the study of Jin and Myers (2006) by examining the relationship between the risk of falling stock prices of companies and the lack of transparency of company-specific financial reporting (sum of absolute discretionary accruals in the previous three years) and it was found that the lack of transparency of the company's financial reporting increases the probability of the stock price falling (Kim et al., 2021). According to Hutton et al. (2009), several studies have investigated the determinants of stock price crash risk at the firm level. First, Kim and Zhang (2014) found that tax avoidance provides managers with the tools to hide bad news from shareholders, thereby increasing the risk of collapse. Second, Kim, Luo and Xei (2016) found that the comparability of financial statements reduces the accumulation of bad news and thus reduces the risk of collapse. Callen and Fang (2015) also argue that religion, as a set of social norms, helps prevent the accumulation of bad management news. They found that companies in cities with higher levels of religiosity are less prone to stock price declines. In summary, the above studies identify the determinants of stock price crashes associated with the accumulation of bad news (Kim et al., 2021).

2.2. Ownership structure

The relationship between the shareholders and managers of the company is full of conflict of interest that comes from the separation of ownership and control, the difference in goals of shareholders and managers, and the asymmetry of information between managers and shareholders (Dey, 2008), which is expressed by the conflict of the agency.

An agency relationship is a contract whereby one or more persons employ another person to perform services on their behalf and delegate decision-making authority to him (Jensen and Meckling, 1976). Information asymmetry has caused the cost of capital to rise, and information asymmetry models show that this relationship is driven by the gap between the costs of internal and external resources, which results from management having superior information relative to shareholders. Therefore, the agency cost theory predicts a positive relationship between investment and cash flows in such a way that managers tend to overinvest when companies generate additional internal cash flows. These theories indicate that companies facing information asymmetry problems or higher agency costs will face a higher gap between internal and external financing. And for this reason, capital expenditures will be more sensitive to the availability of internal resources (Attig et al., 2012). As a result, to promote corporate governance and increase managers' accountability to shareholders and other stakeholders, intervention is necessary. The ownership structure is one of the important issues of corporate governance that affects the motivation of managers and can significantly affect the efficiency of companies (Kumar, 2005).

2.3. Explaining the relationship between ownership structure and stock price fall

Forecasting the risk of falling stock prices in the future has attracted considerable attention in academic and empirical studies, especially after the recent financial crisis. Corporate managers often have incentives to exaggerate financial performance and maintain inflated stock prices by strategically hiding bad news and accelerating the release of good news. When the accumulation of bad news exceeds a certain threshold, the overpricing bubble bursts and a sudden stock price crash occurs (Hutton et al., 2009; Jin and Myers, 2006). Current literature mainly focuses on different accounting mechanisms to identify the determinants of crash risk. Considering that managerial opportunistic behavior is caused by the separation of ownership and control of the company, this study examines the structure of corporate ownership and tries to find out how the concentration of ownership affects the risk of falling stock prices in companies listed on the Tehran Stock Exchange. According to the existing literature, there are two opposing views on the relationship between corporate ownership concentration and stock price crash risk. The supervisory role played by large shareholders can align the interests of large and small shareholders. Therefore, centralized ownership can reduce the risk of a particular company's stock price falling. However, the influence effect of large shareholders shows that the presence of large shareholders can increase the risk of a company collapse.

Shleifer and Vishny (1986, 1997) state that major shareholders monitor corporate governance because they are motivated to gather information about the company and review investment decisions and operational activities. Hutton et al. (2009) found that major shareholders help company managers not to manipulate stock prices. In addition, Grossman and Hart (1988) and Mitton (2002) found that when the ownership structure is concentrated, controlling shareholder interests are highly correlated with firm performance and hence with the interests of small investors. This is considered the effect of convergence. Evidence obtained from Chinese listed companies shows that if there are several large shareholders in a company, they balance each other's effects well. This prevents the stock price from bubbling up and forces major shareholders to disclose more information (Liu, 2006). As a result, it improves the quality of information disclosure and reduces the risk of falling stock prices.

Therefore, it can be assumed that "there is a negative relationship between the ownership structure and the risk of falling stock prices." On the other hand, Croce, Stewart, and Yermo (2011) argue that blockholders (major shareholders) are sometimes myopic, which can lead to increased asset bubbles. Graves and Waddock (1990) and Porter (1992) suggest that if major shareholders are overly concerned with short-term stock prices, they tend to encourage corporate managers to pursue short-term profits rather than long-term corporate development.

Jebran, Chen and Zhang (2022) show how board social capital influences stock price crash risk. Considering that directors are embedded in two kinds of social capital, internal and external, the association of internal and external board social capital with the future stock crash is theoretically proposed and empirically presented. A sample of Chinese firms from 2004 to 2018 is used, and findings reveal that internal board social capital, and networking experience among directors within a board, increase future stock crashes. By contrast, external board social capital, the external social networks of directors, reduces future crash risk. Moreover, institutional investors' monitoring attenuates the effect of internal social capital but increases that of external social capital on future crash risk. Furthermore, information quality, accounting conservatism, and tax avoidance are three potential channels that explain the relationship between social capital and crash risk .

Ryu and Chae(2021) investigate the effect of managerial ownership level in distribution and service companies. The results indicate that the stock price crash risk was reduced as managerial ownership levels increased. The managerial ownership level has a significant negative coefficient on stock price crash risk, negative conditional return skewness of firm-specific weekly return distribution, and asymmetric volatility between positive and negative price-to-earnings ratios. Zachro and Utama(2021) show that multiple positions bring no effect on the stock price crash risk due to cross-over interaction which negated the substantial effect on the risk of stock price crashes. As a country with high family ownership concentration, the results illustrate that family firms in Indonesia will strengthen the influence of Commissioners who hold multiple positions in reducing stock price crashes risk. Waqas and Siddiqui (2021) show a significant negative effect of accounting conservatism on firms' stock price crash risk. This study also finds that managerial ownership enhances the stock price crash risk of the sample firms significantly as a moderator. At the same time, there is no significant moderating influence of institutional ownership. Taghizadeh Khaneghah and Badavarnehandi (2018) investigated the relationship between corporate philanthropy and the risk of falling stock prices, emphasizing information asymmetry in companies listed on the Tehran Stock Exchange. Cash and non-cash donations were used to measure the company's philanthropy, as well as to measure the risk of falling stock prices, the index of negative skewness of monthly stock returns and the fluctuation of high and low stock returns were used, and they showed that there is a significant negative relationship between corporate philanthropy and the risk of falling stock prices. The investigated companies were also divided into companies with high and low information asymmetry using growth opportunities. The results showed that the negative correlation between corporate philanthropy and the risk of falling stock prices is stronger for companies with high information asymmetry. The results show that corporate philanthropy has economic consequences such as reducing stock price volatility, and increasing responsibility reduces managers' willingness not to release bad news. Barzegar and Khatami (2018) showed a positive and direct relationship between the variable of managerial ownership and the risk of falling stock prices; that is, with the increase of managerial ownership, the risk of falling stock prices increases. In addition, agency costs affect the relationship between managerial ownership and stock price risk. This means that the effect of managerial ownership on increasing the risk of future stock price falls is greater in companies with higher agency costs. Zarei et al. (2018) found a significant and inverse relationship between the decision-making power of CEOs and the risk of falling stock prices. The results show that CEO tenure

has the greatest impact on decision-making power among the three factors that determine the decision-making power of CEOs. Yeung and Lento (2018) considered three dimensions of the governance mechanism: ownership structure, board structure, and audit quality, which include 15 individual characteristics. These governance features are intended to increase management control, enhance effective decision making, and limit opportunistic behavior. The results showed that a strong ownership structure and higher audit quality are associated with lower stock price crash risk. The authors also found that the board's structure has no significant relationship with the risk of falling stock prices. Given that, the authors concluded that the better the company's corporate governance, the lower the information asymmetry between shareholders and management, and as a result, the lower the probability of future stock price falls.

Habib and Hassan (2017) indicate that managerial ability reduces underinvestment, strengthens overinvestment and generally increases the deviation in the expected level of investment. Management ability also significantly increases the risk of falling stock futures prices. In addition, good financial reporting quality reduces the risk of falling stock futures prices.

Kim and Zhang (2016) found that companies with CEO overconfidence have a high stock price crash risk, and the effect of managerial overconfidence on stock crash risk is greater when the CEO has more control over the senior management team. Also, their results show that the effect of the CEO's overconfidence on the risk of stock price fall is less for companies with more conservative policies. Coffey and Fryxell (1991) and Manconi (2012) found that if monitoring the company's management requires a lot of capital and time, block holders tend to sell their shares directly instead of performing their duties. In addition to the short-term investment horizon of large shareholders, they are criticized for having influence. This phenomenon refers to a situation where large shareholders are incentivised to expropriate small investors' interests and increase their own interests. Under these conditions, the disclosure of manipulated information increases the risk of falling stock prices. Therefore, according to the theoretical foundations and background, the research hypothesis is proposed as follows:

Research hypothesis: There is a positive and significant relationship between the ownership structure and the risk of falling stock prices.

3. Research Methodology

The present study examines the factors affecting the fall in stock prices in companies listed on the Tehran Stock Exchange, emphasising ownership structure. For this purpose, company data has been collected from 2014-2020. Then the model is estimated using the panel data method.

$$CRASH_{it} = \alpha_i + \beta_1 MANAGE_{it} + \beta_2 INST_{it} + \beta_3 BOARD_{it} + \beta_4 OWNER_{it} + \beta_5 SIZE_{it} + \beta_6 ROA_{it} + \beta_7 MB_{it} + \beta_8 LEV_{it} + \beta_9 SOE_{it} + U_{it}$$

In this model, the dependent variable is the risk of the stock price falling, and to measure, the low-to-high volatility ratio (DUVOL) is used as follows. According to the study by Kim, Luo and Xei (2016), this criterion has been used as an index to measure the risk of falling stock prices. Kim, Luo and Xei (2016) believe that the low-to-high volatility ratio (DUVOL) is a better indicator for measuring the risk of falling stock prices.

$$DUVOL_{iT} = Log\left[\frac{(n_u - 1)\sum_{Down} R_{it}^2}{(n_d - 1)\sum_{Up} R_{it}^2}\right]$$

Where n_u and n_d are the numbers of days when the share price is high and low in year t, respectively. For each company and during year t, the stock return of a company may be lower or higher than its annual average in year t. A high DUVOL ratio indicates a high risk of falling stock prices. R^2 it is the second power of the return of the i-th share at time t and is calculated from the following equation.

$$r_{it} = \alpha_i + \beta_{1,i}R_{M,t-1} + \beta_{2,i}R_{M,t} + \beta_{3,i}R_{M,t+1} + \varepsilon_{it}$$

Where $r_{i,t}$ is the yield of the i-th share at time t and $R_{M,t-1}$, $R_{M,t}$, $R_{M,t+1}$ are the market earnings on day t, T-1 and T+1, respectively. The regression residual is the daily yield of the i-th share at time t. Also, in this study, the control variables of the model are financial leverage LEV, ROA rate of return on assets, MB ratio of the market value of company assets to book value, SIZE of company size or natural logarithm of company assets, OWNER share of 10 major shareholders, BOARD size of the board of directors, MANAGE is the percentage of managerial ownership and INST is the percentage of institutional ownership.

3.1. Statistical population

The statistical population of this research includes all companies listed on the Tehran Stock Exchange. In order to take a sample, a systematic elimination method was used and the companies included in the sample must have the following conditions.

- Be among the accepted companies of the Tehran Stock Exchange before 2013.

- The end of their financial year should be the end of March every year.
- They have not changed their financial year during the period under review.

- The studied companies should not be among investment companies, banks and holding companies

In this way, 74 companies were studied as a research sample. The data and information related to these companies from 2014 through 2020 are extracted from the companies' financial statements, Rahavard Navin software and the Codal Website and used for analysis.

The estimation method of the research model in this article is the panel data method. It is generally assumed that the data used have cross-sectional independence in panel data econometrics. This assumption, like other assumptions, may not be true. Therefore, the first step in panel data econometrics is to determine cross-sectional dependence or independence before performing any test since the dependence between sections can exist due to factors such as external consequences, regional and economic relations, and the interdependence of remaining uncalculated components and unusual unobserved factors between different sections. Several tests have been proposed for this purpose in econometrics; the tests of Friedman (1937), Breusch-Pagan (1980) and Pesaran's CD test (2004) are some of these tests. Pesaran (2004) presented a test to detect cross-sectional dependence or independence for balanced and unbalanced panels. This test is applicable for balanced and unbalanced panel data and has favorable characteristics in small samples. Also, unlike Breusch-Pagan's method, it has provided reliable results for large cross-sectional dimensions and small time dimensions. It is resistant to one or more structural failures in individual regression slope coefficients. The null and competing hypotheses of this test are defined as follows:

$$H_0: \ \rho_{ij} = \rho_{ji} = E(u_{it}v_{it}) = 0 \text{ For all } i \neq j$$
$$H_1: \ \rho_{ij} = \rho_{ji} = E(u_{it}v_{it}) \neq 0 \text{ For some } i \neq j$$

For balanced panels, the CD test statistic can be calculated as follows:

$$CD = \sqrt{\frac{2T}{N(N-1)}}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right)$$

Where $\hat{\rho}_{ij}$ Pearson's pairwise correlation coefficients are among the residuals, suppose the calculated CD statistic is greater than the critical value of the standard normal distribution at a certain significance level. In that case, the null hypothesis will be rejected and cross-sectional dependence will be concluded.

Suppose cross-sectional dependence is confirmed in panel data. In that case, conventional panel unit root methods such as Levin and Lin (LL), Im, Sons and Shin (IPS) tests, etc., will increase the probability of false unit root results. Several panel unit root tests have been proposed despite cross-sectional dependence, including the cross-sectional generalized ADF unit root (CADF) test to solve this problem. In other words, Pesran (2004) proposed a test statistic to check the presence or absence of a unit root by converting the ADF and IPS tests by considering cross-sectional dependence, known as Pesran's CIPS test. The statistic of this test is as follows:

$$CIPS(N,T) = \frac{1}{N}\sum_{i=1}^{N}\tau_i(N,T)$$

Where ti is the CADF model statistic for each individual cross section in the panel, the value of the CIPS statistic is compared with the critical values calculated by the Pesaran. Suppose this statistic is greater than the critical values. In that case, the null hypothesis (non-stationary status of the variable) will be rejected and the stationary status of the variable will be accepted.

In addition, if cross-sectional dependence is confirmed, conventional panel cointegration methods such as Kao (2006), Pedroni (1996), etc., will increase the probability of false clustering results. In order to solve this problem, several panel tests have been proposed, among which is the method proposed by Westerlund and Edgerton (2008). Westerlund Edgerton's (2008) cointegration test is one of the tests that give valid results if there is cross-sectional dependence in an unspecified structural fracture across the intercept and the slope of the cointegration regression as error sentences with frequent correlation and the heterogeneity of variances.   The null hypothesis of this test is the absence of collinearity and the hypotheses H_0 and H_1 are tested by LM statistics. The Z statistic is defined for testing the hypotheses H_0 and H_1.

$$Z_j(N) = N^{1/2}(LM_j(N) - E(\hat{B}_j))$$
$$Z_j(N) \rightarrow N(0, Var(B_i))$$

The Z statistic has a normal distribution with zero mean and constant variance. The obtained Z statistic is compared with the critical values of this statistic calculated by Westerlond and Edgerton. If the calculated Z statistic is greater than its critical value, the null hypothesis is rejected and the variables will have a collinear relationship. Although several methods have been proposed to investigate the panel cointegration relationship between variables, most of these methods only discuss the presence or absence of the relationship and do not provide information about the cointegration vector. Several methods have been proposed to solve this shortcoming, one of which is the frequently updated and fully adjusted estimation method (Cup-FM).

Bai and Kao (2006) proposed an estimator called fully adjusted frequent updating (Cup-FM), which uses factor structure to identify the source of cross-sectional dependence and provides the

cointegration vector. This method recursively calculates the coefficients of the cointegration vector by estimating the parameters and the long-term covariance matrix and factor loadings.

Like the Fully Modified Ordinary Least Squares (FMOLS) estimator, this estimator is resistant to serial autocorrelation bias and endogeneity bias. In addition, it is indifferent to the normality and non-normality of the explanatory variables. Bai and Kao (2006) assumed that the error term of the regression equation follows the following factor model to consider cross-sectional dependence.

$$\upsilon_{it} = \lambda_i F_t + e_{it}$$

Where Ft is a vector of $r \times 1$ common factors and λ1 is a vector of $r \times 1$ factor loads. Therefore,

$$\sigma_{it} = x_{it}\beta + \lambda_i F_t + e_{it}$$

Bai and Kao proposed the following estimator for the coefficient vector: the Cup-FM estimator.

$$\hat{\beta}_{cup\_FM} = \left[\sum_{i=1}^{N}(\sum_{t=1}^{T}\hat{y}_{it}^{+}(\hat{\beta}_{cup})(x_{it}-\overline{x}_i)' - T(\hat{\lambda}_{it}'(\hat{\beta}_{cup}) + \hat{\Delta}_{uzi}(\hat{\beta}_{cup})))\right]^{-1}\left[\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it}-\overline{x}_i)(x_{it}-\overline{x}_i)'\right]$$

Where

$$\hat{y}_{it} = y_{it} - (\lambda_i\Omega_{Fei} - \Omega_{Mei})\Delta x_{it}$$

Ω is the estimate of the long-run covariance matrix and xi is the cross-sectional mean of variable x. Other variables are like before and $\hat{\Delta}_{uzi}$ are defined as $\hat{y}_{it}$. It is important to mention that the values of y, Ω, and β are estimated iteratively to achieve convergence. In this research, STATA and Eviews software have been used for econometric analysis.

4. Research findings

The first step is performing the cross-sectional correlation test to estimate the model using the panel data method. In this research, the cross-sectional dependence Pesaran test was conducted for the model under study; the statistical value of this test is shown in Table (1). According to the results of this table and the critical values of cross-sectional dependence Pesaran test has a normal distribution and is equal to the values of 1.64, 1.96 and 2.57 at the levels of one percent, five percent, and ten percent, respectively. The null hypothesis based on the absence of cross-sectional dependence in the model is rejected at the level of one percent and the existence of cross-sectional dependence between the model variables is accepted.

Table 1. The Results of cross-sectional dependence Pesaran Test

Model	Pesaran's CD calculated the statistic value	Result
Model 1 (dependent variable: low to high volatility ratio)	3.240	The presence of cross-sectional dependence confirmed

Source: research calculations

Due to the existence of cross-sectional dependence in the model based on the relevant test, the CIPS statistic of Pesaran has been used to check the presence or absence of a unit root. The results of this test are presented for all variables and assume the existence of intercept and trend (C+T). Based on these results and the critical values presented by the Pesaran, it can be concluded that all the variables are at the significance level of five per cent.

Table 2. The Results of the unit root test based on Pesaran's CIPS statistic

Variable	With intercept and trend	Result
CRASH	-2.270*	I(0)
MANAGE	-2.310*	I(0)
INST	-2.420*	I(0)
BOARD	-2.940*	I(0)
OWNER	-2.190*	I(0)
SIZE	-2.410*	I(0)
MB	-2.850*	I(0)
ROA	-2.540*	I(0)
LEV	-2.240*	I(0)
SOE	-2.480*	I(0)

Source: research calculations

*indicates the stationary status of variables at the first order difference level

It can be seen that all the variables at the level of the variables are normalized and accumulated from the order of zero. Now, without worrying about false regression, we can estimate the models. For this purpose, the Cup-FM estimator has been used. GAUSS software was used to estimate the model; its results are presented in Table (3). It should be noted that in the Cup-FM method and the GAUSS software, the intercept value is not provided automatically. If necessary, it can be calculated manually and inserted into the regression equation of the research.

Table 3. The Model estimation results with the Cup-FM estimator

Variable	Coefficient	T-Statistic
C	0.180	1.100
MANAGE	-0.250	-2.190*
INST	0.190	2.780*
BOARD	0.100	1.270
OWNER	-0.200	-2.380*
SIZE	0.160	2.620*
MB	-0.140	-2.950*
ROA	-0.130	-2.750*
LEV	0.110	3.260*
SOE	0.180	1.210

Source: research calculations

*indicates the significance of coefficients at 5% of significance level

Based on the estimation results of the model, at a significant level of 5%, the amount of institutional ownership has a positive and significant effect on the risk of falling stock prices. In other

words, the presence of institutional investors among the shareholders of a company, according to their short-term perspective, increases the possibility of the rapid growth of the stock price and thus increases the risk of the stock price falling. The level of managerial ownership also has a negative effect on the risk of falling stock prices. This effect is statistically significant at a significance level of 5% since the presence of the company's managers among the company's shareholders reduces the incentive to manipulate the stock price and, as a result, the risk of the stock price falling.

Financial leverage and company size also positively affect the risk of falling stock prices, which is statistically significant at a significance level of 5%. In other words, the larger the company's size, the more difficult it is to audit the financial statements and monitor its activities compared to smaller companies. As a result, the risk of falling stock prices increases. The company's high financial leverage also positively affects the risk of falling stock prices and increases it. Also, the effect of the size of the board on the risk of falling stock prices was positive, but these effects are not statistically significant at the 5% level. Based on the results of the estimated model, the effect of the share percentage of 10 major shareholders on the risk of falling stock prices is negative, and these effects are statistically significant at the 5% level. In other words, owning more shares than the top 10 shareholders of the company reduce the risk of the stock price falling. Because, in this case, the incentive to control the stock price by the major shareholders will be greater. The effect of return on assets (ROA) and the ratio of the market value of the company's assets to the book value is negative on the risk of falling stock prices. These effects are statistically significant at a significance level of 5%. In other words, the higher the rate of return on assets and the ratio of the market value of the company's assets to the book value, the lower the risk of falling stock prices in that company and vice versa.

5. Discussion and conclusion

Considering the importance of the phenomenon of falling stock prices, in this research, using the Cup-FM method, the effect of factors affecting the risk of falling stock prices in companies listed on the Tehran Stock Exchange has been studied, with an emphasis on the ownership structure of the companies. Based on the estimation results of the model, institutional ownership has a positive and significant effect on the risk of falling stock prices. In other words, the presence of institutional investors among the shareholders of a company increases the risk of falling stock prices. The level of managerial ownership also significantly negatively affected the risk of falling stock prices. Because the presence of company managers among the company's shareholders reduces the incentive to manipulate the stock price and thus reduces the risk of the stock price falling. Financial leverage and company size also positively affect the risk of falling stock prices. In other words, the larger the company's size, the more difficult it is to audit the financial statements and monitor its operations compared to smaller companies. As a result, the risk of falling stock prices increases. The company's high debt compared to its assets (high financial leverage) also positively affects the risk of falling stock prices and increases it. Also, the effect of the size of the board on the risk of falling stock prices was positive, but this effect was not statistically significant at the 5% level. Based on the results of the estimated model, the impact of the share percentage of ten major shareholders on the risk of falling stock prices has been negative. In other words, owning more shares than the company's top ten shareholders reduces the stock price risk. Because in this case, the incentive to control the stock price by the major shareholders will be greater. The effect of return on assets (ROA) and the ratio of the market value of the company's assets to the book value is negative on the risk of falling stock prices. In other words, the rate of return on assets and the market value of the company's assets to the book value reduces the risk of the stock price falling in that company and vice versa. The results of this

research are in line with Barzegar and Khatami (2018), who found a positive and direct relationship between managerial ownership and the risk of falling stock prices. It is contrary to the research of Yeung and Lento (2018), who found that the board's structure has no significant relationship with the risk of falling stock prices.

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RESEARCH ARTICLE

Presenting the Development of the Beneish Model with Emphasis on Economic Features using Neural Network, Vector Machine, and Random Forest

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Abstract

As the business process becomes more complex, financial statement distortion risk increases. In this regard, researchers have been looking for models to detect fraud in financial statements. Beneish (1997) predicted earning manipulation using financial ratios and accruals. Since economic pressure is presented as a manager's external motivation to manipulate income, the Beneish model is developed based on economic variables, including Inflation Rate, GDP Growth, Exchange Rate, and Economic Growth Rate. The fitting of the random forest, vector machine, and neural network was used to fit the extended model. The results show that the accuracy of the random forest model is 99.96% which is more than the neural network and vector models, 96.1% and 93.62%, respectively. The final results show that the developed model is more accurate than the basic Beneish model. The results show that economic factors play a significant role in fraudulent financial reporting which should be considered when analyzing financial reporting.

1. Introduction

Today, fraud is considered the most severe threat to the public interest and the capital market, which has quadrupled over the past decade and its destructive effects continue. The global cost of fraud is estimated at over $ 3.5 trillion annually. This allows for a specialized look at the factors that lead to fraud and ways to prevent it. According to the concept of the fraud triangle, pressure, opportunity, and justification are the factors that cause fraud. One of the pressure factors on companies' fraudulent reporting is economic pressure (Ahmad et al., 2021). Classification of types of financial reporting can be done as follows: 1) conservative 2) neutral 3) aggressive, and 4) fraudulent (Dechow and Skinner, 2000). If the economic situation of countries is not good, pressures on the company's management will affect earning manipulation and fraud. National Commission on Fraudulent Financial Reporting (NCFFR) in 1987 defined fraudulent reporting as the intentional use of a procedure or the non-application of a process that resulted in a material misstatement of the financial statements. Jofre and Gerlach (2018) believe that accounting fraud aims to mislead shareholders about the correct financial situation by overstating expectations of assets or underestimating debts, leading to an artificial overstatement of earnings or equity returns.

2. The Conceptual framework and literature

Association of Certified Fraud Examiners (ACFE) provided a comprehensive overview of the general practice of financial statement fraud, according to which although financial fraud is more unusual than corruption and misuse of assets, the cost of each event averages $ 800,000 compared to the average of $ 250,000 corruption and average $ 114,000 asset misuse. Therefore, many researchers have sought to predict fraud using financial statement variables. Beneish (1997) used financial ratios and accruals to predict profit manipulation methods. He used three sources to select explanatory variables due to the lack of appropriate economic theory to manipulate financial information. The first source is to examine the future signs of the company. He explained that profit is more likely to be manipulated when the company's weak future position is weak. The second source, based on the model of Jones (1985), was the selection of variables based on cash flows and accruals. Finally, based on the positive theory of Watts and Zimmerman (1986), he used the contractual hypothesis. The result of his study was the development of an eight-variable model based on financial statement data. In his modeling between 1997 and 1999, Beneish stated that companies that manipulate their financial information do not use only accruals, and different variables should be used to determine financial information manipulation. These variables help identify companies that manage profits or companies that do not perform their transactions according to accepted accounting principles (Beneish, 1997, 1999).

To develop the Beneish model, four economic variables as following is added to the model:

2.1. Inflation

Inflation has long been considered one of the most important economic variables affecting fraud. The relationship between inflation and fraud is one of the most controversial issues among researchers. Under inflation conditions, companies' nominal profits increase over time. However, the profitability of companies has not increased. Another effect of inflation is that it reduces the intrinsic

value of each share. In years when inflation is high, the quality of companies' real earnings (economic income) decreases (Ahmad et al., 2021).

2.2. Gross domestic product

Gross domestic product is the market value of all the final goods and services produced in a country over a year. Gross domestic product in each year represents the total performance of economic sectors in the use of resources and production of goods and services. Gross domestic product and its components include many figures related to the performance of enterprises. Corporate income is an essential component of GDP, from which investors pay dividends. Therefore, it is reasonable to say that investors will push stock prices to increase if they anticipate a boom in economic conditions (Pezhoyan and Azizi, 1999).

2.3. Exchange rate

The exchange rate, as a measure of the value of a country's national currency against the currencies of other countries, reflects that country's economic situation compared to other countries' economic conditions. The real exchange rate is a critical variable in an open economy because of its interrelationship with other economic variables, which are greatly influenced by domestic and foreign economic policies and developments. One of the critical issues in real exchange rates, especially in underdeveloped and developing countries, is the instability and the intensity of exchange rate fluctuations and their effect on the performance of various macroeconomic variables and sectors (Avdjiev et al., 2018).

2.4. Economic growth

In simplest terms, economic growth refers to an increase in aggregate production in an economy. Often, but not necessarily, aggregate gains in production correlate with increased average marginal productivity. That leads to increased incomes, inspiring consumers to open their wallets and buy more, which means a higher material quality of life or standard of living. Shakouri et al. (2021), using data from 161 companies on Tehran Stock Exchange from 2009 to 2018, showed that the Beneish model could separate fraudulent companies from non-fraudulent companies. They showed that the accounts receivable index, profit margin index, asset quality index, sales growth index, depreciation index, and total assets accrual index have a positive and significant effect on fraudulent reporting. In contrast, the public, administrative, sales expenses and leverage index significantly negatively affect fraudulent reporting.

Rahimian and Haji Heidari (2019) show that the ratio of sales to total assets and equity to total assets are two financial ratios sensitive to fraud. Their model has an overall accuracy rate of 69.1 percent. Shirazi Dehqavarkhani and Haghgoo (2018) conducted a study entitled "Investigating the relationship between business strategy and fraudulent financial reporting," emphasising the role of disclosure quality in companies listed on the Tehran Stock Exchange. Their results show that a defensive management strategy has a negative effect on fraudulent financial reporting, but an aggressive management strategy positively affects fraudulent financial reporting. The disclosure quality negatively affects the relationship between defensive management strategy and fraudulent financial reporting. But this variable does not significantly affect the relationship between aggressive management strategy and fraudulent financial reporting. Ebrahimi et al. (2017) conducted a study entitled determining the effect of audit quality and shareholders' rights on fraudulent reporting in financial statements. Their results show that audit quality has a negative effect on fraudulent reporting

in financial statements. The results of their research also show a negative relationship between compliance with shareholders' rights and the possibility of fraudulent reporting.

Jamali (2016) investigated the relationship between selective corporate governance mechanisms and audit quality on the occurrence of fraud in the financial statements of companies listed on the Tehran Stock Exchange. Testing his hypotheses showed that the independence of board members, ownership percentage, the quality of the audit firm, and the tenure of the board chairman have a negative effect on fraud. However, the CEO's dual role, losses in the previous two years, and the auditor's tenure positively affect the likelihood of fraud in the financial statements. Finally, the number of board meetings, the size of the audit firm, and the ownership of institutional shareholders do not affect the likelihood of fraud.

Erdoğan and Erdoğan (2020) used the Beneish model to examine fraudulent companies on the Istanbul Stock Exchange. After identifying fraudulent companies, they obtain a positive relationship between fraudulent financial information and the index of asset quality and public, administrative, and sales expenses.

Li and Zaiats (2018) focus on the corporate information environment, examining the extent of profit manipulation by companies operating in a poor information environment. They showed that companies with high information asymmetries, and inadequate information environment, have a good platform for profit manipulation, and managers of these companies are more motivated to manage profits. Companies that are good at disclosing information and reporting on time and for various reasons have created a transparent information environment for users of financial statements to be less likely to manage profits.

Research Hypotheses:
1- Beneish model can predict the companies manipulating earnings.
2- The developed model of Beneish has more predictive power than the original model of Beneish.

3. Research Methodology

This research is applied research, and the research method is descriptive-correlational research. In addition, in the present study, after selecting the effective variables, a model was developed and presented. The present study is quantitative and archival research according to the data type. In addition, SPSS software is used to test research hypotheses.

