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Managers' narcissism, earning quality, and bankruptcy risk: A test of behavioral psychology theory

Narcisismo dos gerentes, qualidade dos ganhos e risco de falência: Um teste da teoria da psicologia comportamental

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Abstract
Purpose: This study was conducted with the aim of