3.1. The statistical population of the study

The statistical population of the research is the companies listed on the Tehran Stock Exchange. Due to the available audited information of companies operating in the stock exchange, this population has been used to study research models. The research sampling method is a systematic removal method that is used to homogenize the selected sample and increase the comparability of the sample, which includes the following limitations:

1. The information required for the research should be available; 2. Since the research period is from 2011 to 2019, sample companies should have been listed on the stock exchange before the fiscal year 2011. 3. Sample companies are not listed in banks, financial institutions, investment funds, or

leasing industries. To increase the comparability of their fiscal year information, it should end in the Esfand month. According to the sampling conditions, 139 companies were selected as a statistical sample.

3.2. Data analysis

In this research, the main model of Beneish is first tested and compared with its developed model.

The primary model of Beneish:

$$EM = a_0 + a_1 DSRI + a_2 GMI + a_3 AQI + a_4 SGI + a_5 DEPI + a_6 SGAI + a_7 ATA + a_8 LVGI$$

The developed model and research variables

$$EM = a_0 + a_1 DSRI + a_2 GMI + a_3 AQI + a_4 SGI + a_5 DEPI + a_6 SGAI + a_7 ATA + a_8 LVGI \\ + a_9 INF + a_{10} GDP + a_{11} EX + a_{12} GROW$$

The constituent variables of the Beneish model:

Days Sales in Receivables Index (DSRI): Due to changes in credit policies to increase sales, an increase in the receivables ratio (REC) to sales (SALES) occurs, but an abnormal rise in receivables also leads to an increase in revenue (Beneish, 1999).

$$DSRI = \frac{REC_t/SALES_t}{REC_{t-1}/SALES_{t-1}}$$

Gross Margin Index (GMI): If the gross profit margin exceeds 1, the gross profit margin has decreased significantly. The weakening of gross profit margin gives a negative signal to the company's outlook and increases the likelihood of earning manipulation (Beneish, 1999). In this regard, SALES is the company's annual sale, and COG is the cost of goods sold.

$$GMI = \frac{SALES_{t-1} - COG_{t-1}/SALES_{t-1}}{SALES_t - COG_t/SALES_t}$$

Asset Quality Index (AQI): If the asset quality exceeds 1, the company pays deferred costs and intangible assets, increasing the likelihood of earning manipulation (Beneish, 1999). In this regard, CA is the current assets and PPE of property, plant, and equipment, and ASSETS is the sum of assets.

$$AQI = \frac{1 - (CA_t + PPE_t)/ASSETS_t}{1 - (CA_{t-1} + PPE_{t-1})/ASSETS_{t-1}}$$

Sales Growth Index (SGI): High sales growth does not imply manipulation. High growth companies are more likely to commit financial fraud because their financial position and capital pressure managers to achieve earnings targets. If growth firms face large stock price losses at the first indication of a slowdown, they may have greater incentives to manipulate earnings.

$$SGI = \frac{SALES_t}{SALES_{t-1}}$$

Depreciation (DEPI): A falling level of depreciation relative to net fixed assets raises the possibility that a firm has revised the estimated useful life of assets upwards or adopted a new method that is income increasing. DEP, in this formula, is depreciation.

$$DEP = \frac{DEP_{t-1}/PPE_{t-1}}{DEP_t/PPE_t}$$

Leverage Index (LVGI): Leverage is measured as total debt relative to total assets. An increase in leverage creates an incentive to manipulate profits to meet debt covenants. LTD is long-term debt, and CL is current liabilities.

$$LVGI = \frac{LTD +_t + CL_t/ASSETS_t}{LTD_{t-1} + CL_{t-1}/ASSETS_{t-1}}$$

Sales, General and Administrative Index (SGAI): Analysts might interpret a disproportionate increase in SG&A relative to sales as a negative signal about a firm's prospects, thereby creating an incentive to inflate profits. SGA EXP is Sales, General, and Administrative Expenses.

$$SGAI = \frac{SGA\ EXP_t/SALES_t}{SGA\ EXP_{t-1}/SALES_{t-1}}$$

Total Accruals to Total Assets (TATA): Total accruals are calculated as the change in working capital (other than cash) less depreciation relative to total assets. Accruals, or a portion thereof, reflect how managers make discretionary accounting choices to alter earnings. Higher accruals are associated with a higher likelihood of profit manipulation. ACC is accruals calculated as the difference between operating cash flow and operating income.

$$TATA = \frac{ACC_t}{ASSETS_t}$$

3.2.1. Variables added to the Beneish model

Inflation rate (INF): The percentage change in the price index over a period (usually one year).

GDP Growth (GDP): is the sum of the Rial value of all final goods and services offered in the country over a specified period (usually one year).

Exchange Rate (EX): Price of a foreign currency (Dollar) in the national currency.

Economic growth rate (GROW): The increase in a country's production in a particular year compared to its value in the base year.

4. Data analysis

The results of data analysis using SPSS24 software are shown as descriptive and analytical statistics. The central limit hypothesis in probability theory states that if we sample a large number of an arbitrary distribution (with a sufficiently large number equal to 30), the mean sample distribution will move to the normal distribution; normally test is ignored in this study. To investigate the significant relationship between the Pearson correlation coefficient, Vector Machine and Random Forest Model and Neural Network are applied to fit the models.

4.1. Descriptive Statistics

Descriptive statistics provide an overview of how research data is distributed. The results of descriptive statistics are shown in Table 1.

Table 1. The Descriptive statistic

Variable	Mean	Std. Dev.	Min	Max
TATA	0.020	0.140	-0.630	1.350
LVG	1.010	0.420	0.060	12.290
SGA	1.870	3.610	-2.210	43.440
DEP	2.270	14.040	0.010	465.760
SG	1.322	1.740	0.000	57.050
AQ	1.390	4.570	0.010	106.700
GM	1.650	6.900	-45.880	136.650
DSR	15.170	380.890	0.000	12771.020
INF	22.800	11.290	9.000	41.20٠
٠EX	58.440	65.660	12.260	217.920
GROW	0.370	6.010	-7.70	12.500
GDP	1.870	3.650	-6.610	4.470

As is shown in Table 1, the maximum inflation is 41.2, which is for the year 2019, and the minimum is 9, which is for the year 2017. GDP and GROW have negative and positive growth years in the sample period.

4.2. Beneish Model

The Beneish model is fitted with 3 methods: Vector Machine, Random Forest, and Neural Network.

4.2.1. Vector Machine Method

Vector Machine is one of the data mining methods used for forecasting. Its most important task is to prioritize the variables affecting the dependent variable that enter the model in order. The results are shown in Table 2

Table 2. The Model by Vector Machine Method

Variables	Coefficient	Priority
TATA	0.020	Sixth
LVG	1.019	Seventh
SGA	1.855	Eights
DEP	2.249	Fifth
SG	1.336	Fourth
AQ	1.405	Third
GM	1.666	Second
DSR	15.174	First

According to the fitted Vector Machine model, the regression coefficients estimated in the Table are as above and the estimated fraud model is as follows:

$$MScore1 = 0.02TATA + 1.019LVG + 1.855SGA + 2.249DEP + 1.336SG + 1.405AQ + 1.666GM + 15.174DSR$$

The accuracy of the model is presented as follows:

Table 3. The Accuracy of Vector Machine Method

Beneish model	Accuracy
0	16%
1	100%
Total	93.03 %

According to Table 3, the accuracy of the Vector Machine Method is 93.03 percent.

4.2.2. Neural Network Model

The resulting neural network architecture consists of 12 input layers (independent variables), 1 middle layer with 8 units, and 1 output layer (dependent variables). The performance function used in the middle layer is the hyperbolic tangent function and the error function applied is the mean squared. It should be noted that 69.7% of the data equivalent to 840 were used as a training sample, and 30.3% of the data equivalent to 366 were used as a testing sample.

Table 4. The Assign the number of sample members

		N	Percent
Sample	Training	840	69.7%
	Testing	366	30.3%
	Valid	1206	100.0%
	Excluded	45	
	Total	1251	

According to table 5 the amount of error obtained from the fit of this model is equal to 161.834 in the training sample and the amount of error obtained in the testing sample is equal to 64.945. Since the amount of error obtained in the testing sample is less than in the training sample. Therefore, model fit is acceptable.

Table 5. The Comparison of model fit error

Training	161.834
testing	64.945

The effect of independent variables in entering the model is as shown in Table 6:

Table 6. The Neural network model variables

Variables	Coefficient	Priority
TATA	0.088	Fifth
LVG	0.211	First
SGA	0.076	Seventh
DEP	0.155	Third
SG	0.192	Second
AQ	0.060	Eighth
GM	0.086	Sixth
DSR	0.130	Fourth

Accuracy of the model presented in Table 7:

Table 7. The Accuracy of Neural Network

Training	Accuracy	Testing	Accuracy
21.04 %	0	26.4 %	0
99.7 %	1	99.6 %	1

According to table 7, the accuracy of a Neural Network is 99.7 percent.

4.2.3. Random Forest Model

Random forests or random decision forests are an ensemble learning method for classification, regression, and other tasks that operates by constructing a multitude of decision trees at training time. For classification tasks, the output of the random forest is the class selected by most trees. For regression tasks, the mean or average prediction of the individual trees is returned. Random decision forests correct decision trees' habit of overfitting their training set. Random forests generally outperform decision trees, but their accuracy is lower than gradient boosted trees. However, data characteristics can affect their performance. The first algorithm for random decision forests was created in 1995 by Tin Kam Ho using the random subspace method, which, in Ho's formulation, is a way to implement the "stochastic discrimination" approach to the classification proposed by Eugene Kleinberg.

Table 8. The Random forest model fit

Variables	Coefficient
SGI	18.518
SGAI	14.038
TATA	20.504
GMI	13.153
DSRI	34.579
LVGI	11.499
DEPI	62.424
AQI	9.354

According to table 8, the fitted random forest model, the regression coefficients are shown in Table 8, and the developed model is as follows:

$$MScore1 = 18.518SGI + 14.038SGAI + 20.504TATA + 13.153GMI + 34.579DSRI \\ + 11.499LVGI + 62.424DEPI + 9.354AQI$$

Accuracy of the model presented in Table 9:

Table 9. The Accuracy fitting of the random forest model

Beneish model	Accuracy
0	63 %
1	99.98 %

According to table 9, The accuracy of random forest is 99.98 percent.

In continuation, three models are fitted for developed Beneish.

4.3. Developed Beneish -Vector Machin

In Table 10, the Beneish method is used to predict fraud using significant independent variables, and how they are entered is prioritized.

Table 10. The Vector Machine Method

Variables	Coefficient	Priority
DSRI	-43.964	First
GMI	43.513	Second
AQI	39.315	Fourth
SGI	-41.670	Third
DEPI	35.329	Fifth
TATA	-26.985	Seventh
LVGI	-34.794	Sixth
SGAI	-21.392	Eights
INF	-12.526	Ninth
GDP	-1.569	Twelve
EX	-12.339	Tenth
GROW	3.675	Eleventh

According to Table 10, the fitted vector machine model, the regression coefficients estimated, and the estimated fraud model are as follows:

$$MScore1 = -41.670SGI - 21.392SGAI - 26.985TATA + 43.513GMI - 43.964DSRI$$
$$- 34.794LVGI + 35.329DSRI - 12.339EX + 39.315AQI - 12.526INF$$
$$- 12.339GROW - 1.569GD$$

Accuracy of the model presented in Table 11:

Table 11. The Accuracy of Vector Machine Model

Beneish model	Accuracy
0	24 %
1	99.91 %
Total	93.62 %

The accuracy of the Vector Machine Method is 93.62 percent.

4.3.1. Developed Beneish –Neural Network Model
As shown in Table 12, 70.1% of the data equivalent to 846 were used as training samples, and 29.9% of the data equivalent to 360 was used as testing samples.

Table 12. Assigning the number of samples

		N	Percent
Sample	Training	846	70.1%
	Testing	360	29.9%
Valid		1206	100.0%
Excluded		45	
Total		1251	

According to table 13, The amount of error obtained from the fit of this model is equal to 23.347 in the training sample, and the amount of error obtained in the testing sample is equal to 12.474. Since the amount of error obtained in the testing sample is less than in the training sample, the model fit is acceptable.

Table 13. The model fit error samples

Training	23.347
Testing	12.474

The effect of independent variables on entering the model is as Table 14:

Table 14. The Neural network model variables

Variables	Coefficient	Priority
DSRI	0.141	Fourth
GMI	0.145	Second
AQI	0.050	Eights
SGI	0.144	Third
DEPI	0.170	First
SGAI	0.084	Sixth
TATA	0.070	Seventh
LVGI	0.103	Fifth
INF	0.013	Twelve
GDP	0.022	Tenth
EX	0.019	Eleventh
GROW	0.040	Ninth

According to table 14, the fitted random forest model, the regression coefficients are shown in the Table, and the developed model is as follows:

$$MScore1 = 0.144 SGI + 0.084 SGAI + 0.070 TATA + 0.145 GMI + 0.141 DSRI + 0.103 LVGI \\ + 0.170 DEPI + 0.019 EX + 0.050 AQI + 0.013 INF + 0.040 GROW + 0.022 GDP$$

Accuracy of the model presented in table 15: **Testing   Training**

Table 15. The Accuracy of Neural network

Testing	Accuracy	Training	Accuracy
0	59%	0	63.6 %
1	99.9 %	1	98.2 %
Total	96.1 %	Total	96.1 %

As shown in table 15, the accuracy of the Neural network method is 96.1 percent.

4.3.2. Developed Beneish –Random Forest Model

Table 16 uses the random forest method to detect fraud using significant independent variables and prioritize how they are entered.

Table 16. The random forest coefficients

Variable	Coefficient
DEPI	50.914
DSRI	32.873
TATA	17.606
SGI	17.236
SGAI	13.674
GMI	11.516
LVGI	9.033
EX	8.169
AQI	7.794
INF	7.691
GROW	2.916
GDP	1.936

According to Table 16, the fitted random forest model, the regression coefficients estimated in the table, and the estimated model of fraud detection are as follows:

$$MScore1 = 17.236SGI + 13.674SGAI + 17.606TATA + 11.516GMI + 32.873DSRI$$
$$+ 9.033LVGI + 59.914DEPI + 8.169EX + 7.794AQI + 7.691INF$$
$$+ 2.916GROW + 1.936GDP$$

Table 17. The Accuracy of random forest Model

Beneish Model	Accuracy
0	62 percent
1	99.98 percent
Total	99.96 percent

According to Table 17, the accuracy of the random forest method is 99.96 percent.

4.4. Comparison between Beneish model and developed Beneish
A comparison between the Beneish model and the developed Beneish is shown in table 18.

Table 18. The Comparison between the Beneish model and the developed Beneish

Model	Neural Network	Random Forest	Vector Machine
Beneish	93.7	99.96	93.03
Developed Beneish	96.1	99.96	93.62

According to Table 18, the developed Beneish model with neural network method, random forest, and vector machine has more accuracy than the Beneish model.

5. Conclusions
Given that there is no other source for predicting fraud in the Iranian environment other than financial statements, this study uses the variables of financial statements and develops the Beneish model using audit variables to investigate possible potential fraud. Predicting fraud is how investment opportunities can be properly applied to maximize firm value. Second, the investor can distinguish favorable investment opportunities from unfavorable ones, in which forecasting models show their

importance. According to the issues above, the present study seeks to answer whether the Beneish model has been completely successful in identifying fraud in Iranian companies and whether it is possible to improve the model by adding variables. To achieve the objectives of the research and to answer the research questions, after calculating the descriptive statistics of the identified indicators such as mean, and standard deviation, the Beneish model for predicting fraud detection, was developed by 3 neural networks (96.1% accuracy), random forest (99.96% accuracy) and vector machine (93.61% accuracy). In addition, the developed model with neural network method, random forest, and vector machine is more accurate than the basic Beneish model. Finally, considering that the research results show that economic variables can improve the strength of the financial statements fraud model, it is recommended that investors and capital market participants pay attention in their analysis of financial statement fraud to economic variables. Financial analysts and investors may be aware that financial statements may be misleading during economic factors fluctuations. Lawmakers can pay attention to economic fluctuation to improve capital market laws. In addition, because the accuracy of the fitted random forest model is higher than other models, it is suggested that the coefficients obtained from this model be used to investigate fraud in financial statements. Finally, it is suggested that future researchers consider other factors in developing fraud prediction using other fitting models.

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RESEARCH ARTICLE

Auditor Management by the Client using the Omissions and Auditor's Assessment of the Misstatements Detection: Bait for the Auditor Management

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Abstract

One of the strategies of audited firms' management is to divert the auditor's attention from the managed accounts to clean accounts (without misstatement) or accounts that contain misstatements other than managed accounts to affect the auditor's ability to detect fraud. The experimental method and a sample include 106 auditors in 2022. We examine whether managers attempt to reduce the perceived intentionality of their fraudulent misstatements by perpetrating fraud via omission, as opposed to a more active form of commission, and how auditors evaluate the resulting misstatements. We find that managers choose to omit a transaction from the financial statements rather than record a transaction inappropriately. They also decide to omit critical information from supporting documents rather than provide misleading information. However, auditors generally believe that misstatements involving omissions are unintentional. Specifically, we find that auditors are less skeptical of an omitted transaction than a misrecorded transaction. They are also less skeptical of a misstatement that results from management omitting information from a supporting document than misrepresenting information. Finally, a method of fraud (omission) is identified that those managers are likely to use; on the other hand, those auditors are unlikely to judge it as intentional.

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1. Introduction

Several researchers and professional fraud examiners have emphasized the need for the early detection of fraud. Though there are many ways in which frauds can be detected, a particularly effective and inexpensive way is to identify fraudsters by scrutinizing personnel behaviour for peculiarities typical of fraudsters (Sandhu, 2022). Managers are trying to hide accounts manipulation because if the manipulations made for earnings manipulation and followingly earnings management become apparent, they will no longer benefit management (Dechow et al., 2012). Therefore, the managers try to prevent auditors from detecting managed (manipulated) accounts (Petty and Cacioppo, 1986). This aspect of management behavior is called auditor management. Auditor management covers a wide range of methods; one of the most important ones is distraction and baiting. This study tries to determine whether auditors will detect misstatements in managed accounts using the client's management's document manipulation (baiting and deflection) techniques. The important aspect from the auditors' viewpoint is that their interests are associated with fraudulent actions that cause significant misstatements in the financial statements (Moradi, Rostami and Zare 2014). Managers may divert auditors' attention to accounts that are considered free of misstatements and distortions, which are called clean accounts, or they may divert auditors' attention to distorted accounts (to be more exact, these distortions do not affect earnings, on the other hand, only have been generated from earned management accounts to mislead, or to divert auditors' attention) (Luippold et al., 2015).

There are two primary methods by which an intentional misstatement can be achieved: "misrepresentation or intentional omission from the financial statements" (PCAOB, 2002b). That is, when committing fraud, a client manager can either choose to *actively* misrepresent, alter, and/or falsify information contained within the financial statements and supporting documents (e.g., record a fictitious sale or capitalize a valid expense) or omit, through *inaction*, a necessary transaction or piece of information (e.g., fail to record an incurred expense or valid sales return). Archival evidence suggests that most frauds are perpetrated via active forms of misrepresentation, such as recording fictitious sales and recognizing revenues prematurely, while far fewer frauds are perpetrated by omitting necessary transactions (e.g., omitting expenses and liabilities) (Dechow et al., 2011; Beasley et al., 2010). However, this characterization of fraud seems inconsistent with psychology theory, which indicates that individuals prefer to bring about morally objectionable outcomes via omission (i.e., inaction) as opposed to commission (i.e., action) (Ritov and Baron 1999; Baron and Ritov 2004; DeScioli, Bruening and Kurzban 2011b).[2] In this paper, we examine whether financial reporting managers perpetrate fraud using an "omission strategy" (DeScioli, Bruening and Kurzban 2011b). We also examine auditors' perceptions of misstatements resulting from omission compared to a more active form of commission. Theory from psychology suggests auditors may be inclined to believe a misstatement resulting from omission is unintentional (i.e., due to error rather than fraud) (Spranca, Minsk and Baron 1991). This study is unique because human behavior as a possible fraud indicator is an under-researched area, and Implications for anti-fraud practitioners are discussed. In the following, the framework of theoretical foundations and the development of hypotheses and research method, findings and conclusions are reviewed.

2. Background and Hypothesis Development

Auditor management is considered a client strategy in which the manager uses various techniques to reduce the likelihood of discovering the accounts that are regarded as managed by auditors. Auditor management can include a variety of methods; For example, managers may provide evidence to auditors in a way that manipulates the risk of audit (Jamal, Johnson and Berryman 1996), or they may provide incomplete or incorrect information to conceal auditors' questionable accounting practices;

while this research refers to baiting techniques for auditors management. Some research has been conducted on manipulating management information to manage auditors. These studies include the provision of incomplete information and the presentation of evidence. Managers may also divert auditors' attention to other areas to prevent the discovery of earnings management.

Hamilton and Smith (2021) showed that managers prefer to remove a transaction from the financial statements instead of recording a transaction improperly. Managers also remove important information from supporting documents instead of providing misleading information. However, auditors generally believe that misstatements include removing unwanted items, and auditors are less skeptical of a deleted transaction than of a recorded incorrect transaction. They are also less sure about the misrepresentation of information than of misrepresentation resulting from removing document information from backup documents. Caramanis and Lennox (2008) concluded that if client management could divert auditors to other areas through baiting techniques, it would lead to more working hours in those areas and, as a result, less time to review other sites. Consequently, this matter gives earnings management an opportunity for client management. As a result, auditor management will be a fertile ground for future research. The focus of this study will be on distracting auditors, While research on auditor management is limited.

Psychological research on distracting peoples' attention suggests that distraction reduces efficiency (Freudenburg and Alario, 2007). In their paper, Freudenburg and Alario (2007) examined several currents in the legitimacy literature. They found that the disappearance of evidence from an issue could be effective in the eyes of individuals. In this way, the magicians' trick is effective when their trick is hidden from the eyes of the people. They do this by directing people's attention or keeping their eyes away from body movements; So that their tricks remain unseen. Also, a negotiator wins when the evidence for his/her position remains unknown. Research on convincing suggests that distraction makes people more likely to agree with others; distraction has a detrimental effect on perception (Petty and Cacioppo, 1986; Baron, Baron and Miller, 1973). Researches into the details of the probability expansion model (to shape individuals' attitudes) show that distracting individuals makes the cognitive process much more difficult; Because this leads to more secondary information processing (Petty and Cacioppo, 1986; Street et al., 2001). The probability expansion model states that attitudes can be formed through two processes: central attitude or external and lateral attitude. The central approach involves careful thinking and analysis of all the details. Lateral attitude involves the superficial processing and reliance on the peripheral characteristics of a message; For example, some may agree with a message just because it was transmitted from a trusted source, regardless of the content of the message; For example, limited and stressful time budgets make auditing operations ineffective due to the impossibility of detecting significant distortions and also reduce operational efficiency in terms of time and personnel costs. Also, if it distracts people beyond the capacity of their analytical power, decision-making and judgment will be disrupted (Behzadian and Izadi Nia, 2018); it places a lot of pressure on auditors' minds regarding their self-control. This issue can influence auditors' judgment and decision-making (Daryaei and Kholousi Moshfegh, 2020).

As well as that, researches into the effects of information tracking, either in psychology or in accounting, suggest that the effect of deviance on the performance of professional auditors may both hinder and enhance the performance of auditors; As a result, searching for a predetermined part to obtain information increases people's reaction to the information they have found (Baron, Baron and Miller, 1973). This increases people's reaction to the information obtained in the predefined sections, called the information tracking effect. Several scenarios may occur when auditor attention is diverted to other accounts:

1. The auditor's mind and time are occupied with reviewing that account, and they may not, in the end, spend the proper time and carefully reviewing the other accounts.

2. If auditors deviate from clean accounts, they may feel that other accounts are necessarily free of material misstatement and reduce the scope of their review.

3. If auditors deviate from distorted accounts (distortions that are for tracking and do not include earned management accounts), they may feel satisfied after discovering that misstatements or distortion and think that they have done their job and ignore other accounts and, as a result, accounts that have been managed remain undiscovered.

4. According to information tracking theories and professional skepticism, auditors may expand their searches questioningly when they deviate to erroneous accounts and eventually discover management accounts. Those managers choose to perpetrate fraud through omission rather than commission—an important related question is whether auditors are less skeptical of misstatements resulting from omission than commission. While most of the audit literature related to fraud detection has examined auditors' fraud-related audit planning judgments (Wilks and Zimbelman 2004; Carpenter 2007; Hoffman and Zimbelman 2009; Hammersley; 2011, for a review of the fraud planning literature), it cannot be assumed that once a fraudulent misstatement is identified, it will be accurately evaluated as fraudulent. Psychology research provides evidence that third-party observers often are susceptible to an "omission bias" wherein they perceive omissions as less intentional and less blameworthy than acts of commission (Anderson 2003; Cushman, Young and Hauser 2006; DeScioli, Bruening and Kurzban 2011b). Importantly, omissions are judged less harshly, even when omission and commission result in identical outcomes (Spranca, Minsk and Baron 1991; Kordes-de Vaal, 1996).[21] Omissions are less intentional because they do not indicate a choice, making the actor's intentions unclear (Kordes-de Vaal 1996; DeScioli, Christner and Kurzban 2011a). Therefore, it is unclear whether inaction was chosen or resulted from unawareness that action was needed. If a manager fails to record a sales return, it is unclear whether the manager intended to overstate revenues or simply forgot to record the transaction. In contrast, a manager who records revenue prematurely took an observable and inappropriate action, making it appear more intentional.

Accordingly, we proposed that auditors will judge identified misstatements as less likely to be intentional when they result from omission compared to a more active form of commission. Specifically, we proposed that auditors will judge a misstatement as less likely to be intentional when it relates to a transaction that was improperly omitted from the financial statements compared to a transaction recorded inappropriately. Auditors will judge an identified misstatement as less likely to be intentional when it involves an omitted transaction than a misrecorded transaction. Thus, the first hypothesis is:

H1: In the face of distorted financial statements using the omission strategy, auditors consider that the identified misstatements are unintentional.

When a misstatement is identified, auditors typically review supporting documents associated with the transaction (e.g., sales order forms, invoices, contracts). Such supporting audit evidence can provide auditors with information about the misstatement and the client's actions (or inaction) that led to the misstatement. According to auditing standards, fraud may be concealed by withholding evidence or misrepresenting information (PCAOB 2002b). The omission bias may also be relevant to how auditors perceive inaccuracies in the audit evidence underlying an identified misstatement. Specifically, we expect auditors will judge a misstatement as less likely to be intentional when a supporting document *omits* relevant information than when the document contains information that *misrepresents* the nature of the transaction. Auditors will judge an identified misstatement as less likely to be intentional when it results from an omission of relevant information from a supporting document compared to a misrepresentation of relevant information. Thus, the second hypothesis is:

H2: In the face of distorted financial statements using the manipulation strategy, auditors consider that the identified misstatements are intentional.

According to Miller, Zweben and Johnson (2005), values are social models that a group of people accepts. Going through details provides a basis for creating common expectations and guiding and regulating behavior, depending on people's acceptance. According to Rokeach (1973), value belief is relative stability on which a person prefers a particular behavior to another behavior (Freudenburg and Alario, 2007). Value is a complex concept that can be divided into individual or personal, collective and cultural values. Schwartz (1994) has defined value as desirable goals, each of which is of different importance and is used as guiding principles in people's lives (Schwartz, 1992). Personal values describe individual and social classifications (Schwartz, 2006), explore value-based relationships and fundamental variables, and predict individuals' attitudes and daily behaviors (Schwartz, 1994). When we talk about values, we talk about what is essential in people's lives. Each person has different values with different degrees of importance. Values vary from person to person (Schwartz, 2006), and some studies point to the effect of personal values on decision making and judgment (Mashlah, 2015).

Values influence decisions, attitudes and behaviors; Therefore, the roots of auditor judgments can be traced to values. Mashlah (2015) believes values influence attitudes, behaviors, decisions, motivations and ethics. Professional judgment is critical in auditing, affecting the whole audit process. Making sound professional judgments is an essential factor in performing the duties of an auditor, and increasing the skill of judging is essential for auditors (Khoshtinat and Bostanian, 2007). Therefore, in the current situation, one of the complexities of accounting and auditing that needs to be considered is the personality characteristics of judges, which are not mentioned in any standard book; Because judgment is present in the whole process of audit operations. According to paragraph 16 of Standard 200 of the Iranian Audit, the auditor must use professional judgment in the planning and execution of the audit of the financial statements. Therefore, the need to pay attention to the values of the person influencing the attitude and behavior of auditors and, ultimately, the auditors' judgment is important. Also, by influencing the behavior and attitude of auditors, personal values can have a major impact on the decision-making and judgment of auditors in the entire audit process, including detecting distortions in the financial statements. People try to behave in a way that is consistent with their values. Therefore, the third hypothesis is:

H3: Auditors with personality characters of idealism (or moral idealism) are more capable of detecting fraud than pessimistic auditors.

Rahmawati and Indrijawati (2020) examined the effect of auditor experience, work, and doubt personality professions on auditors' ability to detect fraud. Respondents in the study included KAP auditors in the Jakarta, Surabaya and Makassar regions with purposive sampling techniques. Distributing questionnaires to the respondents was the data collection method used in this study. Additionally, multiple linear regression analysis was used for the data analysis method. This research is very useful for auditors in order to detect fraud. To explain more, the results showed that audit experience variables, workload, and professional skepticism positively affected the auditor's ability to detect fraud. In contrast, personality variables did not influence the auditor's ability to detect fraud.

Pratoomsuwan and Yolrabil (2020) examined a preliminary understanding of how fraud and undetected errors affected auditor responsibility. This study provided a preliminary understanding of how undetected fraud and error misstatements affected auditor liability, given the same outcome

severity. A 2x2 between-subject experiment was conducted using undergraduate accounting students to represent evaluators who had high levels of auditing knowledge and nonaccounting students to represent evaluators with low levels of auditing knowledge. The experiment results indicated that evaluators with high auditing knowledge assessed auditors as less liable in cases of undetected misstatements due to fraud rather than an error. In contrast, less knowledgeable evaluators rated auditors as more liable in such cases. The findings of this study provided some insights that benefited the audit profession, standard setters and the Security and Exchange Commission regarding the auditor's responsibility related to fraud. This proved that other misstatements (fraud and error) helped reduce differences in auditor liability judgments, mainly when evaluators evaluated misstatements with different levels of auditing knowledge. This finding also suggests that the auditor litigation risk created by the expectation gap will remain despite any attempt to minimize it. Widodo and Chariri (2021) examined the relationship between auditing procedures, auditors' experience, and auditors' responsibility for detecting fraud. Auditors' responsibility for fraud detection acted as the dependent variable, whereas the independent variables were audit procedures and auditors' experience. The control variables of the study were gender and position. Empirical test results were obtained from auditors working at fourteen public accounting firms in Indonesia. The findings showed that the audit procedures and auditors' experience positively influenced the auditors' responsibility for fraud detection. This study contributed to auditing and accounting literature, precisely the fraud detection method used to increase the awareness of fraud risk. Verwey and Asare (2022) examined the combined effect of ethical idealism and pessimism on auditors' fraudulent judgments. The results highlighted the importance of measuring and controlling for the effects of these traits when evaluating fraud detection performance. The paper also showed that an ethics theory could generate additional understanding and insights into an important accounting phenomenon.

Hamilton and Smith (2021) investigated the effect of management fraud strategies on auditors' judgments of identified distortions. The experiment results showed auditors were less skeptical of an omitted transaction than a misrecorded transaction. They were also less doubtful about a misstatement of information compared to misrepresenting information. Finally, a method of fraud was identified that managers were likely to use, but auditors were unlikely to judge it as intentional.

3. Research Methodology

This research is a descriptive-correlation study conducted to investigate the auditor management by the client using the omissions and auditor's assessment of the misstatements detection. Univariate analysis of variance (ANOVA) and one sample (T-Test) were used to test the hypotheses. The Levin test was used in the ANOVA univariate analysis of variance to evaluate the homogeneity of variance of groups. If the significance level of the Levin test is higher than 0.05, it indicates homogeneity of variance. Data were collected using a questionnaire. The standard questionnaire was designed based on the Likert scale. To test the first and second hypotheses, Hamilton and Smith's (2021) research scenario and to examine the third hypothesis, Verwey and Asare's (2021) research questionnaire has been used. Finally, in order to ensure the validity of the scenario and the questionnaire, before the final distribution among the sample members, the scenarios and questionnaires were reviewed by a number of auditors working in the audit organization and audit firms and their opinions were applied. Scenario 1 assesses the auditor's judgment in the face of distorted financial statements using an omissions strategy. Scenario 2 assesses the auditor's judgment in the face of distorted financial statements using a strategy of manipulating evidence (Hamilton and Smith, 2021). In the end, the auditor is asked questions about the auditor's personal values (idealism or moral idealism and pessimism). Managers try to hide earnings manipulation. Because if the manipulations made for fraud are revealed, it will no longer benefit the management. Therefore, the manager is trying to prevent

the auditors from discovering the tampered accounts. This aspect of earnings manipulation is called auditor management. Auditor management covers a wide range of methods; one of the most important ones is distraction and baiting. The question is whether auditors will detect misstatements in earnings management accounts when using earnings manipulation techniques (baiting and deflection) by the client's management. The important aspect from the auditor's point of view is that their interests are intertwined with fraudulent acts that cause significant misstatements in the financial statements. Managers may divert auditor attention to accounts free of misstatements and distortions, called clean accounts, or they may divert auditor attention to distorted accounts (distortions that do not affect earnings, only to mislead or to divert). Auditor attention is generated from earnings manipulation accounts. So, everyone has a set of personal values that influence their day-to-day decisions, as these values play an essential role in decision making, preferences, perceptions and even emotions. These values may vary from person to person. Therefore, personal values influencing the behavior and attitude of auditors can significantly affect the decision and judgment of auditors in the entire audit process, including detecting distortions in the financial statements. Personal values profoundly affect people's performance, sense of satisfaction, and way of thinking. Thus, each individual may react differently when placed in different situations, and using a particular technique may lead to different outcomes depending on the characteristics of the individual. Personal values and their extent differ in all individuals, and individuals make decisions and judgments according to their values. Therefore, in addition to examining the effect of the baiting technique on auditor performance, it is necessary to examine their personal values to understand the roots of this issue better. The reason is that in addition to baiting techniques, personal values also affect performance and, ultimately, the judgment and detection of fraud. In the present study, following the research of Verwey and Asare (2022), idealism or moral idealism and pessimism have been used as personal values for the auditor.

Finally, they were analyzed using SPSS software after collecting the required data. As a result, Cronbach's alpha was used to measure the reliability of the questionnaire. Content validity was used in this study. Experts' and experienced professors' viewpoints were used to assessing the questionnaire's validity. Cronbach's alpha was used to assess the reliability of the questionnaire, which was 0/88. As a result, since Cronbach's alpha value was greater than 0/70, the questions of the research questionnaire had good reliability.

The statistical population of this study is considered all auditors (senior auditors, supervisors and senior supervisors) working in auditing firms who are members of the Iranian Society of Certified Public Accountants and Audit Organization in 2022. Due to the infinity of the statistical community, without the placement of the infinite community, the scenarios are distributed among the members of the available statistical community. A random sampling test without placement of unlimited community is used for sampling. Since it was not possible to study the whole community, available sampling was used. The available statistical population includes 106 auditors. The results of descriptive statistics of research participants in terms of gender, age, education, experience and their position showed that 85% of male and 15% of female auditors, 78.3% of auditors, 11.7% of auditing and 10% of management (Economy = 0), the age of 20% of auditors is between 20-30 years and 35% between 40-40, 30% between 40-50 and 11.7% between 50-60 and 3.3% over 60. Audit history is 50% between 1-10 years, 26.7% between 11-20 years, 15% between 21-30 years and 8.3% above 30. 13.3% have a bachelor's degree, 70% have a master's degree, and 16.7% have a doctorate. 16.7% are partners, 20% are audit managers, 16.7% are supervisors, 25% are senior auditors, and 21.7% are auditors. 86.7% are employed in auditing firms, and 13.3% are employed in auditing organizations.

4. Research Findings

In this study, we examine whether auditors are less skeptical of misstatements that result from omission compared to a more active form of commission. Through a series of experiments, we examine two methods by which omissions could be used to perpetrate and conceal fraud: (1) by omitting a transaction from the financial statements and (2) by omitting information from a supporting document. Tables (1) to (8) present the average of each auditor's judgments. The auditor's judgment in the face of the client's strategies ((1) by omitting a *transaction* from the financial statements and (2) by omitting *information* from a supporting document) is presented below.

Table 1. One-Sample Statistics for Omission Strategy

	N	Mean	Std. Deviation	Std. Error Mean
Scenario 1	106	2.700	1.565	0.202

The mean of participants in scenario 1 is 2/7, and the evidence shows that 33% were completely unintentional, 22% somewhat unintentional, 22% somewhat intentional, 18% completely intentional, and 5% theoretical.

Table 2. One-Sample Test for Omission Strategy

					Test Value = 0	
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Scenario 1	13.359	105	0.000	2.700	2.295	3.104

The significance for scenario 1 is equal to 0. The results showed that in the face of distorted financial statements using the strategy of omission, auditors consider that the identified misstatements are unintentional.

Table 3. One-Sample Statistics for Manipulating Evidence Strategy

	N	Mean	Std. Deviation	Std. Error Mean
Scenario 2	106	3.966	1.261	0.162

The mean of participants in scenario 1 is 3/96, and the evidence shows that 48% were completely unintentional, 23% were somewhat intentional, 13% were unintentional, 10% had no opinion, and 5% were completely unintentional.

Table 4. One-Sample Test for Manipulating Evidence Strategy

					Test Value = 0	
	T	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Scenario 2	24.351	105	0.000	3.966	3.640	4.292

The significance for scenario 1 is equal to 0. The results of Table (4) showed that auditors consider that the identified misstatements are intentional in the face of distorted financial statements using the strategy of manipulating evidence. In this study, managers choose to perpetrate fraud by omitting an expense transaction rather than misrecording a revenue transaction. Managers also commit fraud by omitting relevant information from a supporting document rather than misrepresenting the nature of the transaction. As well as that, in this study, we find that auditors judge a misstatement as less likely to be intentional when it involves omission (i.e., an omitted expense transaction or information omitted from a supporting document) compared to a more active form of manipulation. Taken together, these results suggest the methods of fraud likely to be chosen by managers are also the methods auditors are unlikely to judge as fraudulent.

The auditor's judgment in the face of the client's strategies (1) by omitting a *transaction* from the financial statements and (2) by omitting *information* from a supporting document) Among auditors with ethical values (idealism or moral idealism and pessimism) are presented below.

Table 5. ANOVA for Idealism in the Omission Strategy

Scenario 1					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	43.807	7	6.258	3.229	0.006
Within Groups	100.793	98	1.938		
Total	144.600	105			

Table (5) shows the results for idealist auditors whose clients have used the omission strategy.**Table 6.** ANOVA for Pessimism in the Omission Strategy

Scenario 1					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	24.724	6	3.090	1.315	0.258
Within Groups	119.876	99	2.351		
Total	144.600	105			

Table (6) shows the results for pessimist auditors whose clients have used the omission strategy. The significance in the ANOVA test for idealism in the omission strategy is equal to 0.006. Still, the significance of the ANOVA test for pessimism in the omission strategy is equal to 0.258. The results show that auditors with personality Characters of idealism or moral idealism are more capable of detecting fraud in the omission strategy than pessimistic auditors.

Table 7. ANOVA for Idealism in the Manipulating Evidence Strategy

Scenario 2					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	35.361	10	4.420	3.849	0.001
Within Groups	58.573	95	1.148		
Total	93.933	105			

Table (7) shows the results for idealist auditors whose clients have used the manipulating evidence strategy.

Table 8. ANOVA for Pessimism in the Manipulating Evidence Strategy

Scenario 2					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	23.402	9	3.343	1.465	0. 290
Within Groups	70.531	96	1.356		
Total	93.933	105			

Table (8) shows the results for pessimist auditors whose clients have used the manipulating evidence strategy. The significance of the ANOVA test for idealism in the omission strategy is 0.001. Still, the significance of the ANOVA test for pessimism in the omission strategy is equal to 0.290. The results show that auditors with personality characteristics of idealism or moral idealism are more capable of detecting fraud in manipulating evidence than pessimistic auditors. As a result, the third hypothesis is not rejected, and Auditors with personality characteristics of idealism or moral idealism are more capable of detecting fraud than pessimistic auditors.

5. Discussion and Conclusions

To detect fraudulent financial reporting, auditors not only must identify a misstatement but also correctly conclude (initially or following additional investigation) that the misstatement resulted from an intentional act. Therefore, auditors must be able to judge the likelihood that an identified misstatement was caused intentionally effectively. Unfortunately, this ability may be compromised if managers strategically choose methods of perpetrating fraud that appear less intentional on the surface. The issue of confusing or distracting auditors reduces the effectiveness of auditors. Therefore, auditors need to be careful that management does not distract them. Many psychological types of research have been done on the effect of attention deficit, information pursuit, the mental capacity of individuals, and personal values' effect on people's judgment. But a few types of research have been done on the relationship between deviation and auditor attention as a baiting strategy to conceal earnings management accounts.

Since the omitted transaction is always an expense and the misrecorded transaction is always considered a revenue, we conduct a study with auditor participants that disentangles the relative effects of the (in)action that caused the misstatement (omitted versus misrecorded transaction) and

the account involved (expense versus revenue). Consistent with previous results, auditors exhibit reduced skepticism in response to omitted transactions compared to misrecorded transactions. Accordingly, the first hypothesis of the research is confirmed. In the face of distorted financial statements using the strategy of omission, auditors consider that the identified misstatements are unintentional. The result of the first hypothesis is consistent with Hamilton and Smith's (2021) research. While the nature of this reduced skepticism differs based on the account involved (revenue or expense), in all instances, auditors respond less sceptically to misstatements resulting from omission. Based on this, the second hypothesis of the research is confirmed. In the face of distorted financial statements using the strategy of manipulating evidence, auditors consider that the identified misstatements are intentional. The result of the second hypothesis is consistent with the research of Hamilton and Smith (2021). Our study contributes to the literature on fraudulent financial reporting and its detection by auditors. While prior research demonstrates that managers attempt to conceal their fraudulent misstatements (Zimbelman and Waller 1999; Bowlin 2011), our study suggests managers also try to conceal their fraudulent intentions by perpetrating fraud in ways that appear less intentional the resulting misstatement becomes identified. Similarly, the audit literature on fraud detection has primarily focused on auditors' ability to identify fraudulent misstatements (e.g., via fraud risk assessments and planning procedures) (Wilks and Zimbelman 2004; Carpenter 2007). However, it cannot be assumed that once a misstatement is identified, it will be accurately evaluated as fraudulent. Therefore, we extend the audit literature by examining factors that influence auditors' evaluations of identified misstatements-specifically, factors that cause a misstatement to be perceived as more or less intentional. Our research findings should also be of interest to audit practitioners and regulators. While auditing standards require auditors to consider whether identified misstatements may have been caused intentionally (PCAOB, 2010), little evidence exists regarding the effectiveness of these evaluations. Our study suggests that when managers use an omission strategy, auditors are inclined to dismiss the resulting misstatements as unintentional. As such, auditors would benefit from additional education and training that increases their awareness of this fraud strategy and encourages them to be more skeptical of misstatements characterized by omission.

Thus our findings that managers choose to perpetrate fraud by omitting expense transactions may seem inconsistent with archival fraud data that suggest most frauds involve the improper recording of revenues. However, our auditor studies' results can help explain this apparent inconsistency. Specifically, our studies suggest that in addition to misrecording revenues, managers may also be perpetrating fraud by omitting expenses. Still, fewer of these omissions are identified as fraudulent since auditors are more likely to dismiss omissions as unintentional errors. It is also worth noting that we find evidence that auditors are less skeptical of expense misstatements than revenue misstatements. This may further help to explain why most identified frauds involve revenues that were recorded inappropriately, while far fewer involve omitted expenses-namely; auditors may believe certain misstatements (e.g., those involving omissions and/or expenses) are unlikely to be fraudulent. More research is needed to understand the extent to which managers are perpetrating a fraud—and successfully concealing it (e.g., from auditors, jurors, and regulators)—via methods that appear unintentional on the surface.

The third hypothesis addresses the issue that auditors with personality characters of idealism or moral idealism are more capable of detecting fraud than pessimistic auditors. Although regulators have identified ethical lapses as a key factor contributing to auditors' failure to detect their clients' fraudulent financial reporting (fraud), research using ethical theory to examine auditors' fraud detection remains limited. We provide evidence on the joint effect of ethical idealism and trait skepticism on auditors' fraud judgments. Ethical idealism reflects an individual's concern for the welfare of others, while trait skepticism reflects an individual's disposition to validate a proposition.

Forsyth and O'Boyle (2013) theorized that there was an association between ethical idealism and tolerance for deception. Drawing on that insight, we posit that ethical idealism and trait skepticism have a complementary effect on auditor fraud planning performance. This is rooted in the former determining an auditor's tolerance for allowing a client to get away with an ethically questionable act. At the same time, the latter is essential in determining how evidence is generally sought and evaluated. Our results indicate a significant positive association between trait skepticism and the number of effective audit procedures but only for auditors with high ethical idealism. The results highlight the importance of measuring and controlling for the effects of these characters when evaluating fraud detection performance. The paper also shows that an ethics theory can generate additional understanding and insights into a vital accounting phenomenon. The result of the third hypothesis is consistent with Verwey and Asare's (2022) research.

Our study is subject to inherent limitations that should be considered when evaluating these findings. While we find that managers choose to perpetrate fraud by omitting expenses as opposed to misrecording revenues, we are unable to determine whether this choice is driven more by the account involved (expense versus revenue) or the (in)action required (omitting verses misrecording a transaction). Future research is needed to separate these effects and better understand how managers perpetrate fraud to make the resulting misstatements appear less intentional.

Additionally, assume the auditors have already detected the misstatement. Therefore, our studies cannot determine whether a misstatement characterized by omission or commission is more likely to be detected in the first place. We find evidence that managers believe omissions are less likely to be detected, but additional research is needed to test whether this is, in fact, the case. If omissions are both (1) less likely to be detected and (2) less likely to be judged intentional if detected, the implications of the omission strategy may be more pronounced than our study suggests.

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RESEARCH ARTICLE

The Tone of Market Participants' Opinions via Social Media and Capital Market Reaction

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ARTICLE INFO	Abstract
  	The present study intends to test and analyze the tone of market participants' opinions via social media and capital market reaction. We use a sample of 345 firm data from the list of S&P 500 firms and analyze it using *Stata* software. The results showed no significant relationship between the tone of earnings tweets and market variables. However, the results of separating the tweets into the original earnings tweets and existing earnings tweets indicated a significant relationship between the tone of the initial earnings tweets and abnormal share turnover. Findings also suggest a significant relationship exists between the tone of existing earnings tweets and bid-ask spreads. Further analysis based on separating tweets into positive and negative demonstrated a meaningful relationship between the tone of positive and negative tweets and abnormal stock turnover and spreads. The results confirm that Twitter can provide complementary awareness in capital markets.

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1. Introduction

Following the efficient market theory, the securities prices represent the information available. However, the information gap between investors causes information asymmetry and affects capital market efficiency. Many studies find that public disclosure reduces information asymmetry (Beyer et al., 2010). However, to the extent these disclosures are not disseminated to a broad set of investors, information asymmetry may still exist among investors (Blankespoor, Miller and White, 2014). To disseminate information, firms have generally relied on information intermediaries, such as the press. However, the press is biased coverage of high visibility firms because they tend to draw the largest readership base (Miller 2006). Investors also have long relied on information intermediaries (e.g., financial analysts, financial advisors, the business press, credit rating agencies, short sellers, and auditors) to acquire timely and value-relevant information regarding the prospects of stocks. Investors have limited time and resources and tend to rely on only a few sources for their information (Beyer et al., 2010). The past decade has witnessed an explosion in new sources of information that are easily accessible to capital market participants. However, the biggest revolution in disseminating information on the Internet has been the advent of social media platforms such as Twitter, which allow users to post their views instantaneously about stocks to a wide audience (Bartov, Faurel and Mohanram, 2019). In April 2013, the Securities and Exchanges Commission (SEC) issued a new regulation permitting firms to use social media to communicate financial information to investors (SEC, 2013). This new regulation by the SEC was in response to the rise of corporate use of social media to communicate financial information. Because of the rise of Twitter discussions about the stock market, Twitter introduced the "*cashtag*" symbol ($) in 2012. The *cashtag* is used to identify those tweets that specifically discuss a firm's stock and is thus how I identify tweets that pertain to the stocks of specific firms. In other words, market participants can express their opinions about a firm's stock through the symbol of *cashtag* ($).Accordingly, Twitter allows investors to access information in two ways. First, they can follow information directly from firms in which they are interested. Second, the aggregation of Twitter financial discussions about stocks captures the crowd's wisdom and is thus a useful source of financial information (Al Guindy, 2017). Twitter allows users to tap into the Wisdom of Crowds, where the aggregation of information provided by many (non-expert) individuals often predicts outcomes more precisely than experts. Further, Twitter users, who come from diverse backgrounds, are less likely to herd, a phenomenon that plagues traditional information intermediaries (e.g., financial analysts), as well as social media platforms (e.g., blogs, investing portals) where a central piece of information is posted and the users, comment on it. Also, Twitter's short format (up to 140 characters) and ease of information search (e.g., the use of cashtags) make it an ideal medium to share opinions and information in a timely fashion, in contrast to the longer format and potentially reduced timeliness of research reports or articles (Bartov, Faurel and Mohanram, 2019). Finally, most tweeting originating from firms is positive in tone – as expected by theories of selective disclosure in Verrecchia (1983) and Jung and Kwon (1988). On the other hand, Tweeting from market participants exhibits a more varied tone since it carries the crowd's opinions, not those of the firm. Accordingly, the question is whether the unique features of Twitter can improve the information content of firms and affect capital market variables. The academic literature has begun studying the role Twitter plays in the capital market only recently, perhaps because Twitter

was created in March 2006 and launched in July 2006. One strand of this literature examines how companies exploit this new channel to communicate with the investors; another investigates whether information from Twitter predicts the overall stock market, and a third one analyzes the relationship between Twitter activity and the investor response to earnings news. A recent study analyzing the market participants' tweets by Bartov, Faurel and Mohanram (2019) examined the relationship between individuals' tweets and their impact on the company's returns. In this paper, we specifically look at earnings news so that we can fill the research gap in the existing literature by examining whether there is a significant relationship between the tone of earnings tweets disseminated by market participants and proxies of abnormal share return as well as with abnormal share turnover and abnormal share bid-ask spreads?

2. Literature Review

Complementary information in the capital market leads to improving the market information environment and, ultimately, improving stakeholder decision-making (Warren, Moffitt and Byrnes 2015). The Wisdom of Crowds resulting from the opinions of market participants via Twitter can be related to the increase of information in the capital market because this social media has the most user diversity among social media. Wisdom of Crowds as a concept dates back over a century. It refers to the phenomenon that the aggregation of information by individuals with diverse and independent views and opinions will lead to better predictions than the predictions of any single member of a group or even an individual expert. Tweeting market participants is both a source of new information and a tool for disseminating market information (Bartov, Faurel and Mohanram, 2019). Thus, market participants' tweets and other information can improve or modify the information environment and overshadow market variables. Bollen, Mao and Zeng (2011) indicate that the aggregate mood inferred from textual analysis of daily Twitter feeds can help predict changes in the Dow Jones Index. Mao et al. (2012) found that the daily number of tweets that mention S&P 500 shares is significantly associated with the levels, changes, and absolute changes in the S&P 500 Index. Curtis, Richardson and Schmardebeck (2014), who focus on the overall social media (Twitter and Stock Twits) activity over 30-day rolling windows, found that high levels of activity are associated with greater sensitivity of earnings announcement returns to earnings surprises, while low levels of social media activity are associated with significant post-earnings-announcement drift. Azar and Lo (2016) show that the content of tweets can be used to predict future returns around the Federal Open Market Committee (FOMC) meetings. Al Guindy (2017) considers the role of Twitter in improving the information environment by increasing the wisdom of crowds among investors. The results showed that if Twitter news caused a positive feeling in investors, share returns would be higher; otherwise, share returns would be lower; this effect is especially pronounced when there is no consensus among financial analysts. Jung et al. (2018) found that firms strategically disseminate news via Twitter, especially when more people follow it. In this study, users' opinions about news are also examined, and the results illustrate that news followers' opinions neutralize the effects of disseminating firms' news through Twitter. Bartov, Faurel and Mohanram (2019) examined the opinions of people who follow corporate tweets and found that aggregating those who follow corporate tweets effectively predicts future quarterly earnings and corporate earnings returns. The present study considers the negative

tone of market participants' earnings tweets and their relationship with returns, turnover and spreads in the form of the first to third hypotheses. It should be noted that considering the method of analyzing the tone of tweets based on the negative words of the tweets, the negative tone of the tweets has also been considered in the hypotheses.

H1: The negative tone of earnings news disseminated by market participants via Twitter is related to abnormal share returns.

H2: The negative tone of earnings news disseminated by market participants via Twitter is related to abnormal share turnover.

H3: The negative tone of earnings news disseminated by market participants via Twitter is related to the abnormal share bid-ask spreads.

In analysing the tweet's tone, the tweets of market participants play a dual role in the capital market in terms of information. The opinions of market participants, on the one hand, are active in new news and information, and on the other hand, in providing information and news that has already been disseminated from other sources. Re-tweets and tweets containing hyperlinks, disseminated by market participants, can be considered tweets containing duplicate news and no new news for the capital market. These tweets are disseminated for purposes such as re-influencing the reader, providing more explanation about the news and reminding the reader of the news. Re-tweets are tweets received and reposted by market participants from the company's Twitter page or accounts. Tweets containing hyperlinks direct the newsreader to other sources of information to provide further explanations of the news. Bartov, Faurel and Mohanram (2019), in examining the effect of Twitter news on earnings and return forecasting, divided Twitter news into two categories of original news and existing news and found that both types of news are effective in predicting firms' earnings and return. In the present study, the relationship between the tone of disseminated earnings news containing original and existing information by the market participants via Twitter and market variables has been investigated in the form of the fourth to sixth hypotheses:

H4: The negative tone of disseminated earnings news containing the original and existing news via Twitter is related to abnormal share returns.

H5: The negative tone of disseminated earnings news containing the original and existing news via Twitter is related to abnormal share turnover.

H6: The negative tone of disseminated earnings news containing the original and existing news via Twitter is related to abnormal share bid-ask spreads.

3. Research Methodology

3.1. Methods

The purpose of this study is to investigate the relationship between the disseminated news related to the accounting earnings by market participants on Twitter social media and the reaction of the capital market by collecting past information of the firms, post-event research plan with correlation

analysis and applied in terms of purpose. The statistical model used in this research is a multivariate regression model, Excel software is used to collect and classify data, and Stata software is used for multivariate regression analysis. To set the theoretical framework of the research and its background, articles published on the website of the American Accounting Association (AAA) between 2014 and 2019 have been used. Statistical parameters include descriptive statistics to describe and present statistical characteristics of variables and parameters, and inferential statistics consists of estimating coefficients.

3.2. Data Collection Instrument

Data on market participants' opinions about each company on Twitter is extracted by adding the slash symbol ($) to the beginning of the firm's Twitter ID. This data includes the text of the participants' tweets and the number of participants' followers at the tweet date; re-tweets were also extracted using Python. In the first phase, the total market participant tweets of the sample firms from the beginning of October 2015 to March 2020 included 450,000 tweets. The tweets disseminated in the research estimation period were selected in the second stage. The estimated period is 58 days before the earnings announcement, so it begins 60 calendar days before the earnings announcement date and ends 2 days before that date (-60 to -2) (Jung et al., 2018). At this stage, the number of tweets was 130 905. In the last step, the tweets containing the news of earnings announcements were separated. At this stage, the number of tweets was 20,037. The identification of tweets containing earnings announcement news is based on the content analysis of the tweets and using the word list introduced by Bartov, Faurel and Mohanram (2019). The necessary condition is the presence of at least one of the words representing the earnings announcement news in the desired tweet. Market data, including share price, maximum and minimum share price, share exchange volume and share returns, are extracted from the https://www.investing.com website. In order to collect market data by referring to the mentioned site, first identify the earnings announcement date of each company and separately for each financial period and then the market data has been extracted for the estimation period as well as the event period (three-day period earnings announcement). The estimation period is based on a calendar because the basis for extracting Twitter data is also the estimation period. The basis for tweeting firms and other Twitter users is not based on the working days on the share market. On the other hand, the three days around the earnings announcement are considered the working days of the share exchange. To measure the abnormal share returns as a variable, we needed to adjust returns based on the firm's size, determined by "the Center for Research Securities Price". For this purpose, the data related to the portfolio index based on the share market value of the firms were extracted from the https://www.crsp.org website. It should be noted that this index determines the relationship between the market value and share returns. It sorts out the firms into 5 categories and determines the adjusted-based returns. The control variables are extracted from corporate financial statements and through numerous websites.

3.3. Population and Sample Size

The statistical population consists of S&P 500 firms from 2016 to 2019. In the first step, the firms listed at least once in the S&P 500 list during the research period (from November 2015 to March 31,

2019) were selected to specify the sample. At this stage, the number of firms was 642. The next step was to pick a statistical sample; the following items were considered in selecting the statistical sample:

Firms that have an official Twitter account.

Firms that joined Twitter in early November 2015 or earlier.

Firms that are listed on the NewYork Share

Exchange and the Nasdaq Share Exchange.

Companies with incomplete fundamental information were excluded from the sample.

Eight companies with a negative market value ratio to book value (negative equity) were also excluded. After applying these items, the sample size turned out to be 345 films.

3.4. Models Testing Hypothesis

The regression model of the hypotheses is designed by modeling and modifying the Bartov, Faurel and Mohanram (2019):

Model (1) $\text{ABRETURN}_{it} = B_0 + B_1 \text{TONE}_{it} + \sum \text{controls}_{it}$

Model (2) $\text{ABTURNOVER}_{it} = B_0 + B_1 \text{TONE}_{it} + \sum \text{controls}_{it}$

Model (3) $\text{ABSPREAD}_{it} = B_0 + B_1 \text{TONE}_{it} + \sum \text{controls}_{it}$

Model (4) $\text{ABRETURN}_{it} = B_0 + B_1 \text{OTONE}_{it} + B_2 \text{ETONE}_{it} + \sum \text{controls}_{it}$

Model (5) $\text{ABTURNOVER}_{it} = B_0 + B_1 \text{OTONE}_{it} + B_2 \text{ETONE}_{it} + \sum \text{controls}_{it}$

Model (6) $\text{ABSPREAD}_{it} = B_0 + B_1 \text{OTONE}_{it} + B_2 \text{ETONE}_{it} + \sum \text{controls}_{it}$

3.5. Variables
3.5.1. Dependent Variables

ABRETURN: Abnormal share returns are measured as the difference between three-day absolute size-adjusted returns and the mean three-day absolute size-adjusted returns in an estimation period, divided by the standard deviation of the mean absolute size-adjusted returns in the estimation period. The estimation period begins 60 calendar days before the earnings announcement date and ends 2 days before that (Jung et al., 2018).

ABTURNOVER: Abnormal share turnover is measured as a three-day volume divided by outstanding shares minus the average three-day turnover in the estimation period. The estimation period begins 60 calendar days before the earnings announcement date and ends 2 days before that (Jung et al., 2018).

ABSPREAD: Abnormal spreads are measured as the three-day average spread (ask minus bid price, divided by their mean) minus the average three-day spread in the estimation. The estimation period

begins 60 calendar days before the earnings announcement date and ends 2 days before that (Jung et al., 2018).

3.5.2. Independent Variables

TONE: The tone of the disseminated tweets was measured using textual analysis. After selecting the tweets containing earnings announcement news based on the vocabulary of Bartov, Faurel and Mohanram (2019), the analysis of the positive or negative tone of the tweets was performed based on a wordlist developed in Loughran and McDonald's (2011) analysis of 10-K filings (LM wordlist)[i]. According to the textual analysis based on the LM word list in previous research, tone analysis based on the negative words in this list is more accurate. Therefore, tone analysis is based on the number of negative words in each tweet. First, we identify the number of negative words in each tweet and assign a weight to each tweet. The weighing method for each tweet is based on the number of followers of the company's Twitter account, multiplying the number of negative words in each tweet by one plus the log of one plus the number of followers of the company's Twitter account on the earnings announcement date. Then, the sum of the weighed negative words of the tweets during the estimation period is multiplied by -1 and divided by one plus the total number of positive and negative words of the tweets, as follows:

$$\text{TONE}_{it} = -1 \times \frac{\sum [\text{number of negative words per tweet} \times [1+(\log 1+\text{number of followers})]]}{1+ \text{the total positive and negative words of tweets}_{it}}$$

After quantifying the tone of earnings announcement tweets, the mentioned variable has been divided into two components: the tone of tweets containing original news (OTONE) and the tone of tweets containing existing news (ETONE). Tweets containing existing news are tweets which meet one of the following conditions:

A: Re-tweets: These tweets are prefixed with "RT", and are also possible to identify.

B: Tweets containing hyperlinks: Tweets with a link to connect to the company's website or other websites.

Tweets that do not meet the requirements of A and B are in the group of tweets containing the company's original news. In order to calculate the tone variable of tweets containing original and existing news, after separation, each group of tweets (original and existing) is weighed and calculated as follows:

$$\text{OTONE}_{it} = -1 \times \frac{\sum [\text{number of original negative words per tweet} \times [1+(\log 1+\text{number of followers})]]}{1+ \text{the total positive and negative words of original tweets}_{it}}$$

$$\text{ETONE }_{it} = -1 \times \sum \frac{[\text{number of existing negative words per tweet} \times [1+(\log 1+\text{number of followers})]]}{1+ \text{the total positive and negative words of existing tweets }_{it}}$$

3.5.3. Control Variables

Based on the background research (Henry and Leone, 2016; Jung et al., 2018; Al Guindy, 2017; Bartov, Faurel and Mohanram, 2019), the control variable is derived from the criteria affecting the presence of firms in the social media Twitter and the Criteria affecting the news coverage on the social media, as follows:

Un-sophisticated investors (UNSOPHI): The unsophistication proxy is defined using the percentage of outstanding shares owned by individual retail investors, assuming that retail investors are less sophisticated than institutional investors. This variable is measured as one minus percentage of the shares held by the institutional investors of Company i for period t (Jung et al., 2018).

The firm size (SIZE): The firm size was measured as the natural logarithm of the market value of the firm's equity i at the end of period t (Al Guindy, 2017).

Growth (GS): The yearly sales growth is measured as the ratio of the total sales for the period t compared to period t-1 (Jung et al., 2018).

Market-to-book value (MTB): The market value to book value is measured as the market-to-book ratio of firm i for the period t (Jung et al., 2018).

Leverage (LEVE): This proxy is measured as the debt-to-asset ratio of firm i for the period t (Jung et al., 2018).

The firm age (FIRMAGE): This variable is measured as the number of years since a firm's founding in the t-1 period (Bartov, Faurel and Mohanram 2019).

The Loss (LOSS): The loss variable is an indicator variable set to 1 (0 otherwise) if the firm actual earnings per share are less than one (Henry and Leone, 2016).

4. Findings

4.1. Descriptive Statistics of Quantitative Variables

This study's descriptive findings, including mean, standard deviation, minimum, and maximum observation, are presented in Table 1. It should be noted that the number of companies studied is 345 companies, and their information has been collected for 4 consecutive years. According to the results of descriptive statistics, on average, the sample companies' abnormal share returns, abnormal share turnover and abnormal spreads are 2.674 and 0.012and 0.011, respectively.

Table 1. The Descriptive Statistics of Quantitative Variables

Variable	Symbol	Min	Max	Mean	Std. Dev
Independent	TONE	-3.370	0.000	-1.576	0.953
	OTONE	-3.373	0.000	-1.547	0.982
	ETONE	-3.471	0.000	0.500	0.900
	PTONE	0.000	1.000	0.386	0.320
	NTONE	-1.000	0.000	-0.474	0.338
Dependent	ABRETURN	-0.903	14.522	2.674	3.153
	ABTURNOVER	-0.015	0.090	0.012	0.017
	ABSPREAD	-0.007	0.048	0.011	0.01
Control	UNSOPHI (%)	3.639	81.29	45.339	14.404
	SIZE (log)	3.189	5.583	4.337	0.485
	GS	-0.290	0.922	0.078	0.155
	MTB	0.550	96.433	5.902	11.634
	LEVE	0.010	0.813	0.302	0.176
	FIRMAGE	1	205.09	67	48.669

Other descriptive statistics related to independent and control variables are also shown in Table 2.

Table 2. The Frequency Distribution of Loss Variable (LOSS)

Variable	Dummy		Valid %	N
	EPS > 0	0	%96.9	1436
LOSS	EPS < 0	1	%3.1	46
			%100	1482

The frequency distribution table (table 2) states that among the studied companies and in the years investigated, 1436 (96.9%) companies have positive earnings per share, and 46 companies (3.1%) have negative earnings per share (loss).

4.2. Inferential Statistics
4.2.1. Regression Model Type Identification Tests
In order to choose whether the panel regression models or OLS regression models, the F-Limer test was used, and finally, the panel regression model was selected as the appropriate model. After selecting the panel regression, the choice between fixed effects panel regression models and random effects panel regression was made using Hausman Test. The results of the Hausman Test indicated that the panel model was selected with random effects. The merger test was used to test the integrated data model against random effects, which showed no ability to integrate temporal and spatial effects in the model. After selecting the appropriate model, the stability of variance and serial autocorrelation of the model residues have been investigated using the parent test.

The results of the parent test demonstrated that the assumption of variance homology of the re-original models was not established. Also, the results of the serial autocorrelation study between the rest of the models suggest that the underlying assumptions of variance homogeneity and lack of serial

autocorrelation are not established for the above models; therefore, to solve the problem of variance inequality and serial autocorrelation, the least generalized quadratic regression model is used.

4.2.2. Hypotheses Test Results

Table 3. Association between TONE and ABRETURN

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	2.277	0.560	4.060	<0.001	1.010
TONE	-0.023	0.059	-0.400	0.688	1.010
UNSOPHI	-0.003	0.003	-0.800	0.425	1.050
SIZE	0.027	0.120	0.230	0.820	1.070
GS	-0.875	0.307	-2.840	0.004	1.020
MTB	0.023	0.006	3.680	<0.001	1.040
LEVE	-0.402	0.340	-1.180	0.237	1.030
LOSS	-0.621	0.327	-1.900	0.058	1.030
FIRMAGE	-0.001	0.001	-1.330	0.182	1.010

Table (3) results show no significant relationship between the negative tone of earnings news disseminated by market participants and abnormal share returns.

Table 4. Association between TONE and ABTURNOVER

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.038	0.001	24.510	<0.001	1.040
TONE	0.000	0.000	0.170	0.867	1.010
UNSOPHI	0.000	0.000	2.970	0.003	1.060
SIZE	-0.007	0.000	-22.750	<0.001	1.110
GS	-0.003	0.001	-2.630	0.009	1.020
MTB	0.000	0.023	3.550	<0.001	1.040
LEVE	0.000	0.001	0.920	0.355	1.030
LOSS	-0.004	0.002	-2.390	0.017	1.030
FIRMAGE	0.000	0.009	3.910	<0.001	1.010

Table (4) shows no significant relationship between the negative tone of earnings news disseminated by market participants and the abnormal share turnover.

Table 5. Association between TONE and ABSPREADS

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.025	0.001	16.700	<0.001	1.030
TONE	0.011	0.000	0.030	0.972	1.010
UNSOPHI	-0.000	0.023	-2.000	0.045	1.050
SIZE	-0.003	0.000	-9.480	<0.001	1.090
GS	-0.002	0.000	-3.420	0.001	1.020
MTB	-0.000	0.000	-1.550	0.121	1.040
LEVE	0.001	0.000	2.010	0.044	1.030
LOSS	0.003	0.001	2.230	0.026	1.030
FIRMAGE	-0.010	0.007	-1.440	0.150	1.010

The results of Table (5) show that there is not a significant negative relationship between the negative tone of the disseminated earnings tweets of market participants and the abnormal share spread.

Table 6. Association between OTONE, ETONE and ABRETURN

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	2.180	0.568	3.830	<0.001	1.010
OTONE	-0.051	0.058	-0.870	0.383	1.020
ETONE	0.052	0.059	0.880	0.381	1.020
UNSOPHI	-0.002	0.003	-0.560	0.575	1.060
SIZE	0.041	0.121	0.340	0.731	1.070
GS	-0.857	0.299	-2.860	0.004	1.020
MTB	0.023	0.006	3.700	<0.001	1.040
LEVE	-0.423	0.343	-1.230	0.217	1.030
LOSS	-0.601	0.329	-1.830	0.068	1.030
FIRMAGE	-0.001	0.001	-1.570	0.117	1.010

The results of Table (6) show that there is no significant relationship between the negative tone of earnings tweets containing the original information disseminated by the market participants and abnormal share returns, as well as the negative tone of earnings tweets containing existing information disseminated by the market participants and abnormal share returns.

Table (7) shows a significant relationship between the negative tone of earnings tweets containing the original information disseminated by the market participants and the abnormal turnover of shares. However, there is no significant relationship between the negative tone of earnings tweets containing the existing information disseminated by the market participants and the abnormal turnover of shares.

Table 7. Association between OTONE, ETONE and ABTURNOVER

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.040	0.001	25.730	<0.001	1.040
OTONE	0.000	0.000	2.030	0.043	1.020
ETONE	0.000	0.000	-1.390	0.166	1.020
UNSOPHI	0.000	0.000	3.310	0.001	1.060
SIZE	-0.007	0.000	-23.990	<0.001	1.110
GS	-0.003	0.001	-2.560	0.010	1.020
MTB	0.000	0.023	3.440	0.001	1.040
LEVE	0.000	0.000	0.060	0.951	1.030
LOSS	0.005	0.001	-2.540	0.011	1.030
FIRMAGE	0.000	0.009	3.850	<0.001	1.010

Table (8) shows no significant relationship between the negative tone of earnings tweets containing the original information disseminated by the market participants and the abnormal share spreads. However, there is a significant relationship between the negative tone of earnings tweets containing existing information disseminated by the market participants.

Table 8. Association between OTONE, ETONE and ABSPREADS

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.025	0.001	16.890	<0.001	1.030
OTONE	0.000	0.000	1.490	0.137	1.020
ETONE	-0.000	0.000	-4.780	<0.001	1.020
UNSOPHI	-0.000	0.000	-3.130	0.002	1.060
SIZE	-0.003	0.000	-9.370	<0.001	1.090
GS	-0.003	0.000	-3.600	<0.001	1.020
MTB	-0.000	0.000	-1.770	0.077	1.040
LEVE	0.001	0.001	1.340	0.181	1.030
LOSS	0.003	0.001	2.360	0.018	1.030
FIRMAGE	-0.010	0.007	-1.340	0.180	1.010

4.2.3. Additional Analyses

In the research background, two methods have been used to analyze the content of the tweets. In the first method, content analysis was done based on only the negative words of each tweet. This method has been used to measure the tone of the tweets in the main hypotheses of the research. The additional tweets' tone analyses using the second method and based on the LM vocabulary is an adjustment to the model presented by Al Guindy (2017). For this purpose, after selecting the earnings tweets, using the LM word list, the number of positive and negative words of each tweet has been identified. Subsequently, the tweet with more negative words is considered negative, and the tweet with more positive words is considered positive. Tweets with the same number of negative and positive words are zeroed and discarded. The details of the analysis are as follows:

Step 1: Identify the tone of each tweet as a percentage of the total positive and negative words in each tweet to increase the level of accuracy of content analysis. In other words, in a tweet whose content is identified as positive, the number of positive words equals the total number of positive and negative words, and the result is identified as a ratio.

Step 2: Modify the tone of each tweet based on the number of followers of the Twitter page on the date of the tweet; thus, the result of the calculation in the previous step is multiplied by one plus the logarithm of one plus the number of followers of the Twitter page on the date of the tweet.

Step 3: For each company in each period, the value is assigned to positive and negative tweets separately. For this purpose, the absolute value of the sum of the value of the positive and negative tweets identified in the previous step is subtracted. In the case of subtraction, once the value obtained from the sum of the positive tweets is adjusted and again, it applies to the value obtained from the sum of the adjusted negative tweets.

In the additional analysis of the study, three models have been examined as follows:

Model (1)

$$\text{ABRETURN}_{it} = B_0 + B_1 \text{ PTONE}_{it} + B_2 \text{ NTONE}_{it} + \sum \text{controls}_{it}$$

Model (2)

$$\text{ABTURNOVER}_{it} = B_0 + B_1 \text{ TONE}_{it} + B_2 \text{ NTONE}_{it} + \sum \text{controls}_{it}$$

Model (3) $ABSPREAD_{it} = B_0 + B_1 \, TONE_{it} + B_2 \, NTONE_{it} + \sum controls_{it}$

ABRETURN, ABTURNOVE, and ABSPREAD share abnormal returns, turnover and bid-ask spreads.

PTONE $_{it}$: The positive tone of the earnings tweets of the company's participants i in period t.

NTONE $_{it}$: The negative tone of the earnings tweets of the participants of the company i in the period t.

Control variables include UNSOPHI, SIZE, GS, MTB, LEVE, LOSS and FIRMAGE.

The test results of the additional models are as follows:

Table 9. Association between PTONE, NTONE and ABRETURN

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	2.333	0.582	4.000	<0.001	1.010
PTONE	-0.318	0.205	-1.550	0.122	1.130
NTONE	-0.043	0.195	-0.220	0.823	1.140
UNSOPHI	-0.002	0.003	-0.780	0.433	1.060
SIZE	0.040	0.121	0.330	0.738	1.070
GS	-0.861	0.298	-2.890	0.004	1.020
MTB	0.024	0.006	3.700	<0.001	1.040
LEVE	-0.351	0.339	-1.040	0.300	1.030
LOSS	-0.583	0.330	-1.770	0.077	1.030
FIRMAGE	-0.001	0.001	-1.390	0.166	1.010

Table (9) shows no significant relationship between earnings tweets' positive and negative tone and the abnormal share return.

Table 10. Association between PTONE, NTONE and ABTURNOVER

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.040	0.001	25.440	<0.001	1.040
PTONE	-0.001	0.000	-2.130	0.033	1.130
NTONE	0.001	0.000	2.820	0.005	1.140
UNSOPHI	0.000	0.000	4.240	<0.001	1.060
SIZE	-0.007	0.000	-23.710	<0.001	1.110
GS	-0.002	0.001	-2.240	0.025	1.020
MTB	0.000	0.000	2.750	0.006	1.040
LEVE	0.000	0.001	0.670	0.503	1.030
LOSS	-0.004	0.002	-2.430	0.015	1.030
FIRMAGE	0.000	0.008	4.460	<0.001	1.010

The results of Table (10) show a significant relationship between the positive tone (to negative coefficient) and negative tone (to positive coefficient) of earnings tweets and abnormal share turnover.

Table 11. Association between PTONE, NTONE and ABSPREADS

	Coefficient	Std. err.	Z	P>|z|	VIF
cons	0.025	0.001	17.350	<0.001	1.030
PTONE	-0.001	0.000	-3.470	0.001	1.130
NTONE	0.000	0.000	1.880	0.060	1.140
UNSOPHI	-0.000	0.024	-1.710	0.087	1.060
SIZE	-0.003	0.000	-9.480	<0.001	1.090
GS	-0.002	0.000	-3.530	<0.001	1.020
MTB	-0.000	0.000	-1.590	0.112	1.040
LEVE	0.001	0.000	2.070	0.038	1.030
LOSS	0.003	0.001	2.300	0.022	1.030
FIRMAGE	-0.009	0.007	-1.250	0.210	1.010

The results of Table (11) show that there is a significant relationship between the positive tone (to negative coefficient) and negative (p-value of 0.060) tone (to positive coefficient) of earnings tweets and the abnormal share spreads.

5. Conclusion

The present study investigated the thematic relationship between earnings news disseminated by market participants on Twitter and market variables, including abnormal share returns, abnormal share turnover and abnormal share spreads. For this purpose, according to the official approval of Twitter, awareness of the capital markets by the Securities and Exchange Commission (SEC), data related to 345 firms from the list of US S&P 500 firms, for a period of four years: 2016-2019 were extracted and were analyzed by Stata software. The results prove no significant relationship exists between the negative tone of earnings news disseminated by market participants via Twitter and the market variables. These results were not in line with the findings of Al Guindy (2017); the results of Al Guindy (2017) explain that the negative tweets of the market participants lead to lower stock returns; furthermore, on days when the market participants' tweets are negative, the trading volume is abnormally high. It was also inconsistent with Bartov, Faurel and Mohanram (2019). Bartov, Faurel and Mohanram (2019) found a significant positive relationship between the negative tone of the market participants' tweets and the abnormal returns. On the other hand, sorting out the tweets into the original earnings tweets and existing earnings tweets showed no significant relationship between original and existing earnings tweets with abnormal returns. These results did not correspond to Bartov, Faurel and Mohanram (2019). They illustrate a significant positive relationship between the negative tone of the original tweets and the share return. In the Bartov, Faurel and Mohanram (2019) study, all financial tweets have been examined, not merely earnings tweets. In other words, the tweets analyzed in this study were more limited, which could be a reason for dissimilar findings. The results also show a significant relationship between the tone of the original earnings tweets and the abnormal share turnover. There is a significant relationship between the tone of existing earnings tweets and bid-ask spreads. Finally, additional analysis based on separating tweets into positive and negative showed a significant relationship between the tone of positive and negative tweets and the abnormal stock turnover and spreads.

The reasons for the inconsistency of the results with some previous studies are as follows:

- Focus on tweets containing earnings news in the present study.

- Previous studies have often been conducted before 2013 (before the Securities and Exchange Commission (SEC) stated on Twitter); the present study was carried out after the statement issuance.
- Differences in sources of the disseminated tweets, as some studies have analyzed tweets posted by firms and some by market participants. Previous studies have focused more on examining corporate tweets.

The results show that the market participants' dissemination of additional news through social media channels can be used to harmonise awareness in the capital markets. Therefore, along with the positive effects of social media on improving the information environment of the firms, users of the web environment are recommended to consider the quantitative and qualitative news disseminated on social media as a widely disseminated information channel and enjoy the benefits of this channel along with other information resources to increase their awareness of investment decisions. On the other hand, in order to eliminate the negative effects of social media based on the strategic dissemination of news on social media, it is recommended that users use social media as a source of information carefully and vigilantly. Finally, considering the importance of social media in financial markets, it is suggested that in future research, the impact of qualitative and quantitative news, the existing aspects of the market, such as reducing information asymmetry, improving information transparency and information quality characteristics, shall be addressed. Moreover, by analyzing and comparing new information channels and the level of news disseminated in domestic and global information environments, attempt to gain more awareness of the existing differences and apply them in advancing the capital market goals.

Endnotes Terminology

Endnote Number	Endnote Content
1	Adjusted, earning, ebit, ebitda, eps, expense, fiscal, gaap, gain, in the black, in the green, in the red, income, loss, noi, nopat, normalized, oibda, operating, per share, pro forma, profit, proforma, pro-forma, results, revenue, sales, yearend, year-end
2	Mega cap, Big cap, Mid cap, Small cap, Micro cap, Nano cap.
3	http://www.gurufocus.com, http://www.investing.com, http://www.fortune.com , http:// www.siccode.com, http://www.sec.gov
4	The word list used in the General Inquirer text-processing program, the Harvard IV-d dictionary, is available at: http://www.wjh.harvard.edu/~inquirer/spreadsheet_guide.htm

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Designing an Earnings Management Improvement Model for Iranian knowledge-based Firms

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ARTICLE INFO

Abstract

The present study designs an earnings management improvement model appropriate for Iranian knowledge-based firms (KBFs). This study is interpretive in the model exploration phase and positivist in the model testing phase, and in general, this is applied research. The research sample in the qualitative phase comprises the experts in the field of earnings management, including accounting faculty members (8), senior managers of KBFs (7), and members of the Iranian National Tax Administration (INTA) (5); thus, a total number of 20 experts were interviewed to collect the qualitative data. The research questionnaire for collecting the quantitative data was designed according to the exploratory factor analysis (EFA). In the quantitative phase, using the sample size calculator (the G*Power software) at the alpha level of 0.1 and test power of 0.85, the final research sample comprises 153 participants. The research approach uses mixed methods, and the employed strategy is grounded theory. The constant comparative method in the three stages of open, axial, and selective coding based on the Strauss et al. (1996) method and the MAXQDA software was employed to analyse the data. The path analysis of the explored model was carried out based on the variance-based structural equation modeling (SEM) using SPSS version 24 and Smart PLS 3.0. The study results indicate 53 indicators, including more than 18 components and 7 latent variables.

NUMBER OF REFERENCES
54

NUMBER OF FIGURES
4

NUMBER OF TABLES
7

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1. Introduction

The present era is the knowledge-based economy era (Moisio, 2018). The knowledge-based economy creates, acquires and transmits knowledge to improve economic growth and development. A review of world economic development history indicates that more developed societies have accelerated their national development process by applying and focusing on the knowledge-based economy. In this view, the core of knowledge-based economic activities is the KBFs because KBFs focus on societies with a high and sustainable growth rate (Skrodzka, 2016; Fakhari, Salmani and Daraei, 2013). Increased wealth is increasingly affected by increased knowledge in today's economy. That is, the more the role of knowledge in the economy improves, the more the process of wealth increase will be facilitated (Brödner, 2008).

In this path, the Literature review shows that the performance of the company and the role of its earnings management structure in it have been notified by the previous writers. In this regard, the research shows that earnings management has an important place in the company's development or weakness, especially in knowledge-based areas as Kim, Lee and Park (2022) have demonstrated that earnings management has a vital role in the previous company's performances and after transferring it. Thus, earnings management was essential in improving and developing the considered company. According to this view, with the growth of KBFs, financial reporting has become the focus of the attention of managers, shareholders, stakeholders, regulators, and policymakers (Koolivandet al., 2021). The literature review demonstrates that prior empirical research has focused on financial reporting in the field of earnings management in KBFs (Arifin, 2017; Clarke, 2005; Jorissen, Lybaert and Van de Poe, 2006). It should be noted that the growth or the stagnation of KBFs can affect managers' decisions. In this regard, two trends can be explained in general. First is the time when the economy is in favorable conditions. In this situation, managers are required to present their reports based on stakeholders' expectations. Second, economic growth and development are in crisis and recession. In this situation, managers' failure to report positive results leads to less severe consequences. Thus, research suggests that, in this situation, firms' managers tend to engage in earnings management (Cimini, 2015). In terms of concept, earnings management is considered a valuable channel for transmitting information such as a firm's financial position to investors. In this respect, Jones (1991) and Roychowdhury (2006) introduce earnings management as an essential trait in assessing the economic and financial transparency of a firm (Lin and Shen, 2015). Thus, earnings management reflects statistics employed by managers for presenting information in firms' financial statements (Scott, 2015), while De Meo et al. (2017) examine earnings management in terms of managerial actions and state that managers engage in earnings management by manipulating financial statements through changing accounting methods and information. In a comprehensive definition of accounting, Zamora (2012) states that earnings management should be considered the deliberate manipulation of financial statements to deceive stakeholders about the firm's actual performance. The concept of earnings management refers to presenting unreal revenue figures in firms' financial statements (Garcia Osma, Gomez-Conde and Lopez-Valeiras, 2020). In this regard, the managers, leaders, and societies expect to see the company's financial statements with the general laws and regulations. This clarity will lead to improvement and development. Transparency in financial statements and reports can enable the company to answer stakeholders' questions. Therefore earnings management will be critical from this point of view (Mangala and Dhanda, 2021).

The theoretical review indicates that earnings management incentives are the reasons for managers' controlling information, which increases managers' tendency to engage in earnings management. However, in some situations, depending on firms' micro and macro environmental factors, specific incentives can increase or decrease. Earnings management can be defined as a deliberate intervention

in financial reporting to achieve earnings goals using different accounting methods (Callao, Jarne and Wroblewski, 2021).

The theoretical importance and necessity of paying attention to earnings management lie in its disastrous and negative economic consequences for the firm. Making decisions about income, financial strategies, and investment attraction are significant disadvantages of earnings management (Oktaviani and Mochklas, 2020). As Harris, Karl and Lawrence (2019) state, firms' managers are often interested in obtaining better short-term results. As a result, they move towards enhancing the stock price in the shortest time instead of developing long-term plans for the firm's growth and development. Thus, managers use earnings management to show a false picture of the firm's economic position. Therefore, earnings management is a method in which managers attempt to manipulate the firm's financial statements to maximize earnings in the short term.

The literature review indicates the existence of research gaps in earnings management in the Iranian context. In terms of systematic criticism, a review of the conducted research in this field demonstrates that different studies on earnings management and its effects have been conducted in various organizations. Most of these studies have been generally done using models based on the earnings of accounting methods, the discretionary accruals model (Jones, 1991), the modified jones model (Dechow et al., 1995), combined-competitive model (Bunge, 1976), a significant relationship has been found among these factors. It should be noted that, first, most of these studies have been conducted in organizations other than KBFs and considering the unique characteristics of these firms and their role in the knowledge-based economy, their financial transparency is of great importance; in addition, considering the significance of KBFs in the country, there is a need to research to design a model appropriate for KBFs to improve earnings management. Despite this research gap, no research has investigated this topic in Iran. Second, most earnings management studies are generally limited to models based on accounting methods, and influencing factors such as causal conditions and contextual and intervention factors, which require interpretive (qualitative) and paradigmatic (mixed methods) research, are not considered. Also, identifying strategies and consequences of applying the earnings management improvement model in KBFs is another research gap the present study attempts to fill by exploring the desired earnings management improvement model. Hence, KBFs need a model for improving earnings management as no model is appropriate for these firms' functions, approaches, and environmental factors.

The researcher is interested in this research. Some of the reasons and motivations of the writer are as follows: literature enrichment of the earnings management, considering the role and the place of being under the cultural, political, and economic influences, this paper focuses on theoretical reinforcement. The writer is interested in this research's political and influential role in knowledge-based companies. Knowledge-based companies have a significant role in improving and developing societies' economies; thus, researching knowledge-based companies is popular. In fact, because of the importance of earnings management's fundamental role in financial statements and the place of knowledge-based companies, the researcher's interest in finding a model based on the Iran context model will be highlighted.

Therefore, consistent with the research problem statement and purpose, this research's fundamental question is "what is the earnings management improvement model appropriate for Iranian KBFs?".

2. Theoretical Framework

2.1. Earnings management

Earnings are one of the main economic categories that reflects all the aspects of enterprises' activities; thus, maximizing earnings and minimizing costs is one of the main goals of every business

entity and KBF (Honcharenko, 2019). The earnings construct indicates the presence or absence of a firm's financial stability. This variable shows the increase in shareholder value and wealth. Firms with a positive earnings situation in financial reports can attract shareholders and investors (Tabassum, Kaleem and Nazir, 2015). Managers use earnings management to show unreal results about the achievement of the firm's goals and report information that is different from the reality of the current situation by using accounting distortions caused by accounting methods (Rezaei Lashkjany and Samadi Largani, 2017). The concept of earnings management as an essential structure was always emphasized. In recent years, many researchers from all over the world have considered this variable. This shows the importance of earnings management in accounting and financial reporting and its role in companies' improvement and development (Lin and Wu, 2022, Zalata et al., 2022; Osma, Gomez-Conde and Lopez-Valeiras,2022).

Earnings management doesn't show the actual financial statements; it shows the non-usage of accurate data in the financial prediction of the company in a long-term process and the company's future. The companies with more minor earnings management discomforts have more predicting ability toward the future changes in the financial sector. In general, the quality of financial reporting has an essential role in a company's decisions. In this regard, earnings and management directly relate to financial reporting (Mangala and Singla, 2021). As explained, earnings management has an essential role in misguiding the stockholders. Earnings management affects the accounting of financial statements by unreal and unclear information for the reported contracts. It deviates from the results and makes the info untrue (Kong, 2022). In another definition, earnings management can be studied from the attitude perspective. In this regard, earnings management is defined as a purposeful structure in financial reporting for achieving personal earnings. But these concepts are along with some ideas like behaviors, judgments, and personal and human decisions. Thus earnings management shows the behavior issues in the financial reporting. (Viana, Lourenco and Black, 2021).

Earnings management occurs when managers attempt to mislead stakeholders about the firm's current position by changing financial reports. Although prior literature suggests several incentives for managers to engage in earnings management, codes such as liabilities, debts, reward plans, stakeholders' expectations, and capital attraction can be considered the most important reasons for using earnings management. Therefore, in a definition, earnings management refers to managerial decision-making that leads to consequences such as non-reporting of the firm's earnings in the short term and maximizing firm value unrealistically (Alzoubi, 2016). According to Tabassum, Kaleem and Nazir (2015), managers use different forms of earnings management, which can be legal or illegal. There are two types of earnings management: real earnings management and accrual-based earnings management. Accrual-based earnings management focuses on changing accounting methods, while real earnings management means accelerating earnings by changing business activities. The literature on earnings management shows a variety of theories and models which are generally focused on the measurement and accounting formulas of earnings management. Models such as positive accounting theory (Watts and Zimmerman, 1990), agency theory (Jensen and Meckling, 1976), and income smoothing theory (Gordon, 1964) are the most important examples. Earnings management is management's intervention to report unreal information to stakeholders, which is done by changing financial statement procedures (Octaviani and Kartikaningdyah, 2019).

2.2. Earnings management in KBFs
In today's situation, the companies focus on the non-tangible assets and the fundamental knowledge for the lack of ability to predict environmental changes based on the profound technological, social, and economic changes in society. Therefore, moving toward improving and developing knowledge-based companies is considered the need of societies. Knowledge-based companies are learning

companies; these companies create, trade, and develop knowledge to produce various products. Although managing knowledge-based companies have multiple variables, the authorities and leaders have submitted them recently and policymakers (Hosseini et al., 2022).

As KBFsplay a considerable role in the economy, they need financial transparency, the determination of earnings and loss, and positive or negative business value. Managers attempt to indicate that their income matches the industry position to avoid being eliminated from the competitive environment. Thus, in KBFs, managers use earnings management to help the firm's performance by indicating a favorable position even if it is not real. Jiao, Mertens and Roosenboom (2007) find that the effect of earnings management in KBFs can be known in the direct relationship between earnings management and firm performance because earnings management is a method that can play a role in capital attraction and stock returns. Earnings management is a tool for changing the quality of real information, which improves the firm's attractiveness in an unreal way (An, Li and Yu, 2016). The importance of earnings management, especially in KBFs, is that shareholder wealth is affected by the association between earnings and stock returns and the relationship between earnings management and firm value. In prior research, earnings management has been used to measure information quality, but in the present study, earnings management is considered a model appropriate for KBFs. As (Jensen and Murphy, 1990) suggest, increasing a firm's power and prestige is one of the significant incentives for managers to change financial statements. Also, firms with great credibility are in a favorable competitive condition. Managers of KBFs attempt to raise more capital by using earnings management; thus, from theoretical necessity, earnings management can play an essential role in KBFs.

2.3. KBS in Iran
The emphasis of the modern economy is on intangible assets such as information and knowledge, which have become the main competitive advantage of firms. This is because the economy has become information- and knowledge-based. Thus, firms that base their activities on knowledge will have more wealth (Vrdoljak Raguž, BorovacZekan and Peronja, 2017). In this respect, KBFs can be considered the creators of a knowledge-based economy. In fact, without KBFs, it is not possible to reach a knowledge-based economy. Although the knowledge-based economy is a modern economy for facilitating the creation and distribution of wealth, its primary tool is the growth of KBFs (Allahyary and Abbasi, 2012). Focusing on knowledge-based activities in Iran is one of the country's critical economic factors emphasized in resistance economy policies. It can help improve production and employment in the country and is achievable through developing KBFs. A review of the KBFs in Iran shows that, in recent years, with the increase in economic pressures and income limitations, KBFs in Iran have grown. According to the innovation and prosperity fund report, currently, there are more than 2219 KBFs, of which nearly 1348 firms are in their infancy. Also, 725 firms produce goods and services, and 146 industrial firms have knowledge-based activities. However, 280 KBFs producing knowledge-based goods and services have an essential role in the country's economy and resistance economy as a macro-strategy of the national economy under the condition of international sanctions and the current economic crisis. Moreover, recent reviews indicate the increasing focus on the knowledge-based economy in Iran in recent years. According to the vice-presidency of information and technology assessments in 2020, Iran had 5700 new economic firms. However, the statistical data show the failure of a considerable percentage ofKBFs in Iran. The failure of 11 percent of KBFsin their early years and 80 percent of KBFs with more than a 5-year lifespan has highlighted the necessity of paying attention to KBFs more than before (Mohammadkazemi, Talebi and Davari, 2021).

3. Research Methodology

The present study is paradigmatic research because, according to philosophical presumptions, it emphasizes identifying and testing the earnings management model based on environmental, cultural, political, social, and economic conditions. Regarding reasoning and approach, this research is interpretive in the model exploration stage and positivist in the model testing stage. Thus, the research approach is mixed. The applied strategy of the research is grounded theory because the research purpose is to theorize and explore a model for improving earnings management in KBFs in Iran based on environmental conditions. Thus, the present study is conducted in two phases. The first phase, the model exploration, has been done based on Strauss et al. (1996) method. Accordingly, the research categories were identified after collecting qualitative data (themes derived from the literature + in-depth interviews) in the three stages of open, axial, and selective coding. The research sample, in the qualitative phase, comprises experts in the field of earnings management, including accounting faculty members (8 experts), the senior managers of KBFs (7 experts), and the members of the Iranian National Tax Administration (INTA) (5 experts), in total, 20 experts were interviewed for collecting the qualitative data. To test the validity of the research model in the qualitative phase, according to Creswell (2007), in the first step, with the method of matching participants' views, after coding by the researcher, the participants undertook the coding process of the open, axial. Selective coding and their opinions were collected and considered in the corrective coding. In the second step, with the method of peer review, after the process of coding, the collected qualitative data were given to five experts, and they were asked to do the coding. The results showed that more than 90 percent of the codes were close. Thus, it can be stated that the data and the coding are acceptable in terms of validity. In the third step of validity, the participatory nature of the research was tested. In this step, to further ensure the validity of the coding, the participants' views were simultaneously used in the coding. In the quantitative phase and the research model testing, the statistical population of research consists of the managers of KBFs and the available sample comprises Tehran's KBFs.The target population consists of the managers of KBFs. To calculate the research sample size in the quantitative phase, the G*Power software was used. Based on Cohen's suggestions, the lower the Alpha error level, the more generalizability of the sample results in a larger sample; in other words, the researcher is less likely to commit a Type I error. Moreover, the higher the power of the test, the lower the probability of a Type II error (Cohen, 1998).
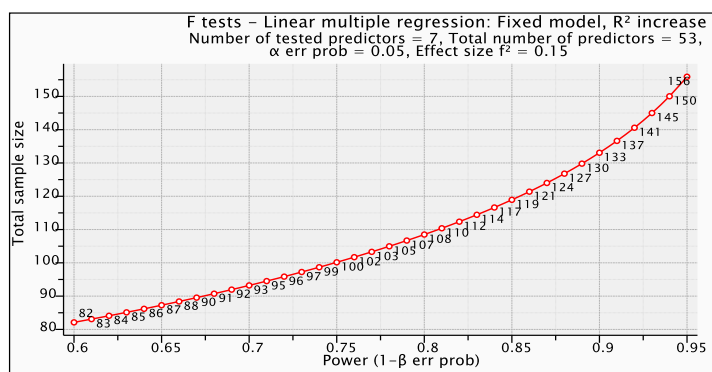
3.1. Research findings

Figure 1. The software output for determining the size of the research sample

According to the software output in Figure (1), at the error level of 0.15 and the test power of 0.95, 7latent variables, and 53 observable variables, the statistical research sample has been estimated 153. The research questionnaire for qualitative data was developed based on the exploratory factor analysis. Table 1 presents the results of the exploratory factor analysis.

Table 1. The exploratory factor analysis of the model

Variable	KMO	Bartlett	Test result
Managers' individual factors	0.987	0.000	Confirmed
Management support system	0.852	0.021	Confirmed
Intra-organizational strategies	0.751	0.011	Confirmed
Information system	0.796	0.000	Confirmed
Environmental factors	0.840	0.000	Confirmed
Financial support system	0.898	0.035	Confirmed
Firm growth and development	0.931	0.000	Confirmed

The results presented in Table (1) (the exploratory factor analysis) show that the coefficients of all the variables are greater than 0.7; thus, each variable's exploratory indicators are homogeneous. Moreover, the significance coefficient of the Bartlett test is less than 0.5; therefore, the sampling adequacy for the exploratory factor analysis is also confirmed.   Before collecting the final sample, the content validity of the explored questionnaire was quantitatively calculated and confirmed using the content validity ratio (CVR) and the Content Validity Index (CVI). Furthermore, in this section, a pre-test was used with a sample of 30, and the model's reliability based on Cronbach's Alpha test was also confirmed. Moreover, after collecting the final sample, the construct validity (convergent and discriminant)and the research model's reliability using reliability tests (Cronbach's alpha, shared reliability, and composite reliability) were tested and confirmed. The path analysis of the research model relationships was carried out using the variance-based structural equation modeling (SEM) method because the model was newly created (Hair, 2011).

3.2. Data analysis

3.2.1. Qualitative analysis

Based on the followed logic of the research, the qualitative analysis of the study has been done in the first section. This section first describes the participants' characteristics (including gender, education level, and major) in the qualitative section (experts). The results show that the research's qualitative section (experts) comprises 14 men and 6 women. Regarding the education level of experts, 15 experts have a doctoral degree and 5 have a master's degree. Also, in terms of major, 9 experts studied financial accounting, and 7 experts studied cost accounting.

3.2.2. Open and axial coding

Strauss et al. (1996) define open coding in qualitative research as part of latent content analysis that labels and categorizes the data through reviewing and analyzing them. In other words, in open coding, the concepts within interviews and documents are categorized based on how they are related. Thus, in this stage, the researcher concludes that the acquired information in the qualitative data (interview+documents) is categorized based on conceptual relation. In open coding analysis, we face two different methods. In this research, we used both methods, namely detailed analysis and key

concepts analysis. In this regard, Holton (2010) states that open coding is an analytical process through which the researcher identifies the research's concepts, components, and variables. The researcher bases the categories on all the collected data, such as interviews, observations, and events or notes (Criswell, 2005).

Table 2. The process of open and axial coding

Code number	Open codes	Factor loadings
1	Managers' value beliefs	0.817
2	Personality	0.801
3	Ethical behaviors	0.844
4	Managers' tendency to show themselves as expert managers	0.823
5	Risk taking	0.848
6	Overstatement of firm size	0.860
7	The careful compliance with organizational policies	0.768
8	Fulfillingtasks without considering the personal interests	0.749
9	Using specialized scientific techniques in reporting	0.880
10	Informing shareholders	0.884
11	Reward plan	0.845
12	Increasing internal control	0.868
13	Making courageous decisions	0.844
14	Manager's responsibility	0.792
15	Management's long-term tenure	0.710
16	Shareholders' support of management	0.883
17	Choosing management based on their competence	0.855
18	Implementing rules and regulations	0.804
19	Increasing monitoring costs	0/807
20	Increasing managers' accountability to shareholders	0.777
21	The board monitoring	0.634
22	Whistle-blowing	0.699
23	Tendency to share information with stakeholders	0.809
24	Commitment to honest reporting	0.735
25	Tendency to preserve professional values	0.840
26	Prioritizing financial health in reporting	0.921
27	Paying attention to the firm's goals in financial statements and reporting	0.715
28	Using financial information and data and reporting	0.794
29	The necessity of reporting earnings	0.919
30	Disclosing additional information if necessary	0.888
31	Managers'continues reporting	0.817
32	Exchanging new information	0.913
33	Complete and comprehensive information content	0.903
34	High-quality reporting by managers	0.838
35	Collecting data constantly	0.860
36	Political-legal factors	0.778
37	Initial demand	0.807
38	Competitive conditions	0.769
39	Resource supply	0.619
40	Economic perspective	0.661
41	Tax reduction	0.653
42	The reduction in the current value of tax debts	0.824
43	Maintaining a fixed dividend policy	0.809
44	The reduction in the cost of capital	0.693
45	The increase in current assets	0.821
46	Increase in return	0.823
47	Increasing market share	0.813

48	Increase in investment	0.804
49	Transparency in reporting	0.845
50	Measurability of financial goals	0.871
51	earnings variability	0.880
52	Sales increase	0.832
53	Earnings increase	0.791

Based on Table (2), after identifying 53 open codes, the researchers undertook the axial coding and identified categories according to the grounded theory process. In the next step, the researchers identified selective codes and developed theories.

3.3. Axial and selective coding

According to the coding process of the grounded theory, after determining the indicators in the open coding stage, we systematically related subcategories to categories based on axial coding. In this stage, Jensen and Murphy (1990) state that the main categories that are more abstract are developed to create increasing knowledge about the relationships. Table (3) presents the explored open and axial codes.

Table 3. The process of axial and selective coding

Axial codes	Selective codes
Managers' ethical perceptions Managers' inner factors Professional identity	Managers' individual factors
Shareholder participation Managerial power Management stability	Management support system
Organizational monitoring and controlling system Culture Decision-making system	Intra-organizational strategies
Information quality Information Sharing Information enrichment	Information system
Political-legal factors Initial demand Competitive conditions Resource supply Economic perspective	Environmental factors
Financial information Working capital	Financial support system
Firm development Firm financial transparency Firm business value	Firm growth and development

As indicated in Table (3), the coding process of grounded theory, the process of open, axial, and selective coding finally identified seven principal selective codes, including managers' individual factors, management support system, intra-organizational strategies, information system, environmental factors, financial support system, firm growth and development were identified.

3.4. The paradigmatic model of the research

After determining the categories of the paradigmatic model, in this stage, we organized, presented, and developed research theories based on the model exploration of Strauss et al. (1996). Figure (2) indicates the conceptual model of the research organized theories.
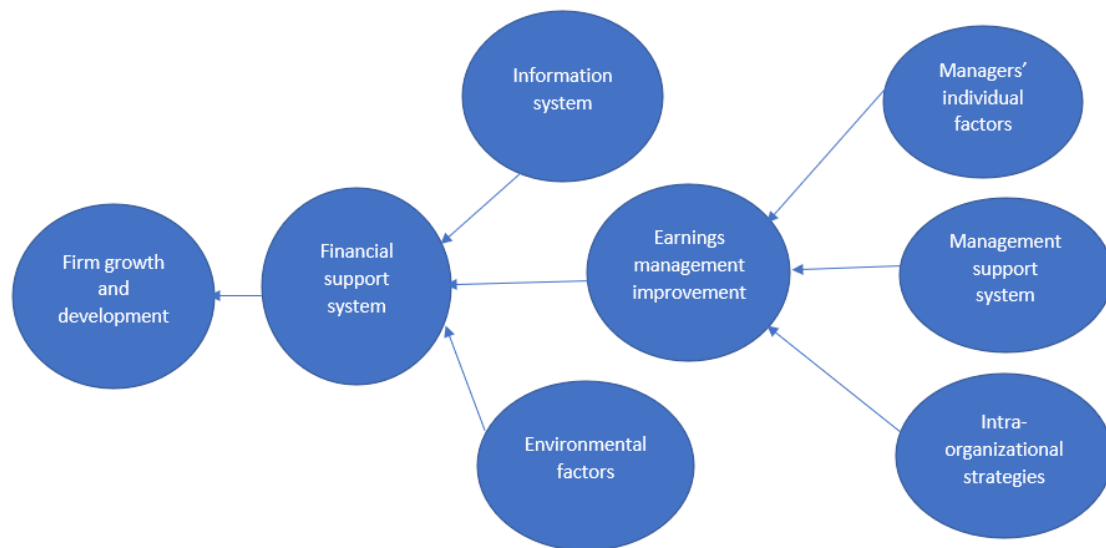

Figure 2. The explored conceptual model

Figure (2) shows the existing relationships in the research model. It can be stated that earnings management can be improved by paying attention to the factors of the research model.

3.5. Quantitative analysis

After exploring the research indicators, components, variables, and theories, we attempted to test the research model in the quantitative phase according to the mixed methods approach. In the next step, according to Hair (2011), to test and perform the path analysis of the relationships in the research model, the newly created models must be tested with a variance-based method. Thus, this section used the variance-based partial least squares structural equation modeling (PLS-SEM) method to determine the model's relationships.

3.6. Research measurement model

The PLS-SEM method provides the possibility to review the reflective measurement model statistically. According to the PLS algorithm, reflective measurement models are estimated based on the level of the correlation and the validity of indicators and observable measures. The confirmatory factor analysis shows the homogeneity of the indicators of every latent variable in the measurement model. Figure (3) indicates the implementation of the standard research model. This model makes it possible to test the factor loadings of variable measures, constructal idityindices (convergent validity + discriminant validity), and the reliability of the research model (composite reliability+ shared reliability+ Cronbach's alpha) (Balochi et al., 2017).
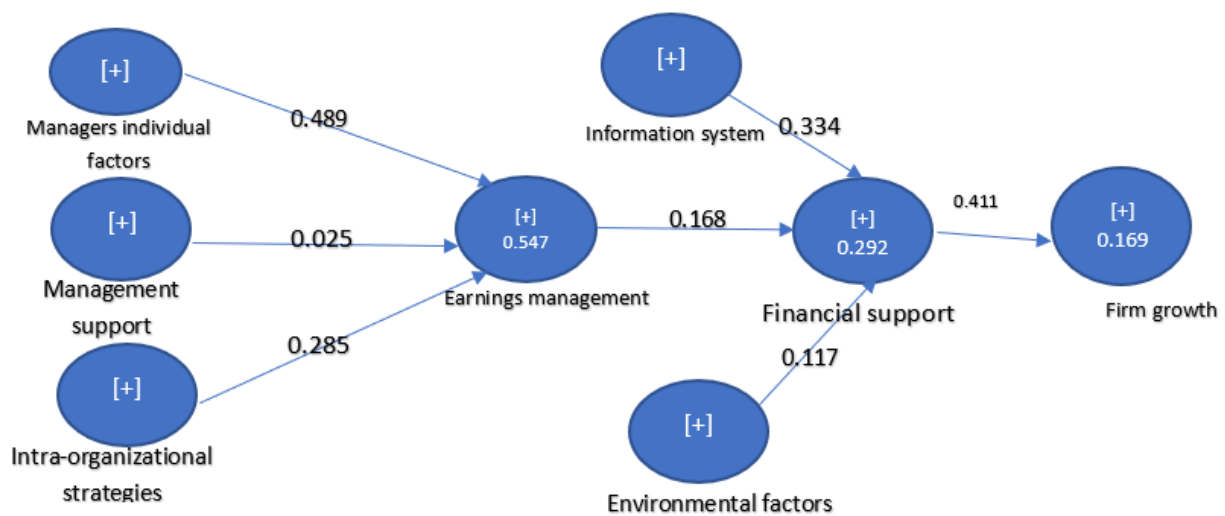
Figure 3. The standard model

In the next step, after implementing the standard model, the reliability and construct validity of the research were tested. Table (4) presents the research standard model and reliability.

Table 4. The standard model and reliability

latent research variables	Cronbach alpha	Spearman reliability	Composite reliability(CR)	Sharedreliability (AVE)
intra-organizational strategies	0.831	0.835	0.899	0.747
financial support	0.831	0.850	0.898	0.746
management support	0.771	0.778	0.867	0.686
firm growth	0.786	0.828	0.856	0.600
managers' individual factors	0.782	0.791	0.873	0.696
environmental factors	0.833	0.836	0.923	0.857
earnings management	0.776	0.790	0.868	0.687
information system	0.759	0.791	0.859	0.671

As shown in Table (4), the coefficients of Cronbach'salphafor all the research variables are greater than 0.7. As a result, the reliability of variables is confirmed by this test. Also, the coefficients of the CR of all variables are greater than 0.7; thus, the composite reliability of the model is confirmed. And the values ofAVE are greater than 0.5; thus, the shared reliability of the model is confirmed. Furthermore, as presented in Table (4), according to Hair et al. (2014 a,b), AVE≥ 0.5 and CR ≥ 0.7 and CR > AVE; thus, the convergent validity of the model is confirmed. In the next step, to address bias and correlation between the research indicators (discriminant validity), we used the *Fornell-Larcker* criterion, Table (5). The multitrait-multimethod (MTMM) matrix, Table (6), is the most critical test of *discriminant* validity; also, a comparison of composite reliability and the average variance extracted (AVE) were used to test convergent validity (Baluchi et al., 2017).

Table 5. The Fornell-Larckercriterion

The Fornell-Larcker Criterion	Intra-organizational strategies	Financial support	Management support	Firm growth	Managers'individual factors	Environmental factors	Earnings management	Information system
Intra-organizational strategies	0.864							
Financial support	0.619	0.864						
Management support	0.678	0.522	0.828					
Firm growth	0.604	0.411	0.635	0.775				
Managers'individual factors	0.691	0.534	0.982	0.643	0.834			
Environmental factors	0.566	0.408	0.597	0.542	0.603	0.926		
Earnings management	0.640	0.445	0.698	0.552	0.710	0.595	0.829	
Information system	0.615	0.505	0.698	0.584	0.714	0.571	0.620	0.819

According to Henseler, Ringle and Sinkovics (2009), the AVE of each variable should be greater than the squared correlations with all other variables. The software's output in Table (5) indicates that this test confirms the discriminant validity.

Table 6. The MTMM matrix

Heterotrait-Monotrait Ratio (HTMT)	Intra-organizational strategies	Financial support	Management support	Firm growth	Managers' individual factors	Environmental factors	Earnings management	Information system
Intra-organizational strategies	1							
Financial support	0.737							
Management support	0.844	0.644						
Firm growth	0.733	0.462	0.778					
Managers'individual factors	0.853	0.655	0.962	0.785				
Environmental factors	0.676	0.485	0.743	0.645	0.745			
Earnings management	0.780	0.532	0.883	0.653	0.892	0.733		
Information system	0.765	0.613	0.899	0.724	0.913	0.726	0.795	1

Also, Henseler, Ringle and Sarstedt (2015) developed the Fornell-Larckercriterion2015 and constructed a more reliable and complete index for testing the discriminant validity. Therefore, we used the MTMM matrix to ensure the absence of critical correlations among the indicators of constructs in the model.

As indicated in Table (6), all the two by two coefficients between variables are smaller than 1, no two variables have critical convergence, and the discriminant validity is confirmed.

3.7. Structural model

According to the structural equation modeling (SEM) algorithm, after testing the measurement model, the research hypotheses were tested based on path analysis in the significance state (Baluchi et al., 2017). Figure (4), the model in the significance state, indicates the hypotheses analysis and the explored theories of the research.
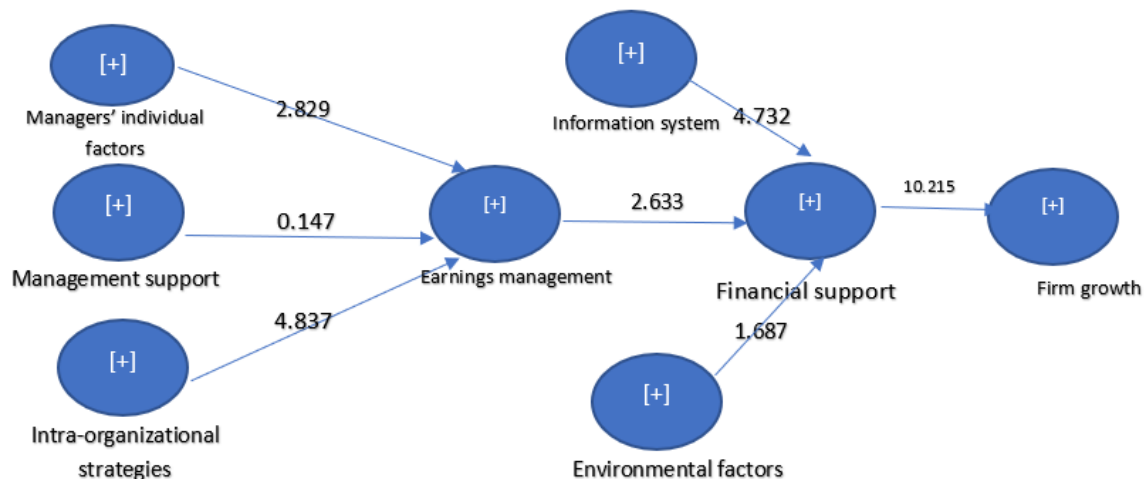

Figure 4. The research model in the significance state

Figure (4), the structural model, shows that the significant coefficients of managerial support and environmental factors are in the range (-1.96 and 1.96); thus, they are rejected. And the rest of the explored theories are outside the range (-1.96 and 1.96); thus, they are confirmed.

3.8. Fitness of the research model

Following Hair et al.(2012), we used the measurement model quality test to assess the fitness of the measurement model. This test replaces the goodness-of-fit (GoF) indices in covariance-oriented software, and the test results are presented in Table (7).

Table 7. The measurement model quality

Variables	The coefficients of model quality	Assessment
Intra-organizational strategies	0.454	strong
Financial support	0.455	strong
Management support	0.362	strong
Firm growth	0.344	Nearly strong
Managers' individual factors	0.378	strong
Environmental factors	0.447	strong
Earnings management	0.361	strong
Information system	0.342	Nearly strong

According to the results of the software output presented in Table (7), the coefficients of all the latent variables of the research are greater than or close to 0.35. Based on Cohen (1998), it can be argued that the research model is at a strong level.

4. Discussion and Conclusion

This study began with the critical question of the earnings management model appropriate for Iranian KBFs.Considerable results were obtained in this study. It should be noted that the prior research generally investigated earnings management, focusing on the pathology aspects and the measurement of accounting methods. At the same time, this study aims to improve earnings management in KBFs. To this end, 53 indicators were identified, including more than 18 components and 7 latent variables. According to the grounded theory strategy, the explored causal conditions include managers' individual factors with three sub-components of managers' ethical perceptions, inner factors, and professional identity. Also, management support with three sub-components of shareholder participation, management power, and management stability affects the improvement of earnings management. Moreover, intra-organizational strategies with three sub-components of the organizational monitoring and controlling system, culture, and decision-making system also influence factors. The structural equation modeling (SEM) results also indicate that managers' individual factors with a significance coefficient of 4.732 and intra-organizational strategies with a coefficient of 4.837 are outside the range (1.96 and -1.96). Thus, it is also confirmed in terms of positivism. But management support with the coefficient of 0.147 is in the range (-1.96 and 1.96); thus, this theory is rejected. In this section, it can be argued that if managers of KBFsshapedesired ethical perceptions and implemented good intra-organizational, earnings management in these firms would probably be improved. The identified contextual factors include information systems with three sub-components: information quality, information sharing, and information enrichment. The path analysis also shows that the significance coefficient of the information system equals 4.437. Because this coefficient is outside the range (-1.96 and 1.96) thus, the contextual role of the information system in improving earnings management can be confirmed. Therefore, the managers of KBFs can improve earnings management by enhancing information quality, sharing, and enrichment. Based on the obtained results from the identification of intervening factors, environmental factors comprise 5 indicators of political-legal factors, initial demand, competitive conditions, resource supply, and economic perspective. However, the analysis of the quantitative results indicates that environmental factors have a coefficient of 1.687, which is in the range (-1.96 and 1.96); thus, the role of the explored environmental factors is rejected. Furthermore, the financial support system with two sub-components of financial information and working capital plays a strategic role in the research model. The results obtained using the SEMtechniquealso confirm the strategic role of the financial support system because this variable with the coefficient of 2.633 is outside the range (-1.96 and 1.96); thus, it can be stated that its strategic role is accepted. And finally, firm growth with three sub-components of firm development, firm financial transparency, and firm value is the consequence of the explored model. Also, the significance coefficient of this variable equals 10.210, which is outside the range (-1.96 and 1.96); thus, the consequent role of the firm growth is confirmed. Hence, if the managers of KBFs develop their plans based on the research model, it will probably lead to improved firm growth.

4.1. Research implications

Based on the obtained results, some suggestions are proposed in this section. About influencing factors, as was mentioned in the discussion and results section, the influencing roles of managers'

individual factors and intra-organizational strategies were confirmed. Thus, it is suggested that managers' value beliefs, personalities, and ethical behaviors be considered to enhance the individual factors of managers. We suggest paying attention to values such as integrity, personal growth, and responsibility of the managers of KBFs to enhance the value beliefs of managers because these values weaken, motivate, and inspire people to succeed. Furthermore, we suggest that three sections, namely the expectations, personality structure, and managers' attitudes toward earnings management, be considered. To this end, psychological skills training can be beneficial. For ethical behaviors, we suggest that the internal oversight of managers also be improved in addition to organisational oversight. Regarding professional identity, we recommend that managers strictly follow organizational policies, fulfil their responsibilities without considering personal interests, and apply specialized scientific techniques in reporting. Thus, through informing, increasing knowledge, and supporting risk-taking, managers should be assured that there is no need to use earning management because if managers pay attention to these factors, they will be less motivated to engage in earnings management. Therefore, we can hope for an improvement in earnings management. Moreover, the results show that intra-organizational strategies are also influencing factors. In this regard, we suggest increasing monitoring costs, enhancing managerial accountability to shareholders, improving board monitoring, and encouraging whistle-blowing to enhance the organizational monitoring and controlling system as one of the dimensions of organizational strategies. Moreover, by increasing information sharing with stakeholders, honesty in reporting, and cherishing professional values, we can foster desirable corporate culture, a component of organizational strategy, in line with improving earnings management. Furthermore, the decision-making strategy can also be improved by prioritizing financial health in reporting, paying attention to the firm's goals in financial statements, and using financial information and reporting. The results confirmed the role of the information system as the contextual factor in earnings management improvement. Therefore, it is suggested that indicators such as the necessity of managers' periodic earnings reports to stakeholders, disclosing additional information by managers, if necessary, managers' continuous reporting, exchanging new information, complete and comprehensive information content, managers' high-quality reporting, continuous data collection be considered so that we can witness a change in firms' information system. Because the improvement in contextual factors helps earnings management as the central theme and desired strategies and beneficial consequences. In the present study, we identified two strategies: financial information improvement and working capital improvement. In this regard, strategies such as tax reduction, reduction in the current value of tax debts, a fixed dividend policy, reduction in the cost of capital, and increased current assets are introduced to improve earnings management. Thus, earnings management will probably improve if managers put these strategies on their schedules. According to the results, firm growth is identified as the consequence of the earnings management improvement model. Therefore, increasing returns, market share, investment, reporting transparency, measurability of goals, earnings variability, sales, and earnings can lead to firm growth resulting from earnings management improvement. Thus, if managers take action to enhance these factors, the consequent firm growth will be achieved.

4.2. Research limitations and further directions of the study

The basis of every research is the information by which the research hypotheses are tested. Thus, the higher the quality of research data, the more acceptable results are obtained and the higher the validity of the research. All research has limitations that cause problems in achieving desired results, and the present study is no exception. The present study is subject to some limitations, which are as follows. First, in exploratory research, due to coding and identifying indicators and components by

the researcher and the researcher's involvement in the research, the obtained results are likely to be affected by the researcher's personal opinion. Second, the different interpretations of experts in the qualitative phase and participants' different interpretations of questionnaire items in the quantitative phase can be a research limitations. Third, some variables that can affect the results were not controlled.

In the present study, the exploration section confirmed environmental factors and managerial support influencing earnings management. Still, in the model testing section, these factors were rejected based on the obtained results from the SEM method. Thus, we have two suggestions for future research. First, future research should conduct deeper interviews and code indicators to the point of theoretical saturation because this factor has probably created limitations in this research. Second, future research is needed to examine the effect of management support on earnings management based on the indicators of this study in another statistical population to confirm the obtained results further.

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RESEARCH ARTICLE

Analyzing the Attitude of Iranian Auditing Experts toward the Business Risk Audit Efficiency for Stakeholders

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Abstract

In evaluating a business based on the business risk audit (BRA) approach, auditors should define and perceive strategic management control techniques and operating processes. They should also select risk control processes in vital operating processes to estimate the type and magnitude of residual business risks that might affect the accuracy and fairness of financial statements. Given the international re-emergence of BRA concepts in recent years, this approach is considered an essential innovation in the auditing methodology. This study aims to analyze the attitude of Iranian auditing experts toward the BRA efficiency for stakeholders. For this purpose, a researcher-made questionnaire was designed in three dimensions: normative legitimacy of BRA, pragmatic legitimacy of BRA, and cognitive legitimacy of BRA (per dimensions of the legitimacy theory proposed by Greenwood, Suddaby & Hinings, 2002). The questionnaire was then distributed to a research sample including the Partners, Audit Org., and IACPA obtained at the end of 2021; the research results indicated that the BRA approach had normative legitimacy (m= 3.61), pragmatic legitimacy (m= 3.78), and cognitive legitimacy (m= 3.29) in Iran for the opinions of experts and statistical findings. Given the flaws and shortcomings of Iran's current auditing framework, integrating the BRA approach into the current framework will be promising. At the same time, this approach can prevent over-auditing due to its proven inherent value. It can also be considered a naturally correct method of auditing.

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1. Introduction

Audit methods have experienced many developments in the auditing profession in recent decades. The first generation of audit methods focused mainly on analysing financial statements and records for auditing, whereas the second generation was called the analytic or systemic approach. The third generation started with the audit risk approach, whereas the fourth generation is called the business risk audit (BRA) approach (Al-Qudah, 2021). As Al-Qudah pointed out the business risk assessment in auditing, auditors and clients need to consider the business risk, which monitoring institutions and standardizes have always addressed. In the latest report published by the European Confederation of Institute of Internal Auditors (ECIIA) (2020) called *Focus on Risk*, attention to business risk was put at the top of the agenda for auditing.

The emergence of BRA has resulted in a noteworthy innovation in audit methods (Van Buuren et al., 2018). From a conceptual perspective, this approach pays great attention to a wide range of business risks and gives a more comprehensive perception of clients in a structured method. In this approach, auditing is performed through a "top-down approach" method while evaluating the auditee's business risk (ABR). Compared with conventional audit approaches that focus an auditor's efforts on minimal or partial assessments of the risk of material misstatements, the BRA leads an auditor to concentrate on the comprehensive correlation evaluation. It can increase the probability of implementing effective and efficient auditing. Increasing an auditor's knowledge of the existing risks at an institutional level, this approach can facilitate further attention to the risk of material misstatement in a client's financial statements, and the disclosed relevant information. The increased knowledge can improve an auditor's assessment of the business risk caused by client communication and prevent over-auditing (De Martinis & Houghton, 2019). It can be stated that each of the Big Four audit firms (Big4) has based the diversity of their services on the abovementioned approach, which can be described as the process of conducting an institutional test in which the initiatives examine, explore, and expand the boundaries of this area (Malsch & Gendron, 2013). Although some elements of the BRA have been included in the audit standards, others have not been institutionalized yet (Van Buuren, 2014; Curtis, Humphrey and Turley, 2016). Since the BRA pays a great deal of attention to a complete set of the ABR, the audit standards require a more limited approach and attention to business risks of financial statements that probably lead to misstatements. Greenwood, Suddaby & Hinings (2002) emphasised the critical role of legitimacy and the successful change in their comprehensive model that addresses the process of changing a conventional approach into a novel one. Legitimacy is defined as a generalized perception or assumption based on the fact that the internal states of some systems of norms, values, beliefs, and social concepts are favorable, appropriate, or correct (Suchman, 1995). Within the process of this change, legitimacy necessitates identifying the reasons that justify the need for change; therefore, the proposed changes are accepted as an appropriate method of improving performance. Suchman (1995) distinguished three different forms of legitimacy: a) moral legitimacy for normative approval, b) pragmatic legitimacy (inherent value), and c) cognitive legitimacy based on perceptibility and taken-for-grantees. In these change conditions, if an innovation (approach) is consistent with the existing normative frameworks and is evaluated appropriately, it will have normative legitimacy. If a user is convinced about these changes' pragmatic and inherent values, that approach will have pragmatic legitimacy. Finally, cognitive legitimacy will be achieved if the user considers it the natural way of doing tasks (Greenwood, Suddaby & Hinings, 2002). According to Greenwood, Suddaby & Hinings (2002), legitimacy should be formed within the organizational field, defined as "a series of organizations which all form the institutional life" (DiMaggio & Powell, 1991). The organizational field of auditing in Iran can be considered audit institutes, professional associations, and monitoring institutions. This study analyzes

the attitudes of partners of Iranian audit institutions toward the efficiency and legitimacy of the BRA approach. This analysis is an essential part of the organizational field of auditing. Since legitimacy plays a vital role in the institutionalization of changes from the conventional audit approach into the novel approach, it is essential to analyze the experiences of partners of audit institutions. According to Durocher and Gendron (2014), achieving legitimacy for using an approach would lead to cognitive unity in the organizational auditing field. The formulators of standards are always concerned with developing a common audit procedure and are not willing to change the standards that are either hard to implement or are unfeasible on smaller scales (Curtis, Humphrey and Turley, 2016). The institutional change theory by Greenwood, Suddaby & Hinings (2002) proposes an efficient framework for evaluating the transformation process into BRA. For this purpose, theorizing is first implemented, which was pointed out by Van Buuren et al. (2018). Theorizing is the method of determining a problem and the novel concept of its solution. In other words, theorizing is the justification of a new concept to coordinate this concept within the existing framework and achieve normative approval (*i.e.*, normative legitimacy). If theorizing is successful, the user will observe the pragmatic value of the above approach (*i.e.*, pragmatic legitimacy). Finally, the re-institutionalisation step will accept a novel approach and concept. The new concept is accepted as the normal way of doing tasks (*i.e.*, cognitive legitimacy). Hence, three types of legitimacy should be accepted to analyze the BRA efficiency.
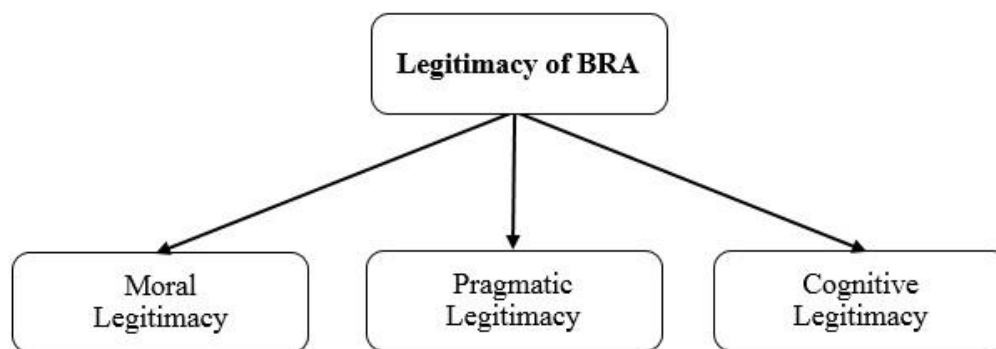

Figure 1. Explaining different types of legitimacy for BRA

The model proposed by Greenwood, Suddaby & Hinings (2002) emphasizes the role of a type of legitimacy achieved through innovation in an organizational field (*e.g.*, auditing) and its extensive acceptance. Some of the previous studies on auditing addressed the BRA innovation in countries such as Australia, Germany, the Netherlands, and the US. However, the efficiency and legitimacy of this approach have not yet been analyzed in Iran. Therefore, this study focuses on the attitudes and reactions shown by the partners of audit firms and standardizer institutions in Iran to the BRA approach.

This study collected the data through questionnaires and face-to-face interviews to analyze all aspects of the BRA approach and participants' experiences. The international professional institutions and the International Auditing Standard Boards have formulated appropriate standards such as ISA 315. However, most of these standards do not propose specific methods for auditing, although their contents facilitate the flexible (relative) acceptance of BRA. The research sample of this study included the partners of the reliable audit institutions of the Tehran Stock Exchange (Partner), some members of the Standards Formulation Committee at Iran's Audit Organization (Audit Org.), and the members of specialized working groups at Iranian Association of Certified Public Accountants

(IACPA). The research sample consisted of these three groups to obtain diverse experiences per what Patton (2015) pointed out about the effective assessment methods. This study analyzes the legitimacy and efficiency of the BRA approach for audit institutions and clients by deepening the knowledge and attitudes of audit partners, monitoring institutions, and standardizers of audit in Iran. Such studies can help academic and professional research bodies with innovation. They can also help better perceive changing approaches to a profession such as auditing.

According to the initial analyses of auditing experts' opinions, the evaluation of the ABR is essential for stakeholders (*i.e.*, not only for auditors in the audit process but also for auditees in the risk management of companies). Therefore, it is necessary to identify a method of auditing that can perform this process in the best way. They believe the BRA is a thoughtful auditing method that can implement this evaluation in Iran. Thoughtful auditing means that an auditee's business environment is evaluated thoroughly based on the dimensions of external business risk and internal business risk. In this case, the auditing workload decreases, and auditors will be efficient. In addition, the BRA can differentiate auditees with high business risk from those with low business risk, which will be very effective in the initial audit planning and allocation of audit resources. According to Iranian auditing experts' opinions, most Iranian public companies do not report their material business risks. Even if they do, their reports are limited to identifying and introducing these risks, not their evaluation. Therefore, introducing and conducting the BRA and evaluating business risks in the auditing process can benefit auditees (in identifying bottlenecks and fraud risks). However, Iranian auditing experts believe that different industries face different business risks in Iran; thus, Iranian auditors should have sufficient knowledge of the industries they are auditing. In addition, an independent auditor's business risk evaluation would require specific infrastructure that auditees should provide for independent auditors.

The rest of this paper consists of four sections. Section (2) reviews the BRA and its background and introduces the research questions. Section (3) discusses the research method. The results and findings are then presented. Finally, a research conclusion is drawn.

2. Theoretical Foundations and Research Background

The BRA approach has always been important to the research society (E.g., Abdullatif & Al-Khadash, 2010; Fukukawa & Mock, 2011; Van Buuren *et al.*, 2014; Curtis, Humphrey and Turley, 2016; Wright, 2016). Nevertheless, this approach has always had critics and doubters, especially in the small-to-medium-sectors of the accounting industry, due to its value-added (Curtis, Humphrey and Turley, 2016). This approach emphasizes the necessity of closer attention to business risks and their deeper integration into all auditing steps. The novel approach aims to enable the audit partners and their teams to gain a more comprehensive perception of the strategic risks of their clients. De Martinis and Houghton (2019) introduced the ABR as a factor consisting of five items evaluated by auditors (Figure 2).
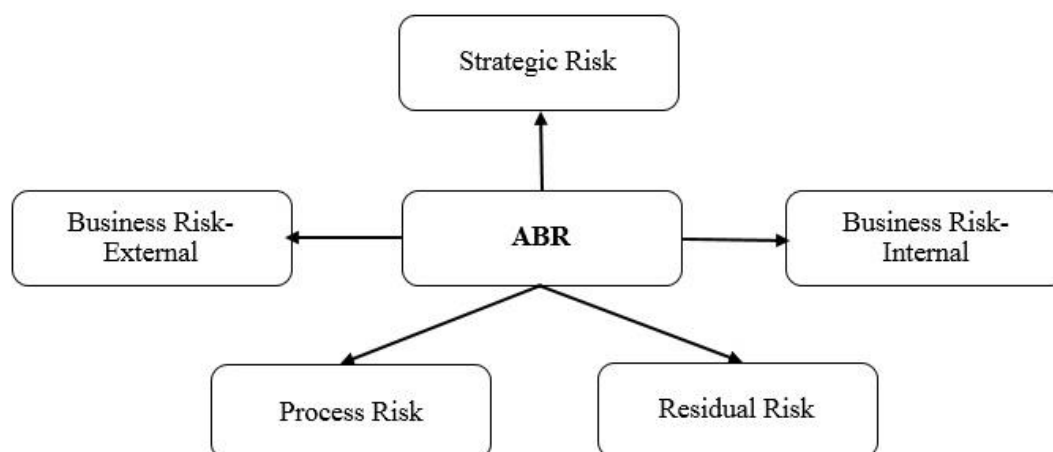
Figure 2. The dimensions of ABR evaluated by auditors (Adapted from De Martinis & Houghton, 2019)

Where:

Business risk-external assesses the risk that the entity's business objectives will not be attained du to the external (i.e., local and global), including social, political, and economic pressures and/or forces. Business risk-internal assesses the risk that the entity's business objectives will not be attained due to internal factors (i.e., organizational) pressures and/or forces. Strategic risk, which assesses the level of strategic risk, is defined as the risk that the entity's strategy and strategic management process will not achieve statutory obligations.
Process risk assesses the risk that the entity's key business processes are not fulfilling their objectives.
And,

Residual risk assesses the risk that the entity has not considered all significant business risks or the extent to which strategic and process risks remain uncontrolled.

A comprehensive client perception helps auditors improve risk assessment and interpretation of evidence obtained from the main tests. The Big4 claim that the novel auditing method (based on the business risk) must be employed to pay close attention to the dynamism and increased complexities of different business industries and environments; therefore, the BRA was developed to improve the quality of auditing (Van Buuren et al., 2018).

The importance of the BRA approach in audit planning and its relationship with the nature of necessary evidence and other approaches were explained by Van Buuren et al. (2014 & 2018) in the following four aspects:

The BRA is the head of all approaches. It means the extensive use of the business risk assessment to collect audit evidence, including evaluating the business model risks and key business processes.

The BRMM refers to the Business Risks that result in the risk of Material Misstatements. This approach includes the average and normal use of the business risk assessment to collect audit evidence by focusing on the key business processes. The primarily systems based approach focuses on the internal control systems as an essential part of the audit evidence through the limited use of the business risk assessment. The primarily substantive based approach focuses on the main tests as the major part of the process of audit evidence through the limited use of the business risk assessment.

The BRA approach is partially included in audit standards such as ISA 315 (2019), which emphasizes that "an auditor should perceive the goals and strategies of a business". This and other relevant standards explain the necessary boundaries for paying attention to business risks. Accordingly, "an auditor has no responsibility for identifying or evaluating all business risks"; however, the only responsibility of an auditor is "to identify and evaluate the risks that lead to financial material misstatements". In addition, the above standards indicate that "the business risk is more extensive than the risk of material misstatement" and that "all business risks do not lead to the risk of material misstatement". This short version of the BRA presented in "International Standards for Auditing" is what Van Buuren et al. (2014 & 2018) called the BRMM.

Table (1) presents an overview of the previous studies on BRA and their results. The research questions are then developed.

Table 1. Some of the previous studies on the BRA

Title	Authors	Case Study	Major Results
The Impact of Business Risk-Based Audit Approach on Reducing Unsystematic Risks: Evidence from Jordanian Banks	Al-Qudah (2021)	25 banks in Jordan	Al-Qudah stated that the BRA approach could mitigate nonsystematic risks' effects and improve banking performance. The BRA approach is considered with three components: external environment risk, operation risk, and information risk. The concept of nonsystematic risk is considered with operational, credit, liquidity, capital, and office risks. According to the results, the BRA approach and its hybrid dimensions significantly affected the mitigation of nonsystematic risks in the banks of Jordan. They believed that the re-emergence of the BRA approach would result in the further fixation of its position in the contemporary procedure and method of auditing. Most probably, the BRA approach will survive the next shock to the auditing industry (if any) and will again lead to certain discussions on the part
The Business Risk Audit Approach and Audit Production Efficiency	De Martinis & Houghton (2019)	60 clients in Australia	of its supporters. According to their results, the BRA approach can improve auditing quality efficiently and effectively. Moreover, the audit proceedings are efficient when they have higher levels of "audit technology", *i.e.*, there are longer activity hours of risk perception, further judgmental plans, and more auditors with above 10 years of work record.
The Effect of Risk Dimensions on Audit Pricing	Azinfar et al. (2019)	85 companies listed on the Tehran Stock Exchange	They did not address the BRA directly but reported a significant relationship between audit fees and financial and operational risks. However, there was no evidence of a significant relationship between business risk and audit fees.
Technical Inefficiency, Allocative Inefficiency and Audit Pricing	Chang et al. (2018)	165 clients audited by the Big4	It is important to know that auditing contracts or fees analyze a few studies on audit production efficiency. The authors stated that an advantage of analyzing the contracts of only one audit institution was the possibility of considering the auditor's unmeasured characteristics, such as technology and auditing style affecting the audit

Title	Authors	Case Study	Major Results
Standards of Innovation in Auditing	Curtis, Humphrey and Turley (2016)		production. They believed that the globally vital role of audit institutions increased the importance of perceiving efficiency in this industry along with the shortage of skilled workers and the downward pressure on costs. They stated that the concept of the BRA gained a new concept. Technological developments and the extensive domains of financial reporting, such as integrated reporting and the necessity of considering business sustainability, made the BRA approach popular. Moreover, the studies of behavioral auditing indicated evidence that the BRA would improve the efficiency of audit judgments.
Integrating Business Risk into Auditor Judgment about the Risk of Material Misstatement: The Influence of a Strategic-Systems-Audit Approach	Schultz *et al.* (2010)	44 auditors in auditing institutions in the US and 49 auditors in other institutions	They proposed the evidence that the BRA approach could increase an auditor's attention to business risks, for it is more probable that business risk is directly considered in planning to judge the risk of material misstatement.

2.1. Research Questions

Theorizing plays a significant role in developing innovation or a novel approach. Theorizing means pointing out particular failures or problems/shortcomings in the existing versions and visualizing the new concept as the solution (Tolbert & Zucker, 1996). The framework proposed by Greenwood, Suddaby & Hinings (2002) emphasizes the role of theorizing in achieving change. This conceptual framework helps facilitate the normative acceptance of changes (*i.e.*, normative legitimacy) to support the novel ideas within the framework of the existing solutions (Suchman, 1995; Tolbert & Zucker, 1996). A significant reference for the evaluation of theorizing in the Big4 auditing institutions would be their published monographs (*e.g.*, KPMG, Bell *et al.*, 1997; Bell *et al.*, 2005). Bell *et al.* (2005) stated that innovations in information technology would change the business atmosphere and make it more efficient and effective, reducing the use of the (conventional) methodology.

Nevertheless, previous studies indicate that auditors have difficulty developing novel approaches even in the Big4 auditing companies (Van Buuren et al., 2018). The emergence of the BRA can be considered an attempt to legitimize the development of auditing. This change will have certain outcomes for constructing and reconstructing socioeconomic and political relationships in auditing.

We are interested in realizing what changes the auditors have determined in response to some shortcomings of the current auditing method in Iran (the conventional method in many countries) and how promising they consider integrating the BRA approach into the current auditing methods. These concepts were used to develop the first research questions regarding the normative legitimacy and change toward the BRA.

At the same time, the big auditing institutions developed the BRA as a useful method for improving auditing quality (De Martinis & Houghton, 2019). The business risks were analyzed extensively under this novel approach to propose a more comprehensive view helping both auditing effectiveness (identification of errors) and auditing efficiency (reduction of main tests and prevention of over-auditing). If the stakeholders accept that the novel approach is useful (pragmatic legitimacy), new concepts will be disseminated more extensively.

In addition, improving the inter-professional level of auditors in the audit community may help the pragmatic legitimacy of new risk standards. In other words, the auditors wish to communicate with the big auditing companies through auditing methods at the small-to-medium audit institutions and adapt to the international standards on auditing (ISA) to identify themselves as high-quality auditors (Samsonova & Tadi, 2013).

Nevertheless, implementing the BRA would be challenging due to the diversity of industries and businesses. Even the Big4 auditors sometimes use the BRA only as "additive methods" because auditors might not be willing to reduce the conventional auditing methods. This behavior leads to "over-auditing" which indicates auditing inefficiency. Moreover, an auditor's request to become aware of a company's strategic plans is different from the batched observation of statements. Thus, convincing the stakeholders, especially the clients, about the usefulness of the BRA is a new challenge necessitating establishing appropriate relationships between clients and stakeholders.

As discussed earlier, the BRA approach was included partially in auditing standards, *e.g.*, AS 5, ASA 315, ISA 315, and ISA 330. This dissemination and penetration of business risk views in the auditing performance and procedure through professional standards would indicate that the novel approach has gained the minimum degrees of pragmatic legitimacy in auditing organizations. Furthermore, the penetration and dissemination of this view can help pragmatic legitimacy. If innovations are more structured and objectified, their perceived values can improve through the effect of pragmatic legitimacy and further dissemination (Tolbert & Zucker, 1996; Greenwood, Suddaby & Hinings, 2002).

Hence, we are interested in knowing whether Iranian auditors accept the shortcomings of the current auditing methods and start seeing the value of evaluating business risks in audit proceedings. These concepts were used to develop the second research question regarding pragmatic legitimacy and the inherent value of the BRA.

Finally, auditors must avoid the classic approach and believe that the novel concept is the natural auditing method. Hence, the institutionalization and comprehensive but sustainable adoption of the new concept will necessitate changing the mindset. Moving toward the BRA requires a change in paradigms. This study analyzes how Iranian auditors consider the BRA from the legitimacy perspective. As the BRA is partially included in auditing standards, the question is whether some auditors have started to perceive the BRA approach due to having a high level of cognitive legitimacy. In particular, we are initially interested to know how much the auditors have changed their mindsets to move towards the BRA. Regarding those auditors who have used the main elements of the BRA in their proceedings or know its concepts completely, we then analyze whether they now consider the BRA a natural and normal method of auditing. These concepts were considered to develop the third research question regarding the cognitive legitimacy and acceptance of the BRA as a natural auditing method. Hence, the research questions are presented below:

RQ1. Does the BRA approach have normative legitimacy in Iran?

RQ2. Does the BRA approach have pragmatic legitimacy (inherent value) in Iran?

RQ3. Does the BRA approach have cognitive legitimacy in Iran? Can it be considered a natural method of auditing?

3. Research Methodology

This is a fundamental exploratory survey in which a qualitative approach was employed to provide a basis for the statistical sample. Qualitative studies help researchers enter the specialized worlds of participants and indicate their opinions and experiences regarding specific subjects (Power & Gendron, 2015). A researcher-made questionnaire was used for data collection. For this purpose, the research literature on the BRA was reviewed accurately in addition to using the dimensions of the legitimacy theory (Greenwood, Suddaby & Hinings, 2002) and considering the environmental conditions of Iran. First, a 20-item questionnaire was designed with the Likert scale in three sections (*i.e.*, normative legitimacy of the BRA, pragmatic legitimacy of the BRA, and cognitive legitimacy of the BRA). The questionnaire was distributed to two Partners, two members of audit Org., and two faculty members specializing in auditing research. After discussion, one item was deleted, and the texts of the two items were changed. Finally, a 19-item questionnaire was approved for distribution among the final research sample.

The content validity was used to evaluate the validity of the questionnaire. It refers to a kind of validity employed to analyze the constituents of a measurement instrument. The content validity of a measurement instrument depends on its constituent items. The test has content validity if the questionnaire items represent the special features and skills the researcher intends to measure. Moreover, the content validity of a test is usually determined by experts. As discussed earlier, the questionnaire items were designed through the exchange of thoughts between executive experts and standardizers, who then approved the questionnaire. Therefore, it has the necessary validity. It should also be stated that the questionnaire was distributed among eight experts who filled it out to evaluate reliability and validity. Table (2) reports the reliability analysis results through Cronbach's alpha. Since this coefficient is above 0.7, all three sections of the questionnaire and the entire questionnaire meet the adequate reliability requirement to evaluate the research subject.

Table 2. Results of Cronbach's alpha

Questionnaire	No. of Questions	Cronbach's Alpha
The moral legitimacy of BRA	5	0.745
Pragmatic legitimacy of BRA	9	0.719
Cognitive legitimacy of BRA	5	0.828
All	19	0.706

The statistical population included Partners. As mentioned earlier, Audit Org. and IACPA were also considered the standardizer institutions for effective evaluation (Patton, 2015). The statistical sample was selected for the following conditions to acquire appropriate, accurate, and effective information:

1- They should have at least 10 years of executive experience in auditing.

2- They should be selected from Partners, Audit Org, and IACPA.

3- They should be scientifically and executively experts.

    After meeting the above conditions, they should be completely acquainted with implementing the BRA and the specialized concepts in an initial interview between the researcher and experts.

After the above conditions were applied, a few eligible participants were identified. The researcher then started distributing the questionnaire. Moreover, the questionnaires were completed in person, and the interviews were conducted face-to-face from June to December 2021. At the end of each questionnaire, every expert was asked about the next expert to fill out the questionnaire by describing the above conditions. Eventually, 31 experts were determined for the demographics in Table (3). They completed the questionnaire.

Table 3. Demographics of the statistical sample

Row	Country	Audit Exp. {year}	Rank	Education	Gender
1	IR	Over 20	Partner	PhD	Male
2	IR	16	Partner	PhD	Male
3	IR	18	Audit Org.	PhD	Female
4	IR	Over 20	Partner	MA	Male
5	IR	Over 20	Partner	BA	Male
6	IR	20	Partner	MA	Male
7	IR	18	IACPA	PhD	Male
8	IR	16	Partner	PhD	Male
9	IR	Over 20	Partner	BA	Male
10	IR	Over 20	Partner	BA	Male
11	IR	Over 20	Partner	MA	Male
12	IR	15	Audit Org.	PhD	Female
13	IR	Over 20	Partner	MA	Male
14	IR	19	Partner	PhD	Male
15	IR	11	Partner	MA	Male
16	IR	15	Partner	MA	Male
17	IR	11	Partner	PhD	Male
18	IR	14	Partner	BA	Male
19	IR	15	Partner	MA	Male
20	IR	14	Partner	MA	Male
21	IR	Over 20	IACPA	BA	Male
22	IR	11	Partner	PhD	Male
23	IR	Over 20	Partner	PhD	Male
24	IR	Over 20	Partner	PhD	Male
25	IR	11	Partner	PhD	Male
26	IR	20	Partner	PhD	Male
27	IR	12	Partner	PhD	Male
28	IR	Over 20	Partner	PhD	Male
29	IR	Over 20	Partner	PhD	Male
30	IR	Over 20	IACPA	MA	Male
31	IR	Over 20	Partner	MA	Male

    According to Table (3), the statistical sample included 26 Partners, three members of IACPA, and two members of audit Org. Furthermore, 16 participants had PhDs, whereas ten and five had MA and BA degrees, respectively. Regarding work experience, the highest frequency was about 14

participants with more than 20 years of record. According to the analysis results in Iran, all participants were Iranian.

4. Results

This section analyzes the research results. Due to the use of an exploratory approach and the presence of research questions, it is merely necessary to compare means and interpret experts' responses to analyse questions. For this purpose, a mean of 3 will be considered the ineffective index and used as the criterion for analyzing the research questions due to the spectrum of items and three sections of the questionnaire design on a five-point Likert scale. The Friedman test will then be employed to rank each factor. Moreover, the research findings were provided to three experts (one Partner, one member of audit Org., and one member of IACPA) for revision and confirmation.

5.1. Analyzing the First Research Questions

The first research question asks whether the BRA approach has normative legitimacy in Iran. Table (4) reports the descriptive findings on this question.

Table 4. Results of normative legitimacy of the BRA

Dimension	Min	Max	Mean	SD
The moral legitimacy of BRA	2.600	4.800	3.610	0.624

The mean of 3.61 was obtained from 31 questionnaires for the normative legitimacy of the BRA. It is greater than the mean of 3; therefore, it indicates that the experts gave positive answers to the first question. In other words, using the BRA approach for auditing has normative legitimacy in Iran. According to the results of the first question, the following essential details were provided directly by the experts. Like what was mentioned in the theoretical foundations for designing this question, theorizing (shortcomings and flaws of the current auditing approach) is essential and was discussed by many experts in the research sample. For instance, one expert stated, "From a conceptual standpoint, assume that the current auditing approach remains active. In this case, if you lack sufficient concentration, there is still the risk of losing important details in auditing." Another expert stated, "When you have to finalize your auditing commitments and reporting until October 22 (30 Mehr in the Persian calendar) while you still have 50 auditing commitments, the current approach, which requires a great deal of time on each audit, will not work. This is where the novel approach can be effective".

Regarding the current approach, the above experts mentioned the problems of effectiveness (the first quote) and efficiency (the second quote). Although these quotes do not indicate whether a full-scale BRA plan is required to solve the abovementioned problems, they refer to some shortcomings and flaws of the current approach. However, other factors apart from the comprehensive assessment of the client business risk by auditors can be considered in Iran (the client–auditor relationship) about the efficiency problem. These factors can delay reporting the audited financial statements or lead to

the duplication of audits (several clients) by an independent auditor in the short remaining time. These factors include the untimely delivery of clients' unaudited final financial statements or the multifold moderation and registration of some unregistered events after the financial statements are delivered to the independent auditor. Another problem is the insufficiency of efficient human resources in audit institutes in proportion to the input workload. The massive input workload of an institute and the lack of constraints on work reception can highlight the previously mentioned problem. Accordingly, shortcomings and flaws are evident in Iran's current audit approach. Moreover, the results indicate that the experts accepted the normative legitimacy of the BRA approach. What matters is the perceptibility of the novel approach. Regardless of standardization and immediate implementation, specialized training should be provided for the audit institutions' employees to use and comprehensively realize the normative legitimacy of this approach. Creating normative legitimacy through theorizing necessitates formulating an understandable abstract framework to realize the effective conveyance of concepts in the novel approach.

5.2. Analyzing the Second Research Question

The second research question asks whether the BRA approach has pragmatic legitimacy (inherent value) in Iran.

Table (5) reports the descriptive findings on the second question.

Table 5. Results of pragmatic legitimacy of the BRA

Dimension	Min	Max	Mean	SD
Pragmatic legitimacy of BRA	3	4.780	3.780	0.456

The mean of 3.78 was obtained from 31 questionnaires for the pragmatic legitimacy (inherent value) of the BRA approach. It is greater than the mean of 3; therefore, the experts have positive answers to this question. In other words, using the BRA approach for auditing has pragmatic legitimacy and inherent value in Iran. Similar to the analysis of the first question, a few detailed experts' responses to the second research question are presented. As mentioned in the theoretical foundations for designing this question, the dissemination and penetration of business risk views in the auditing performance and procedure would first be important through professional standards. Secondly, audit production efficiency is essential. In this regard, an expert stated, "Changing to use the BRA is a noteworthy change. This auditing framework includes many checklists and countless questions that the International Standards can formulate on Accounting". Another expert stated, "Considering the client levels in business risk at first, the BRA approach consumes shorter auditing periods and requires fewer specialized resources. The novel approach informs us that we can do the tasks correctly". A third expert stated, "All companies must have risk management committees. Recently, the TSE-listed companies have published their risk management committee reports per the requirements and mention all the risks that can threaten a company's and its stakeholders' goals. It is important to assess these risks. If an auditor is assessed correctly, they can be used the most widely by clients and stakeholders. However, the client should implement this assessment, and the auditor should evaluate its sufficiency and reliability".

The first quote indicates that referring to "auditing standards" and checklists would mean the more official use of the BRA. The requirements of legislating institutions can first be employed to adopt this approach. It can then turn into an auditing culture gradually. The second quote indicates the efficiency of this approach to audits, whereas the third approach refers to the main application of this approach for stakeholders. However, some considerations are also of importance in the pragmatic legitimacy of this approach. For instance, the complete implementation of the above audit depends on the client's industry and special conditions. If the internal controls do not act effectively, it will be impossible for some clients to implement the BRA approach fully. Hence, if the internal control system is weak, auditors will be driven toward the conventional method, which is time-consuming. In practice, these clients will be deprived of auditing services in the novel approach. According to the above quotes, it is valuable to consider the business risk assessment in audits. Furthermore, experts' opinions show that the business risk views penetrated the audit procedures through professional standards and prevented over-auditing. The survey results indicate that the experts accepted the pragmatic legitimacy of this approach.

5.3. Analyzing the Third Research Question

The third research question asks whether the BRA approach has cognitive legitimacy in Iran and is considered a natural auditing method. Table (6) reports the descriptive findings on the third question.

Table 6. Results of cognitive legitimacy of the BRA

Dimension	Min	Max	Mean	SD
Cognitive legitimacy of BRA	2	4.800	3.290	0.831

The mean of 3.29 was obtained from 31 questionnaires for the cognitive legitimacy of the BRA approach. It is greater than the mean of 3; therefore, the experts gave positive answers to this question, and using the BRA approach for auditing has cognitive legitimacy in Iran. It can be considered a natural method of auditing. Like the two previous questions, a few opinions of experts are quoted directly in detail. Similar to what was designed in theoretical foundations for this question, it is essential to change auditors' mentality to institutionalise an approach. For this purpose, some opinions of experts are presented. An expert stated, "The BRA approach is another way of thinking about auditing. What matters is to have the right mindset". Another expert stated, "The auditors should write the most important problems of a company on two or three sheets. They should repeat this process. It helps clarify a company's business, shareholders, and target market. In other words, we should have a mindset approach". These quotes indicate that some experts seriously revised the methods they had experienced and were interested in the BRA approach. Especially the last quote suggests that the mindset change might be intellectually challenging. Similarly, another expert stated, "It has been challenging for an elder auditor to start auditing a company using an audit program. It might take years to forget the conventional approach. Some old-hand auditors can never quit the conventional approach; however, their mindsets should be changed one way or another". Although institutionalizing the BRA approach necessitates changing the mindset, many experts emphasized the necessity of providing auditors with new training to make a change. For instance, an auditor stated,

"Most of the auditors are not well-trained and might not be able to identify all main points of business risks in a company; thus, we need skilled executive trainers and an appropriate plan to make this auditing approach universal". Hence, training is a prerequisite to the transformation of auditing in this dimension. It helps redefine the specialized boundaries of auditing and drives it toward consultation. In brief, the experts who changed toward the BRA often discussed the subjects of the change of mindset. The mind is considered an essential element in institutionalising a novel approach. Many experts confirmed that the BRA is the right method of auditing. They did not disagree with their assessment that at least some of the BRA principles are the "natural" and "correct" auditing methods.

The above opinions and the previously presented statistical results indicate that the experts accepted the cognitive legitimacy of the BRA approach.

5.4. Friedman Test

After the results of analyzing the research questions were presented, each legitimacy dimension of the BRA was ranked by using the Friedman test (Table 7).

Table 7. Results of the Friedman test

Dimension	Mean of Rank	Rank
The moral legitimacy of BRA	2.060	2
Pragmatic legitimacy of BRA	2.130	1
Cognitive legitimacy of BRA	1.810	3

According to the mean of rank obtained from the Friedman test, pragmatic legitimacy was ranked first, whereas normative legitimacy and cognitive legitimacy were ranked second and third, respectively. The resultant ranks are consistent with the consequent mean of responses from 31 experts. As pragmatic legitimacy had the highest mean, it was ranked first on this test. Therefore, it can be stated that the experts were unanimous about the pragmatic legitimacy (inherent value) of the BRA approach more than the other dimensions of legitimacy.

5.5. Structural Equation Modeling

Finally, structural equation modeling (SEM) was adopted to present the relationships between the legitimacy dimensions of the BRA approach. Figure (3) demonstrates the SEM framework indicating the relationships between the legitimacy dimensions of the BRA approach (Factor loading and T-Value). Furthermore, Table (8) presents the SEM results and the correlations of the legitimacy dimensions and their significance levels.
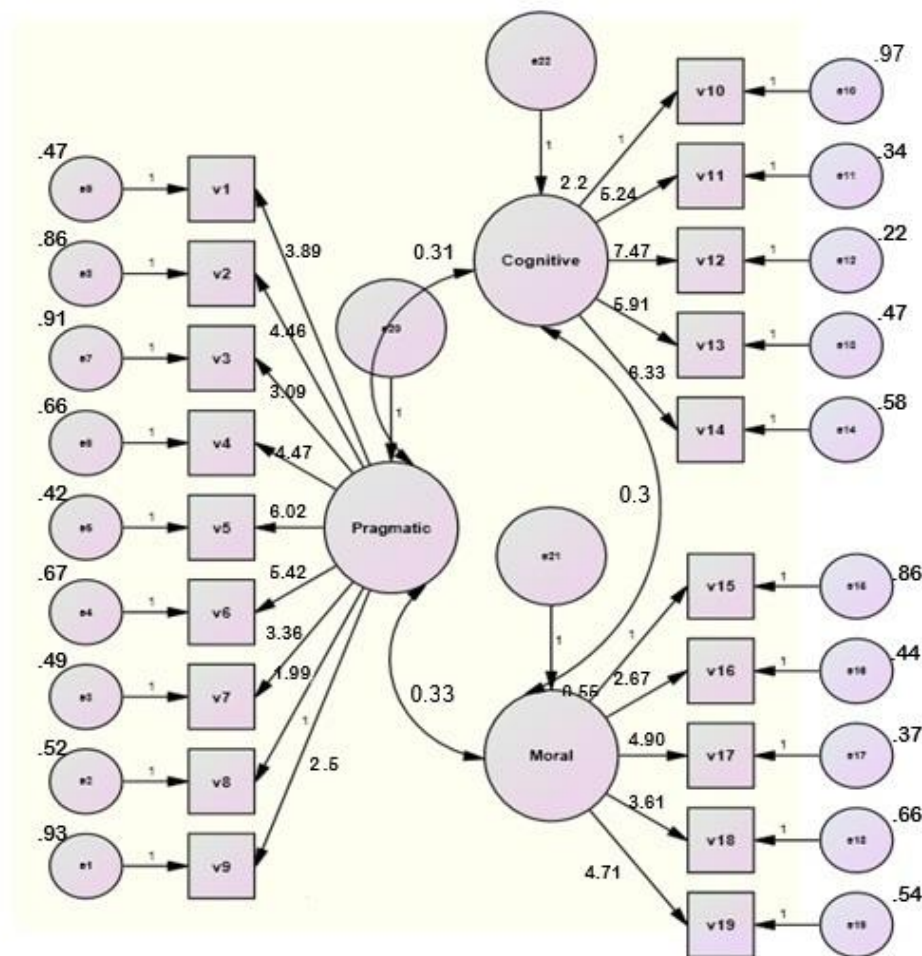

Figure 3. Structural equation modeling

Table 8. The fitness results of the SEM

Relationships of Legitimacy Dimensions	Correlation	P-value
Pragmatic Legitimacy < -- > Moral Legitimacy	0.33	0.000
Cognitive Legitimacy < -- > Pragmatic Legitimacy	0.31	0.003
Moral Legitimacy < -- > Cognitive Legitimacy	0.30	0.005

According to Table (8), there were significant correlations between all dimensions. They all had significant relationships (because the significance level of each two dimensions was below 0.05). Also, the T-Value between the dimensions of legitimacy and the sub-criteria of each are all above 1.96, which shows that the criteria for measuring the main dimensions are also significant.

5. Conclusion

The BRA focuses on an auditor's further learning of a client's strategies, operations, and work environment to determine whether financial statements have been presented fairly. Through evident effects, this can improve an auditor's ability to identify the risks that directly and indirectly affect

financial statements. This study analyzes Iranian auditing experts' attitudes toward the BRA approach's efficiency for stakeholders. As discussed earlier, specific constraints were applied to select the experts. Finally, the research subject was analyzed through 31 questionnaires completed by experts in 2021. According to the scientific outcomes, the BRA approach can be useful in creating efficiency in auditing, for auditors focus on the comprehensive and complicated risks of financial reports at an institutional level. This knowledge can improve the process of selecting the methods of auditing and supplying auditing resources without wasting time or irrelevant auditing. Such a comprehensive perception of a client is an instrument that helps auditors improve risk assessment and the evidence from main tests. The Big4 stated that it would be necessary to employ the BRA approach to pay complete attention to the dynamism and increased complexity of different business environments and industries. From this perspective, the BRA approach is developed to improve auditing quality. The institutional change framework proposed by Greenwood, Suddaby & Hinings (2002) was adopted to analyze the efficiency of this approach in Iran. This theory provides an opportunity to perceive auditors' experiences and attitudes toward the BRA's success and efficiency in achieving the dimensions of legitimacy (normative, pragmatic, and cognitive). Hence, the research questions were based on these dimensions. The normative legitimacy (theorizing change toward the novel approach) analyzed the shortcomings and flaws of Iran's current auditing approach and its integration into the BRA approach. The pragmatic legitimacy (inherent value) analyzed the dissemination and penetration of business risk views in the auditing performance and procedure through professional standards and audit production efficiency. Finally, the cognitive legitimacy (natural auditing method) analyzed changes in auditors' mindsets to institutionalise the novel approach.

Regarding the first research question (normative legitimacy of the BRA), the results indicated that the mean of responses was 3.61, which is greater than the ineffective mean of 3 (based on the five-point Likert scale). In this regard, a few opinions of experts were also quoted for more accurate analysis. The results suggested that Iran's current auditing approach had shortcomings and that the experts accepted the normative legitimacy of the BRA approach. Regarding the second research question (pragmatic legitimacy of the BRA), the results indicated that the mean of responses was 3.78, which is greater than the ineffective mean of 3. Moreover, a few opinions of experts were quoted for more accurate analysis. The results suggested the BRA's value in audits and the penetration into auditing procedures through standards. Hence, the experts accepted the pragmatic legitimacy of the BRA approach. Finally, regarding the third research question (cognitive legitimacy of the BRA), the results indicated that the mean of responses was 3.29, which is greater than the ineffective mean of 3. In this regard, a few opinions of experts were quoted for more accurate analysis. According to the results, the institutionalization of an approach would necessitate changing auditors' mindsets. Many experts confirmed that the BRA would be the natural auditing method. Therefore, the statistical results indicate that the experts accepted the cognitive legitimacy of the BRA. Regarding these three dimensions, experts emphasise training the auditing personnel to be acquainted with the client's business risk assessment skills and internal control system. The presence of technology such as auditing programs, which are now commonly used in the leading countries at an international level

to conduct audit processes, can greatly help implement this approach appropriately in Iran. Since there are no similar studies in Iran, comparing the results with their domestic counterparts is impossible. However, the results were consistent with the findings of international studies conducted by De Martinis and Houghton (2019) and Van Buuren et al. (2018) in terms of the fact that the BRA can improve audits and prevent over-auditing.

According to Van Buuren et al. (2018), who evaluated this method in Germany and the Netherlands with 39 experts, the audit companies interested in making changes must try to perceive the BRA. They also have to share these changes to make their colleagues aware of its values, which requires training. Moreover, it is stated that the audit companies having many auditees and work commitments that needed to be done in specific periods had to leave behind the conventional approach (due to its inefficiency) and start using the BRA. These opinions indicate an emphasis on acquiring ABR evaluation skills and BRA efficiency in Germany and the Netherlands, like Iran. However, some other experts in these two countries believe that they have not used all of the BRA tools and that the conventional auditing approach and correct evaluation of inherent risk might be sufficient in some industries and small and medium-sized enterprises (SMEs) in Germany and the Netherlands due to the inappropriate control structures. This is also true in Iran, for many SMEs lack official control and top-down structures. De Martinis & Houghton (2019) analyzed the BRA for 60 Australian auditees and stated that the audit contracts were much more efficient after implementing the BRA approach than before the BRA was implemented. This finding was more evident in the Australian auditees with lower business risks. As a result, it can be concluded that implementing the BRA approach can improve audit production efficiency. According to the analysis of the BRA among Australian auditees, no cases of over-auditing (audit inefficiency) were observed in the BRA implementation. Like Iranian experts, they also believed that the ABR evaluation necessitated considering all aspects of internal and external business risks and evaluating strategic, process, and residual risks.

Implications

The business risk status and business risk assessment by auditors should be updated in every period (year), for the risk status in an organization, especially in Iran, changes alternatively as the economic environment of that organization and other environmental conditions (*e.g.*, currency exchange rate and inflation) change. At the same time, a major part of Iran's economy is owned and run by the government; thus, international economic fluctuations can have additional effects on the activities of businesses and their risks. In this case, the business risk assessment of a particular time will not necessarily be reliable in the future (*i.e.*, a continuous approach to business risk assessment). In practice, independent auditors should have the specific infrastructure, which should be provided for them by clients, to employ the business risk assessment. This infrastructure includes a company's financial information. Iran's Securities and Exchange Organization (SEO) ensures the actionable guarantee for providing information in a platform of interest, including all the TSE-listed companies and their subsidiaries (listed and unlisted companies). The efficiency of the organization can double in this case. Therefore, the SEO is advised to formulate the necessary instructions for the requirements of the companies above within the necessary periods. The SEO is also recommended to formulate uniform coding bands and announce them as instructions to these companies within the above periods

to improve the proposed platform by developing specialized working groups. It will also be effective to create a domain accessible for the reliable audit institutes of the Tehran Stock Exchange and all investors on the proposed platform for business risk assessment. The IACPA and Audit Org. should provide the actionable guarantee that the independent auditors implement the audit processes based on the BRA; therefore, the firms will be committed to employing this approach. For this purpose, the abovementioned institutions are advised to determine how much the business risk instruments were used by institutes and what appropriate scores should be assigned to them when evaluating these audit firms. Regarding the importance of business risk and the necessity of audit institutes in conducting audit processes based on business risk, the IACPA is recommended to refuse to admit clients who fail to provide risk assessment reports or insert the initial information into the platform. The BRA can also yield effective outcomes for audit institutes and prevent the accumulation of auditing tasks within a specific period. It can also make the audit tasks efficient and effective. Finally, the quality of auditing reports will be higher than the conventional auditing approach, and stakeholders will incur lower costs.

This study analyzed the BRA and its efficiency in Iran and evaluated its legitimacy appropriate in Iran's environment. Since different industries face various business risks in Iran, conducting specific case studies on the BRA of different Iranian industries is recommended to expand this study. In addition to identifying the BRMM in a specific industry, it can lead to the purposiveness of the use or non-use of the BRA for independent auditors in respective companies.

Limitations

This study was conducted in certain circumstances when Covid-19 and its consequent restrictions were present in Iran, which affected the face-to-face interviews and completion of questionnaires. In addition to prolonging the research process, this constraint prevented three experts from participating in interviews and filling out the questionnaires. Despite all constraints, all interviews were conducted in person because the statistical sample had to be selected from special experts to acquire extensive results.

Acknowledgement

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RESEARCH ARTICLE

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ARTICLE INFO

Abstract

With the growth and development of theoretical approaches in the field of behavioral, the importance of participation and cooperation of individuals within organizational structures to improve the level of practical functions has increased daily. Recognizing the axes that enhance the organisation's effectiveness, such as professional voice, has been essential research in recent years. The purpose of this study is to investigate the effect of the motivational principles of individual behavior voice on the professional ethics of internal auditors by understanding the conceptual and theoretical understanding of professional voice in auditing and recognising the functional and behavioral nature of internal auditors. The final sample of this study is 183 internal auditors of Iranian listed firms in 2020. The research tool is a questionnaire, and partial least squares analysis is used to fit the model and test the research hypotheses. The results of testing the research hypotheses show that self-efficacy, level of hope, and resilience, as the criteria of the stimulus process in the voice of individual behavior have a positive and significant effect on the moral courage of the internal auditor. These results suggest that if behavioral incentives are considered, auditors' level of behavioral audacity in more realistically disclosing the financial performance of their companies can be expected to increase. It should also be noted that this study's results can increase the effectiveness of internal auditors' functions and their behavioral knowledge in the direction of professional functions.

NUMBER OF REFERENCES
73

NUMBER OF FIGURES
3

NUMBER OF TABLES
7

1. Introduction

The consequences of human activities and their performance are critical components determining organizational success. The quality of such outcomes consequently affects organizational

performance. As the primary source of sustainable competitive advantage in organizations, human resources should be held accountable and assist the organization in likely crises by participating, posing new ideas and thoughts, and involving others. In this regard, employees, the primary source of change, learning, and creativity in organizations, should share their information fearlessly. Their deliberate avoidance of sharing relevant knowledge and ideas about organizational performance would eventually become a career plateau because of the silence prevailing in organizational structures. Like any human resource in organizations, auditors, either internal auditors or audit committee members, are no exception. Accordingly, one of the central policies and strategies should be considered, and their intrinsic motivations should be met in line with human resource strategies (Mahdavi & Zamani, 2018). In recent years, as one of the main organizational strategies in line with the success of human resources, the need to improve, train and develop internal auditors' skills has been of great concern. This has been aroused by the need for the evolutionary growth of internal auditing and the profile changes of internal auditors in the modern world, which has provided them with a smoother career path (Hass, Abdolmohammadi and Burnaby, 2006; Harrington, 2004). The critical role of internal auditing in society has made it one of the most complicated professions. Accordingly, as members of the profession, internal auditors are committed to being considerate of the interests of their clients. Researchers and experts regard moral behavior as the main prerequisite for the survival of any profession, including internal auditing (Mahdavi & Ebrahimi, 2013). Internal auditors are constantly exposed to ethical issues that may challenge their standards. They also may face conditions where they have to speak out despite the pressure posed by senior managers. On the other hand, they also can play a crucial role in promoting the organization's ethics (O'Leary & Stewart, 2007). According to previous studies, internal auditors can better detect fraud and corruption than independent auditors (Halbouni, 2015; Jayalakshmy, Seetharaman & Khong, 2005). This is while the internal auditors are either reluctant or do not dare to disclose deviations or fraud in the financial statements (Khelil et al., 2018b). According to many studies, given the interference of auditing operations in organizations' management environment, internal auditing is influenced by management decisions, and this can be considered the main reason why auditors are silent in doing their tasks professionally (Cassematis & Wortley, 2013; James, 2003; Khelil, Hussainey and Noubbigh, 2016). Keil et al. (2010) also claimed that internal auditors' silence is caused by fear of job loss, demotion, and pressure. They considered pressures imposed by managers as the most prominent factor in this regard. Although several studies have documented that internal auditors are silent because of the reasons above, some empirical studies have addressed the issue that internal auditors' moral courage is a behavioral factor affecting the auditors' professional voice, which makes them not silent against fraud and misstatement in the financial statements of organizations (Khelil et al., 2018b). Moral courage is a behavioral trait motivating and enabling the auditor to take the right path by his/her professional ethics to observe professional principles in disclosing financial statements and confirm their compliance with auditing standards (Sekerka, Bagozzi & Charnigo, 2009). Morales-Sánchez and Cabello-Medina (2013) support the idea and believe that moral courage is a prerequisite for the behaviors of professional voice, including telling the truth. Such courage is an ethical qualification and is necessary for the success of the internal auditors' career path since it meets the auditors' inner and spiritual motivations. They would feel more satisfied because their performance aligns with their professional philosophy. In other words, internal auditors should be aware of the right tasks and must be courageous to disclose the facts in line with their professional philosophy (Khelil et al., 2016).

The significance of the present study can be examined from two perspectives. From a research perspective, the scientific importance of the study is that many studies have shown that, due to the interference of auditing operations in the management environment of organizations, internal auditing is likely to be influenced by managers' decisions. This mainly decreases the auditors' behavioral voice in line with their professionalism (Cassematis & Wortley, 2013; James, 2003; Khelil et al., 2016). In other words, practical pressures imposed by managers to cover the violations in a managerial performance pose a lot of psychological stress on internal auditors, making them be diverted from their career path and deviate from their primary tasks. According to Keil et al. (2010), the main reason for internal auditors' silence is factors such as the fear of job loss, demotion, and job pressure imposed on internal auditors due to managerial and structural features, making them silent in their professional career path. Accordingly, given the dearth of relevant research in Iran and regarding the role of these factors in promoting financial transparency, more scientific knowledge of factors reducing the internal auditors' silence would make information disclosure more in line with the auditors' statements (Nikbakht & Ghods Hasan Abad, 2018).

From an applied point of view and regarding the existing standards, according to the Executive Guidelines for the Quality Appraisal of Internal Auditing (2015) and the other relevant guidelines, although internal auditors are exposed to conflicting legal and cultural environments in their work and work in organizations with different objectives, sizes, complexities, and structures, they must maintain their behavioral and functional independence professionally and carry out their tasks regardless of all pressures. In other words, despite such differences and pressures, internal auditors should observe international standards of professional procedures (standards) of internal auditing in their operations (Okhravi Joghan et al., 2018). Despite the guidelines and standards for the professional operations of internal auditors, which help internal auditors disclose facts in the organization, Safarzadeh and Karimdad (2020) believed that internal auditors might face moral conflicts in revealing facts to save their position, which conservative behaviors may follow. In this regard, they should spare efforts to promote behavioral and functional courage to overcome fear and threats. Moreover, in Iran, according to Article 2 of the Guidelines for Internal Controls, the effectiveness of internal auditing as a financial objective is defined based on three criteria, namely reliability, relevance, and timeliness, to improve the quality of financial reporting and given that the provisions of this article in 10 guidelines have made auditors in charge of evaluating and monitoring internal controls, examining the independence level of internal auditors in terms of professional voice would be one of the corporate governance keys to promoting the quality of financial reporting.

Considering few studies addressing this topic and given the legal and institutional emphasis on the quality of internal auditing, the present study would provide the grounds better to understand internal auditors' behavioral and functional performance and increase information transparency in the form of financial reporting. Accordingly, this study aimed to examine the effect of internal auditors' behavioral voice on their moral courage.

2. Literature Review

2.1. Organizational voice

Some researchers have defined voice as an opportunity to express views to decision-makers in organizations. In contrast, other researchers have considered it a response to job dissatisfaction (Liu et al., 2009). For example, Van Dyne and LePine (1998) considered voice a cross-functional

behavior, which is voluntary, conscious, and beyond one's job expectations. These researchers say voice is "a promotional behavior not mere condemnation, which focuses on constructive views to improve the existing conditions." Similarly, Goldberg, Clark & Henley (2011) defined organizational voice as follows: "Voice refers to employees' decision to protest against the existing condition instead of remaining silent, surrendering, or quitting the organization." Some researchers have also set more objectives for employees' voices. Travis et al. (2011) claim that the employees' voices encompass discussing problems with supervisors, offering solutions and suggestions to human resources units, expressing ideas to change the work policy, and consulting with organizational unions or experts (Travis et al., 2011). According to Armstrong (2006), employees pursue four specific goals when expressing their voice:

- Expressing their dissatisfaction with the management or organization;
- Presenting collective solidarity with colleagues to managers;
- Involving in managers' decisions
- Maintaining mutual relations between employer and employees.

To reach organizational goals in today's competitive environment, the relationship between managers and employees should be such that the employees express their opinions and constructive ideas freely to improve the organization's output (Hames, 2012). Individuals who fail to express their ideas, opinions, and information often experience stress, anxiety, dissatisfaction, and depression, resulting in decreased work interests and job commitment. Accordingly, appropriate platforms and infrastructure must be provided to take some benefits from employees' comments and ideas (Naqavi Moqadam & Fahima, 2013). In this regard, Edmondson (2002) noted that one of the main features of successful learning in different work teams is all organizational members' willingness to present thoughts and ideas in the work process. This is called organizational voice (Detert & Burris, 2007). Travis et al. (2011) define organizational voice as discussing problems with supervisors, offering solutions and suggestions to human resources units, expressing ideas to change the work policy, and consulting with organizational unions or professionals (Engemann & Scott, 2020).

2.2. The role of internal auditors in promoting a professional voice

The prevalence of financial scandals has aroused public discouragement and made internal auditing standard developers investigate new methods to promote internal auditors' determination to be resilient against deviations and breaches and encourage trust by restoring accountability for revealing fraud internally and externally (Everett & Tremblay, 2014). In Standard 2060, the 27 Institute of Internal Auditors (IIA) (2015) mentioned that the chief audit executive should periodically report the objectives of the internal auditing operations, responsibilities, and the efficiency of programs to senior managers and the board of directors. The reports should also encompass significant risks and control issues such as distortion, governance, and other required or needed by senior management and the board of directors. Furthermore, the Association's Practice Advisory on the transmission of sensitive information internally and externally, in the Internal Auditing Standard (2440), notes that internal auditors sometimes face the problem of disclosing information to someone outside the authority domain or even outside the organization. This type of information disclosure is called "whistleblowing", which refers to disclosing information to an individual within the organization but outside the internal auditor's authority domain. In contrast, the misinformation disclosure to other competent authorities outside the organization is called "external whistleblowing ". Researchers approve these standards, and internal auditors are regarded as potential informants to report illegal intra-organizational activities to the audit committee, the board of directors, or other monitoring units. Furthermore, assuming the trust in internal auditors to

provide accurate information for internal monitoring, risk management systems, corporate governance procedures, the Institute of Internal Auditing's (IIA, 2015) standards, and behavioral principles, a set of behavioral norms are defined, which reflect principles to be followed by internal auditors. It should be noted that the internal auditors' coherence promotes trust and confidence in the auditors' judgment. Behavioral principles imply that internal auditors must act with honesty, accountability, and diligence, away from pressure or impact, to maintain organizational silence. Similarly, the disclosures are expected to align with the profession and the law. Several studies have documented that the disclosure of fraud, as ethical and extra-social behavior, is associated with many positive consequences for organizations and society at the macro level; however, because of their corporate structures monitored by their managers, the internal auditors are always imposed by a lot of pressure to be in line with the organizational goals. This would increase the likelihood of organizational silence. Some researchers have adopted attributes derived from moral and religious terms when describing the person who discloses such actions. According to Burke (2013), Grant considers whistle-blowers as conscientious internal auditors who adopt measures to increase decision-making capabilities to reduce information asymmetry.

2.3. Voice synergy in promoting moral courage

Despite their moral and professional commitments to reporting fraud, internal auditors tackle ethical inconsistencies when disclosing audit results, which would negatively affect their operations (Khelil et al., 2016). The independent auditor / corporate management faces two sources of power: The cash temptations raised by the management team to seduce auditors to circumvent the rules and, in contrast, independent auditors' resistance to such temptations. Osswald et al. (2012) claim that exhibiting moral behaviors when a power imbalance requires moral courage. Such courage refers to expressing personal views and values when exposed to disagreement and rejection (Lopez et al., 2003). Moral courage also refers to a person standing against a more powerful person (such as the boss) for greater benefit. In other words, when moral tastes are explicitly stated in a given situation, and the individual with moral courage stands against pressures posed to obey high-ranked authorities, he/she has a professional voice. In other words, moral courage acts as a shield against obeying authorities (Skitka, 2012). Academics and practitioners theoretically and empirically have documented the significance of moral courage for auditors. In a qualitative study, Libby and Thorne (2007) concluded that moral courage is an instrumental virtue that promotes internal auditors' internal judgment and a coherent factor in the vocal features of auditors' professional behaviors against organizational silence. Similarly, Armstrong et al. (2003) and Khelil et al. (2016) investigated the role of moral courage in promoting internal auditors' morality. They employed a coherent ethical decision-making model and revealed how moral courage could determine the auditors' potential to make ethical judgments. Roussy (2012) also found similar results. In his study, 14 audit committee members working in Quebec state agencies believed that courage is a critical value for internal auditors to discuss significant and sensitive issues to deal with organizational silence. The audit committee members are expected to be courageous in describing issues so that others would trust the audit reports. These findings are also consistent with Everett and Tremblay (2014). They detected the moral virtues making Cynthia Cooper employees behave ethically and report the fraud to bosses. Cynthia Cooper's charter made researchers conclude that ethical behavior underpins courage and resilience against silent threats.

2.4. Research Background

Khelil and Khlif (2022) conducted a study entitled "Internal auditors' perceptions of their role as assurance providers: a qualitative study in the Tunisian public sector". Qualitative research is conducted based on organizational role theory and semi-structured interviews with 13 chief audit executives across 13 Tunisian public-sector organizations. A thematic analysis of the responses of interviews is then performed. The content analysis of internal auditors' responses shows that ambiguity surrounds the role of Tunisian internal auditors within the public sector because they must serve multiple customers (e.g. informal groups in Tunisian society, managers and audit committees) with conflicting expectations. AL Fayi (2022) conducted a study entitled "Internal audit quality and resistance to pressure". This study uses data from the Global Internal Audit Common Body of Knowledge to investigate the relationship between internal audit functions' (IAF) quality and auditor resistance to pressure related to changes in internal audit reports. IAF quality is calculated using a composite measure comprising four IAF quality components. Auditors' resistance is measured using the extent to which internal auditors experienced a situation wherein they were directed to modify a valid audit finding in a report. The analyses prove that chief audit executives (CAEs) experience, certification, training and objectivity were all significantly associated with pressure resistance. In other words, a greater quality of IAF leads to a greater ability to resist pressure to change their reports. Alqudah et al. (2019) conducted a study entitled "Factors affecting the internal auditors' effectiveness in the Jordanian public sector: The moderating effect of task complexity". The research sample consisted of 155 internal auditors working in public sectors in Jordan, and partial least squares analysis was used to fit the model. The results revealed that five factors (namely structure, society, culture, management, and an individual) are the most important and influential in improving the effectiveness of internal auditing, management approaches to understand the profession of internal auditors and support them to exhibit independent behaviors in the framework of auditing standards. Farkas et al. (2019) used a 2*2*2 matrix and two control and experimental groups. According to the findings, gender differences in internal auditing make interaction with management different. Female internal auditors revealed more concerns and sensitivity to disclosing information; however, men may engage in behind-the-scenes relations with management. It was also noticed that effective management perceptions of internal auditing increase the frequency of information disclosure. Khelil et al. (2018a) conducted a study entitled "Breaking the silence: An empirical analysis of the drivers of internal auditors' moral courage". The sample consisted of 146 internal auditors in Tunisia. It was noticed that self-efficacy, flexibility, perceived support from the supervisor, and behavioral independence positively impacted internal auditors' courage. Khelil et al. (2016) used a qualitative method based on theoretically grounded theory analysis, in which there were interviews with 30 internal audit managers to develop a clear concept of the structural framework of the capital market companies in Tunisia. Revealing moral courage as a missing chain in the internal auditor's ethical guidelines, they considered moral courage a tool to maintain professional integrity and overcome fear to observe the internal auditor's behavioral independence.

In a study entitled "Auditors' reputation in managers' decisions by Tang et al. (2020), the auditor's reputation encompassed the features of the auditor's professional behaviors such as moral courage and professional independence, which was examined using a 2*2 matrix and pre-test and post-test scores. According to the findings, the internal auditors' reputation and credibility concerning behavioral and professional commitments improve managers' decisions. Mousavi Kashi and Mohseni Kabir (2019) conducted a study entitled "The effect of organizational silence on auditors' professional and ethical performance." In this study, 363 auditors employed in auditing firms, who were also members of the Iranian Association of Certified Public Accountants and the Audit Organization, were selected as the final sample. The results show that organizational silence

was more prevalent in the Association of Certified Public Accountants than in the Audit Organization. Furthermore, it was revealed that defensive silence had a significant impact on reducing the auditors' professional and ethical performance in both the private and state sectors and that altruistic silence had a significant impact on increasing auditors' professional and ethical performance. However, the effect of obedient silence on auditors' professional and ethical performance was not significant. There was a positive and significant relationship between auditors' individual-organizational features and their professional and ethical performance, and they had a greater impact on professional performance. Among the individual-organizational features, work experience had the most positive and significant effect on auditors' ethical and professional performance. Beyrami et al. (2019) conducted a study entitled "The effectiveness of internal control guidelines of the stock exchange organization in cement stocks companies" mainly to detect the possible obstacles and limitations on the application and implementation of internal control instructions in the form of a model in cement stocks companies. The researchers were also to offer the necessary solutions and suggestions to remove obstacles to establish and promote effective internal controls. The study sample encompassed 29 companies listed on the Tehran Stock Exchange. To address the hypotheses, the effect of internal control on three independent variables of risk management, financial reporting quality, and shareholders' rights in corporate governance was tested. The results revealed that internal control had a positive and significant effect on the three variables; hence, internal control seemed to affect financial reporting and risk management, which is of particular importance and could also positively affect shareholders' rights regarding corporate governance and promote shareholders' satisfaction.

2.5. Hypotheses Development

There is a consensus in current research that moral courage is not an inherent behavior; instead, it is related to motivation and the desire to grow through internal and external sources. The following discusses how positive states (self-efficacy, hope, and resilience), the independence of internal audit functions, and perceived supervisor support affect the internal auditor's moral courage.

2.5.1. the Positive States

Fredrickson et al. (2003) showed that positive states prepare the individual to cope with the constraints of the work environment and enable an internal auditor to demonstrate better performance capabilities. Similarly, Hannah and Avolio (2010) found that positive states such as self-efficacy, hope, and resilience, if combined with a social role, play a vital role in encouraging bravery when faced with role risks.

2.5.2. Self-Efficacy

Self-efficacy, introduced by Bandura (1986), is a fundamental concept in social cognitive theory. This term is an essential determinant of the amount of pressure and the degree of resistance of people in the face of important challenges. In this regard, understanding self-efficacy can accelerate motivation and performance in various ways. Mostly in relation with self – confidence, self-efficacy is operationalized in terms of challenging and selective goals, diligent effort, selection of difficult tasks, the movement towards mastery of work, goal achievement and persistence in faced with obstacles. The role of self-efficacy in increasing moral courage and overcoming fear. Based on this fact, high self-efficacy strengthens the belief that a person influences the situation to achieve the desired results, especially under risk conditions. Amos and Klimoski (2014) noted that self-confidence is an essential individual trait for courageous behavior. One who does not feel positive

about oneself cannot be expected to act courageously in risky situations. According to Hannah and Avolio (2010), self-efficacy is associated with dreaming of successful outcomes and encouraging goal-based behaviors. As a result, people with high levels of self-efficacy experience less stress and less threat when faced with a frightening situation. They try to resist despite the threats. Goud (2005) supports this belief and adds that belief and trust in one's abilities are the primary force in the face of fear, risk, and insecurity. Sekerka and Bagozzi (2007) appointed that belief in individual competence allows one to have some control over the existing situation. Chemers et al. (2000) confirm that this type of judgment reinforces the tendency for behaviors based on moral courage. They believe that self-efficacy is very important in moral courage because these kinds of judgments affect the type of individual skills and how these skills are used. Based on the above issues and based on social cognitive theory, the first hypothesis is expressed as follows:

H1: There is a positive relationship between self–efficacy and moral courage of internal auditor

2.5.3. Hope

According to Snyder et al. (1996), hope is a positive motivational state that consists of two components: 1) agent (energy based on goal) and 2) path (plan to achieve goals). First, people who pace on the path to their goals use their agent (motivation and will). Second, the paths show the way to achieve the goals. Based on the fact that hope is a combination of will (agent) and path strength (alternative solutions), research on moral courage believes that hope builds courage with the energy needed to achieve goals and enhances the visualization of different paths to success. Expectancy theory holds that individuals often decide and behave based on the likelihood of desired outcomes. Sekerka and Bagozzi (2007) acknowledge that the higher the expectation of moral courage behavior, the greater a person's desire for courageous behavior. Also, Hannah and Avolio (2010) believe that high levels of hope increase the visualization of a variety of alternative paths to deal with threats, as well as the use of focused energy to implement solutions, which reduces fear, stimulates behaviors and motivates courage behaviors. Similarly, Pury et al. (2007) showed that courage in any form (personal or general), when there is judgment and improvement in the situation, and the result is successful for the person, courageous behaviors are expected from the person. Based on the above issues and based on social cognitive theory, the second hypothesis is expressed as follows:

H2: There is a positive relationship between hope and moral courage of internal auditor

2.5.4. Resilience

Psychological research defines resilience as positive tolerance and acceptance in the face of significant risk (Luthans,2002; Luthans et al., 2007).

According to the American Psychological Association, Resilience is accepting appropriate exposure to harm, disaster, threat, or even significant sources of stress, such as family problems, illness, or financial or work-related stressors. Depending on the work environment, Luthans (2002) defines resilience as the capacity of positive psychology for returning to the original state resulting from uncertainty, conflict, failure, or even positive change, progress, and increased responsibility. Many studies have shown that people with high resilience are more likely to be effective in various life experiences, including adaption and growth under life-threatening situations. Hannah and Avolio (2010) state that resilience is similar to a tolerant utility. It is defined as the belief in one's ability to overcome negative cognition and rumination for achieving a given challenge. Courage requires an invitation to fight. In this regard, resilience is crucial for activating courage. Bergheim et

al. (2015) believe that resilience gives employees greater power to adapt and challenge individual assumptions, external barriers, and environmental challenges such as the work environment. Everett and Tremblay (2014) identified practical and vital virtues and considered them as criteria for moral behavior. The researcher stated that to disclose the facts, an internal auditor must have the power of positive adaptation in the face of any threat and risk. He said a person faces many difficulties in having moral courage, but this courage will come along with enduring hardships. The findings of Everett and Tremblay (2014) are consistent with the results of Khelil et al. (2016). They used 30 structured interviews with senior financial managers in Tunisia to identify factors that improve the ethical courage of internal auditors. There was a consensus among respondents that resilience is essential in activating courage. Therefore, in order to behave courageously, internal auditors must be able to withstand risk, threat, and danger. Based on the above explanations, the third hypothesis is expressed as follows:

H3: There is a positive relationship between resilience and moral courage

2.5.5. Perceived Supervisor Support

Perceived Organizational Support (POS) is employees' belief about the importance of the organization to their efforts and the organization's attention to their health. Organizational support theory assumes that the development of perceived organizational support is an individual need based on meeting the spiritual motivations of employees that are always required of the organization. Perceived organizational support is a guarantee provided by the organization when faced with stressful situations, and in return, employees can effectively perform their assigned tasks. In addition, perceived organizational support strengthens employee identity, supports organizational goals, and enables the organization to go beyond its routine tasks. According to Hannah and Avolio (2010), Perceived organizational support can help reinforce the courageous behavior of individuals and encourage any deviation from the right path to be reported so that this value is institutionalized in the organization and thus, value-oriented behaviors are encouraged. Supervisors in organizational structures can also reinforce such supportive behaviors because they are the link between employees and the organization. Rhoades and Eisenberger (2002) acknowledge that good behavior by the supervisor contributes to perceived organizational support. The strength of this relationship is related to the extent to which employees identify supervisors within the organization. Mayer et al. (2013) believe that employees expect supervisors to support them when faced with uncertainty. Alleyne et al. (2013) point out that the concept of perceived organizational support is consistent with social exchange theory. The relationship between supervisors and subordinates is based on social exchange, and each party must provide something considered valuable to the other party. The other party must consider this transaction and exchange equally and fairly. In this case, Alleyne et al. (2013) explain that it is very likely that auditors will show more commitment when they believe in a high level of organizational support. Therefore, the auditor feels more comfortable and secure in reporting unethical behaviors. In other words, the audacity to speak depends on the auditor's belief in organizational support. Several studies describe the audit committee as an organizational factor supporting internal auditors in the internal auditing environment. Internal audit tasks, such as control of effectiveness and acting impartially and powerfully, are strongly supported by the audit committee. Considering the audit committee as an essential driving force in increasing the organizational position of internal audit, the audit committee should strengthen the professional position of the internal auditor by providing a supportive environment (Alzeban, 2015; Zaman & Sarens, 2013). The Organization for Economic Co-operation and Development (OECD) supports

this belief. It states that the audit committee should be able to provide more support for the effectiveness and independence of internal audit activities.

Assuming that audit committees are considered organizational agents and are responsible for guiding and evaluating the performance of internal auditors, the present study believes that internal auditors consider the audit committee's favorable and unfavorable orientations towards them as a sign of organizational support. Based on organizational support theory and social exchange theory, the present study hypothesizes that internal auditors decide to report fraud and distortion or remain silent based on their belief in organisational support. According to the above explanations, the fourth hypothesis can be presented as follows:

H4: There is a positive relationship between the audit committee's perceived support and moral courage

2.5.6. Independence of internal audit tasks

Independence is the freedom from conditions that do not threaten the internal audit activity to perform its assigned tasks directionally. Auditor independence is an essential factor for the auditing profession. The evidence suggests that auditing and financial reporting quality depends on the auditor's independence. In this regard, the Internal Auditors Association has published several operational standards and recommendations for the Institute of Internal Auditors (IIA) (2015). According to Standard 1100, internal audit activity must be performed independently, and internal auditors must act impartially in the performance of their duties. In other words, independence is a tool that protects the internal auditor against conflicts of interest, orientation, or the influence of others that harm their professional judgment (Abbott et al., 2016). Assuming that internal auditors are under management pressure in the company environment, the above standard emphasizes that the chief audit executive must have a clear definition of the position and description of internal audit duties so as not to interfere with the independence of internal audit duties. Internal auditing standards emphasize that the auditors' impartiality is maintained when the audit committee's oversight increases. Therefore, the internal auditor's independence is a direct function of the reporting relationship between the audit committee and the internal auditor's job duties. In this regard, a large part of the research supports that more oversight of the audit committee leads to greater independence of internal audit tasks and acts as a shield for auditors against possible management pressures (Goodwin & Yeo, 2001; Abbott et al., 2015). James (2003) stated that internal auditors in interaction with the audit committee are more likely to report fraud than auditors associated with senior management. In this regard, Goodwin & Yeo (2001) found that the dynamics of the relationship between the internal auditor and the audit committee could strengthen the job position of the internal auditor and their independence. Stewart and Subramaniam (2010) stated that the audit committee could create an environment where internal auditors can more confidently report any misstatement of financial performance. In addition, Alzeban (2015) argues that the audit committee should not hire or fire internal auditors under the influence of management because in this case, the independence of internal auditors will be influenced by management decisions. The audit committee should play a supportive role in increasing the level of independence and impartiality of the internal audit without applying the management's opinion so that the internal auditors can perform their professional duties per the approved standards.

H5: There is a positive relationship between the independence of internal audit tasks and moral courage.

In Figure (1), the proposed theoretical model examines the effects of self-efficacy, hope, resilience, the audit committee's perceived support, and internal auditors' independence on the internal auditor's moral courage.
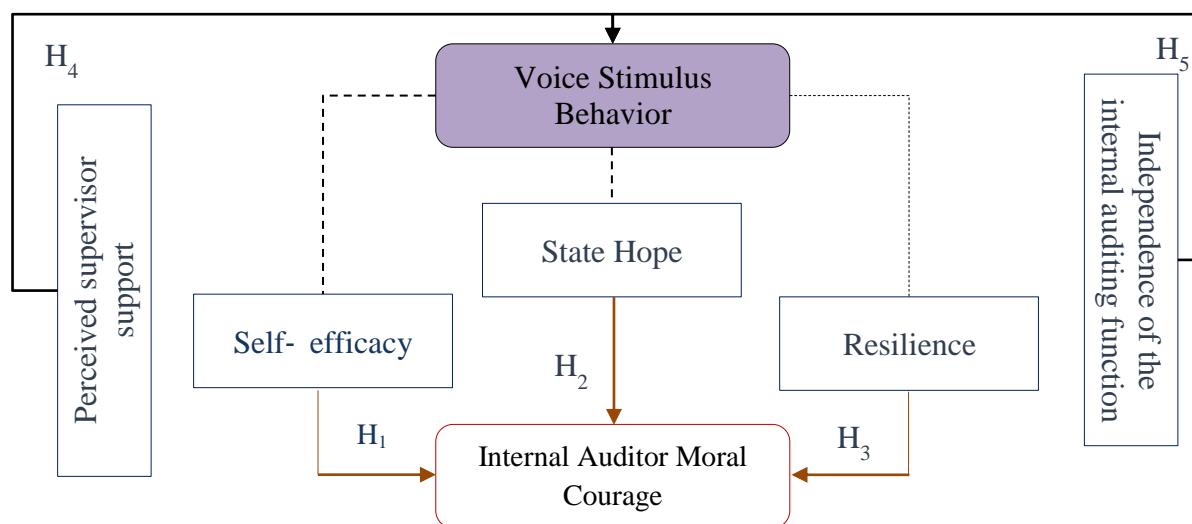

Figure 1. The Conceptual model of the study

3. Research Methodology

The present study was applied in terms of the type and nature of the study and research objectives. This research was a correlational survey regarding the descriptive data collection method. In other words, the required data were collected using a survey. To this end, the questionnaire was used for data collection since, following previous studies, it is an effective method to gather data from a large sample (Hair et al., 2011). Moreover, the library method and the analysis of the theoretical foundations in similar studies were used to collect data on the theoretical foundations of the research. The questionnaires were distributed among the target population during the spring and summer of 2018. For this purpose, the researchers used standard questionnaires developed by Hannah and Avolio (2010), Parker (1998), Snyder et al. (1996), Block and Kremen (1996) and Cohen et al. (1998) in this study. The items in both questionnaires were scored using a five-point Likert scale ranging from strongly agree to disagree strongly, with higher scores indicating the higher rate of each variable. The questionnaires used in this study are valid and reliable, as documented in previous studies. The researcher promised the participants to observe ethical issues and ensure the confidentiality of their personal information. When distributing the questionnaires, the researcher explained the nature of the study to the participants. They were asked to freely select the options since there was no necessarily right or wrong option. It must be mentioned that all data were collected from one source over a specified period (each participant filled all predictive and standard questionnaires simultaneously). The research variables were measured as follows:

Moral courage

Sekerka and Bagozzi's (2007) four-item questionnaire was used to measure moral courage. To this end, the participants were asked to assess their moral courage based on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 1 (strongly agree). To conceptualize this questionnaire, the participants were asked about their reactions if they found out their manager was cheating. The questionnaire's content was revised and modified by researchers and experts in several phases to confirm its content validity. The Cronbach's alpha coefficient for this questionnaire was reported by Sekerka and Bagozzi (2007) to be about 0.78. To adjust the content of the items, Cronbach's alpha coefficient was calculated once more (r= 0.81).

Self-efficacy

We use Parker's (1998) standard 10-item questionnaire to measure self-efficacy in this study. This questionnaire asks the respondents to evaluate their self-efficacy when performing each of the ten tasks based on a five-point Likert scale (1= No self-efficacy, 5=high self-efficacy). Experts confirmed the validity of the questionnaire, and its reliability was approved by Khelil et al. (2018a) (r=0.72). In this study, Cronbach's alpha coefficient was evaluated and estimated to be 0.77.

Hope

we use Snyder et al. (1996) questionnaire to measure the hope among the participants. This questionnaire consists of six items developed based on psychological analysis. Regarding its content validity, this questionnaire was re-examined to provide a simple theoretical understanding for the participants. The validity of this scale was confirmed, and Cronbach's alpha coefficient for this questionnaire was 0.87. Accordingly, the reliability of the questionnaire was also confirmed.

Resilience

Block and Kremen's (1996) questionnaire is used to measure resilience. It is a 14-item questionnaire whose validity was confirmed by experts, and its reliability was reported in some studies to be 0.83 (Caprara et al.,2003). Cronbach's alpha coefficient in the present study was 0.79.

Perceived support from the audit committee

Considering the findings reported by Rhoades and Eisenberger (2002) noted that auditors who emphasize and support professional ethics, compared to other auditors who neither support nor adhere to it, are mainly focused on the effectiveness of the auditing and less seek the efficiency of auditing. This questionnaire includes three questions to detect differences in the auditors' attitudes towards the perceived support from the audit committee. The questions are to detect the extent to which the audit committee supports the internal auditors' performance against managers even when it causes dissatisfaction and failure to meet their expectations. The questionnaire's content was revised and modified by researchers and experts in several phases to confirm its content validity. The Cronbach's alpha coefficient for this questionnaire was reported by Cohen et al. (1998) to be about 0.78. To adjust the content of the items, Cronbach's alpha coefficient was calculated once more (r= 0.81).

Independence of internal audit tasks

Abbott et al. (2016) standard questionnaire was used to assess the independence of internal audit tasks, which addressed three criteria: Right to terminate a contract, number of reporting lines, and

budget control. These three criteria, in the form of nine items, were measured based on a 5-point Likert scale. To calculate the relative degree of supervision, internal auditors were asked to indicate how much they agreed with the influence of the audit committee versus the impact of the CEO, and Chief Financial Center, on these three factors. The reliability of this questionnaire was estimated by Cronbach's alpha coefficient (r=0.86).

3.1. Sampling

The initial sample of this study consists of internal auditors of firms listed on the Tehran Stock Exchange (TSE). Since there are no accurate statistics of internal auditors, Cochran's formula was used to determine the number of samples, assuming an unknown statistical population:

$$n = \frac{Z_{\alpha/2}^2 . \sigma^2}{e^2} = \frac{1/96^2 * 0/683^2}{0/1^2} = 179$$

Where *n* indicates the sample size; $Z_{\alpha/2}$ is the standard normal value (1.96), σ^2 is the variance of the population (since it is unknown, it was obtained by using a pre-test and examining the standard deviation for 30 persons), *e* is the accuracy considered in this study, which is usually considered to be 0. Using the formula above, the number of samples is 179 persons. To increase the study's validity, 250 questionnaires were randomly distributed among the auditors, and finally, 183 questionnaires were collected and used in the statistical analysis. The final analysis of the collected data is performed using structural equation modeling in PLS software. The structural equation modeling is as follows: The model fit (including measurement model fit, structural model fit, and general model fit) was revised, and the research hypotheses were tested.

4. Findings

In this study, structural equation modeling was run in PLS software to test the research hypotheses. The reliability and validity of the research variables were examined using the partial least squares method, and the hypotheses were then tested using the model fit. Table (1) presents the descriptive statistics of the research variables.

Table 1. The Descriptive statistics of research variables

Variables	Mean	Sd	Min	Max
Moral courage	3.63	1.51	1.05	5
Self-efficacy	3.64	1.53	1.000	5
Hope	3.36	1.39	1.110	5
Resilience	3.88	1.29	1.000	5
Perceived support from the audit committee	2.48	1.49	1.000	5
Independence of internal audit tasks	2.74	1.66	1.000	5

Table (1) shows that regarding the questionnaire's 5-point Likert scale, the largest mean value was observed for resilience (Mean=3.88). According to the findings, the internal auditors considered stress management, anxiety, and stress control as critical factors for internal auditors on their professional path. Regarding internal auditor's accountability, the second largest mean score is reported for moral courage (Mean=3.63). This finding indicates that internal auditors regard moral courage as an important criterion for internal auditing due to the defined nature of the profession under the supervision of the CEO. This makes internal auditing closer to the nature of the defined independence-like nature of auditing standards. On the other hand, the largest standard deviation value is observed for the independence of the internal audit tasks, suggesting that the participants selected different views on the Likert scale in this regard.

4.1. Inferential statistics

In this study, Cronbach's alpha coefficient was used as an internal consistency method to assess the reliability of the questionnaires. In general, Cronbach's alpha coefficient ranges from zero (i.e., no positive correlation) to one (i.e., highly strong correlation). Table (2) presents that Cronbach's alpha coefficients >0.7 for each questionnaire imply the acceptable reliability of the three questionnaires used in this study.

Table 2. The questionnaire details

Latent variables	Cronbach's Alpha>0.7
Independence of internal audit tasks	0.95
Perceived support from the audit committee	0.89
Self-efficacy	0.93
Hope	0.92
Moral courage	0.90
Resilience	0.97

4.2. Testing the conceptual model and research hypotheses

Structural equation modeling with partial least squares and the Smart-PLS approach was adopted to analyze the research data. Software using structural equation modeling regarding this statistical method is compatible with conditions such as the collinearity of independent variables, data normality, and small sample size (Hulland, 1999). The software output for testing the conceptual research model is presented in Figures (2) and (3). The results of testing the measurement and structural models are described below in detail.

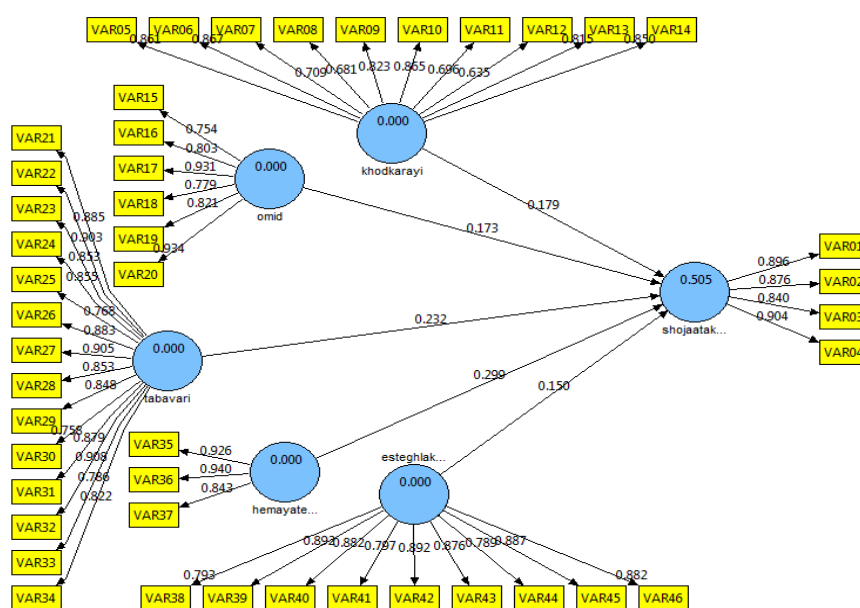**Figure 2.** The Conceptual research model in standard mode
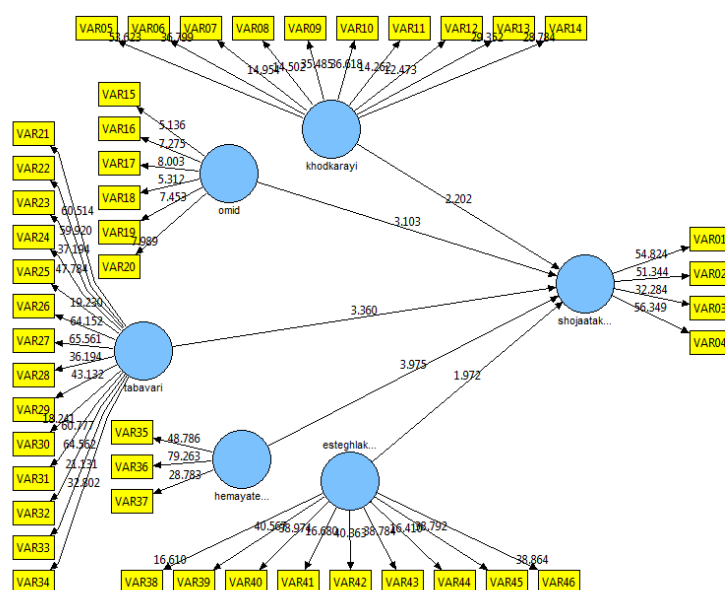

Figure 3. The Conceptual research model with significant coefficients (T-values)

Structural equation models are generally a combination of measurement models (indicating sub-components of latent variables) and structural models (indicating relationships between independent and dependent variables).

4.3. Measurement model test

Reliability, convergent validity, and divergent validity were adopted to evaluate the fit of the measurement model. To evaluate the validity of the structures, Fornell and Larcker (1981) introduced three criteria, namely the validity of each item, composite reliability (CR) of each structure, and the average variance extracted (AVE). The factor load coefficients >0.4, AVE >0.5, and CR> 0.7 suggest that the measurement models are well-fitted and convergent in terms of reliability and validity (Hulland, 1999). The results of these indices are shown in Table 2.

After running the confirmatory factor analysis (CFA), as shown in Table (2), it is noticed that all the items have a factor load >0.4, AVE> 0.7 and CR> 0.5. In other words, the values indicate this criterion's appropriateness and the measurement models' appropriate reliability.

Table 3. The Descriptive statistics and CFA results

Latent variables	Observed variables	mean	sd	Factor load	AVE	C. R
Moral courage	1	4.14	0.87	0.9	0.77	0.93
	2			0.88		
	3			0.84		
	4			0.90		
Self-efficacy	5	4.33	0.69	0.86	0.62	0.94
	6			0.87		
	7			0.71		
	8			0.68		
	9			0.82		
	10			0.86		
	11			0.70		
	12			0.64		
	13			0.81		
	14			0.85		
Hope	15	3.82	0.86	0.75	0.71	0.93
	16			0.80		
	17			0.93		
	18			0.78		
	19			0.82		
	20			0.93		
Resilience	21	4.07	0.91	0.89	0.73	0.97
	22			0.90		
	23			0.85		
	24			0.85		
	25			077		
	26			0.88		
	27			0.91		

	28			0.85		
	29			0.85		
	30			0.76		
	31			0.88		
	32			0.91		
	33			0.79		
	34			0.82		
Perceived support from the audit committee	35			0.93		
	36	4.35	0.70	0.94	0.82	0.93
	37			0.84		
	38			0.79		
	39			0.89		
	40			0.88		
Independence of internal audit tasks	41			0.80		
	42	4.16	0.88	0.89	0.73	0.96
	43			0.88		
	44			0.79		
	45			0.89		
	46			0.88		

The acceptable divergence validity of a model implies that one construct in the model has more interaction with its indices compared to other constructs. According to Fornell and Larcker (1981), divergent validity is acceptable when the AVE value of each construct is larger than the joint variance of the concerned construct with other constructs in the model. This is evaluated using a matrix, the cells containing the values of the correlation coefficients between the constructs and the square root of the AVE for each construct. According to the value of the correlations and the square root of AVE, placed on the diameter of Table 4, the model's divergent validity at the construct level is confirmed by Fornell and Larcker's (1981) criterion.

Table 4. The Correlations between latent variables and AVE values

Research variables	Independence of internal	Perceived support	Self-efficacy	hope	Moral courage	Resilience
Independence of internal audit tasks	0.86					
Perceived support from the audit committee	0.55	0.90				
Self-efficacy	0.48	0.53	0.78			
Hope	-0.02	0.05	-0.02	0.84		
Moral courage	0.50	0.60	0.52	0.19	0.88	
Resilience	0.44	0.49	0.51	0.02	0.54	0.85

4.4. Structural model test
After evaluating the validity and reliability of the measurement model, the structural model was assessed based on the relationships between the latent variables. This study considered the coefficient of determination (R^2) and predictive power coefficient (Q^2).

4.5. Coefficient of determination (R^2) and predictive power coefficient (Q^2) was considered.

R^2 indicates the effect of an exogenous variable on an endogenous variable. As shown in Figure 2, the R^2 value is estimated for the endogenous constructs, confirming the structural model's appropriateness. Moreover, Q^2 was used to evaluate the predictive power of the model. According to the results in Table 4, it is observed that the model has "strong" predictive power.

Table 5. The Coefficient of determination (R^2) and predictive power coefficient (Q^2)

	R^2	Q^2
Moral courage	0.500	0.370

After fitting the measurement and structural models of the present study, the Goodness of Fit index (GOF) was used to control the model's fit. This index introduces three values of 0.01, 0.25 and 0.36 as weak, medium, and strong. GOF is calculated by Eq. (1):

$$GOF = \sqrt{\overline{Communalities} \times \overline{R^2}}$$

Where *communalities* are obtained from the mean of the joint values of the latent variables.

Table 6. The GOF results for research variables

Latent variables	Communality	R^2	$\overline{Communality}$	$\overline{R^2}$	GOF
Independence of internal audit tasks	0.73				
Perceived support from the audit committee	0.82		0.73	0.50	0.60
Self-efficacy	0.62				
Hope	0.71				
Moral courage	0.77	0.50			
Resilience	0.73				
Independence of internal audit tasks	0.73				

The GOF value of 0.60 indicates that the total fit of the model is confirmed to be "strong".

4.6. Testing research hypotheses

Table 7. Testing research hypotheses

Hypotheses	The causal relationship of research variables	coefficient β	T − Value	Test results
H_1	There is a positive relationship between self–efficacy and moral	0.18	2.20	Confirmed

	courage of internal auditor			
H₂	There is a positive relationship between hope and moral courage of internal auditor	0.17	3.10	Confirmed
H₃	There is a positive relationship between resilience and moral courage	0.23	3.36	Confirmed
H₄	There is a positive relationship between the audit committee's perceived support and moral courage	0.30	3.97	Confirmed
H₅	There is a positive relationship between the independence of internal audit tasks and moral courage.	0.15	1.97	Confirmed

The research hypotheses were tested after examining the fit of the measurement and structural models and confirming the appropriate fit of the concerned models. Table (7) shows the results of significant coefficients for each hypothesis, standardized coefficients of paths for each hypothesis, and the hypothesis test results at a 95% confidence level.

Figure 3 and Table 7 present the significant coefficients of the variables. Since the significant coefficients of the variables are larger than the absolute value of 1.96, the research hypotheses are confirmed.

5. Conclusion

An internal audit is an appropriate approach to examining the internal performance of organizations. The first step in establishing an internal audit unit is for the managers to confirm the necessity of establishing such a unit in the organization. In such units, internal auditors significantly affect any activity regarding non-compliance with established procedures, programs, rules, and regulations set by regulatory agencies, and they thus have a significant impact on organizational activities (Rahmaninia & Yaqoubnezhad, 2017). This research examines the effect of stimulating individuals' voices on internal auditors' professional moral courage. This study analysed the data extracted from 183 questionnaires from internal auditors of firms listed on the Tehran Stock Exchange (TSE). According to the findings, self-efficacy positively and significantly affects moral courage. In other words, an auditor with high self-efficacy spares efforts to pursue the goal of his/her professional career to the extent possible and not deviate from his/her professional path to possible pressures and limitations imposed by company managers in his/her workplace. Such an internal auditor having high self-confidence observes the defined features of his/her profession.

Such an efficient internal auditor needs moral courage since he/she may get overwhelmed by pressures and anxieties and fail to perform well enough to promote transparency. Self-efficacy in internal auditors requires self-confidence and belief in one's abilities; otherwise, he/she is overwhelmed with the demands and expectations of stakeholders such as managers or the board of directors and is far away from his/her professional philosophy. This means that an internal auditor needs to be self-efficient to achieve the moral courage to disclose the organization's financial performance; as such, he can best demonstrate his professional skills and the auditing standards. Regarding the testing results of the second research hypothesis, it was noticed that the internal auditor's hope could positively promote his/her moral courage to state the facts. According to Snyder et al. (1996), hope is a psychological state underpinned by incentives and energy to achieve a goal. This requires the internal auditor's mental presence and spiritual concentration in the profession, revealing the difference between a courageous internal auditor and an obedient internal auditor. A hopeful internal auditor has a creative vision and seeks to achieve professional success and increase the effectiveness of his/her career by selecting the best path to further success in this field. He/she also does not give up in the face of threats and strives hopefully to promote transparency. According to the third hypothesis test results, internal auditors' resilience also has a positive effect on their moral courage since tolerance and potential to control professional conditions and emotions provide an individual with higher courage to move in line with the professional auditing ethics, withstand environmental, occupational, and organizational difficulties, and create an acceptable balance between his/her profession and family. Accordingly, they would not suffer from job burnout or conflicts. Under such conditions, the auditor with higher resilience is more powerful against occupational difficulties and threats and, by increasing the quality of his/her performance, responds well to the community's expectations and shareholders and investors who want to reduce agency costs. Resilience makes individuals gain higher courage on their career path to increase their professional quality and satisfaction and assume each moment of presence in this profession as an attractive challenge for themselves. The test results of the fourth hypothesis revealed that the audit committee's perceived support as internal auditors' supervisors could contribute to promoting internal auditors' moral courage, even under the control of corporate management. The audit committee considering the nature defined in organizational frameworks supports internal auditors to perform their tasks well and helps them modify discrepancies by reporting them to independent auditors to increase information symmetry and provide shareholders and investors with more decision-making power. In other words, the perceived support from the audit committee is a guarantee provided by this supervisory unit for internal auditors facing stressful conditions; as such, the internal auditors would perform their tasks more effectively. Moreover, perceived support empowers the employees' identity to pursue the goals of the auditing profession, allowing them to go beyond their routine duties. Such supports institutionalize the behavioral values in the organization and make internal auditors more responsive and courageous against threats and deviations by the ethics of professional conduct for them to act more effectively. The test result of the fifth hypothesis suggested that the internal auditor's independence refers to the lack of structural and supervisory constraints on the auditors' performance to disclose the facts, thus making internal auditors act more realistically on their professional path. Accordingly, it was noticed that the internal auditor's independence makes him/her exhibit more courage in his behaviors and actions; hence, he/she not only consults with the organisation's managers but also reports any deviations from the financial statements. Some auditing standards, including Standard 1100, highlight the need to maintain the internal auditor's independence and consider it an effective factor in promoting transparency and fair and impartial actions by the auditors. The independence of a company's internal auditor makes the auditor more sensitive to conflicts of interest, bias, or the

influence of others and thus be more courageous in presenting his/her reports about the organization. Assuming that internal auditors are under management pressure in the organizational environment, the standard above refers to the fact that the chief audit executive must have a clear definition of the position and the internal auditors' tasks so as not to disrupt the independence of internal auditors. The results of the research hypotheses were consistent with the findings reported by Khelil et al. (2016), Alleyne et al. (2013), and Stewart and Subramaniam (2010).

According to the findings, self-efficacy as positive behavior in internal auditing is promoted by holding training courses under the support of audit committees to make internal auditors' practices in line with specific standards in this field to promote ethical and courageous behaviors free from management pressures. This, in turn, would enhance their self-efficiency. In addition to holding training programs, the promotion of internal auditors in the chart of organizational structures in organizations may provide behavioral and professional incentives for auditors and make them more resistant to possible pressures posed by stakeholders. Another recommendation is that, in addition to promoting human resource strategies for the growth and development of internal auditors' self-efficacy, internal auditors' hopefulness is considered on their professional career path, and their behavioral and professional capabilities in providing consulting services to corporate executives to achieve competitive advantage should also be increased. It is also recommended to help internal auditors by setting specific criteria on their professional behaviors in line with auditing standards not only to reduce their stress and career conflicts such as work-family and family-work conflict but to exhibit more coherent and integrated behaviors to enhance financial transparency. In this regard, the theories of expectation and equality should be considered to promote internal auditors' confidence; hence, they would not believe that their movement in line with management demands gives meaning to their functional value. This is because, given the behavioral nature of the profession, internal auditors are under more pressure to have specialized performance, and the absence of the theories of equality and expectation would affect their unbiased performance. This would help internal auditors present more resilience and tolerance against occupational difficulties and stress. It is also suggested to support internal auditors by upstream units such as the Audit Committee and the internal audit manager to provide professional value-oriented behaviors to enhance transparency in the company and reduce agency costs. Finally, according to inter-organizational regulations, efforts should be made to save internal auditors' independence in competition among organizations. A more obvious reporting relationship between audit committees and internal audit tasks should be established. In other words, more interactions between internal auditors and audit committees enhance the internal auditor's mental and behavioral security against any deviations and fraud in financial reporting and make organizations exhibit a more credible image of themselves in a competitive market. This would not only decrease the potential constraints on the provision of cash resources but also promote confidence and trust in the financial reporting by organizations, thereby enhancing the likelihood of organizations' success in future projects and maximizing shareholder wealth.

Limitations and further to the study
A limitation of this study is that the internal resources (self-efficacy, resilience, and hope) rely on self-report measures that can induce a bias because of the respondents' desire for social acceptance. Recognizing that both moral courage and internal auditing activity (Alzeban, 2015) involve normative elements and cultural differences, our study opens the door to further experimental investigations to examine the effect of positive states (self-efficacy, state hope, and resilience), perceived supervisor support, and the independence of internal audit function on internal auditors'

moral courage in cultures different from the Iranian one and thus permitting one to compare the findings emerging from different contexts.

The effects of state hope on internal auditors' moral courage in the Iranian context will be studied in future work (when a new law will be implemented to protect internal auditors or when the score of democracy improves). Finally, further research should be conducted to investigate the effect of other internal and external resources (e.g., inner convictions, positive traits, social identity, and group norms).

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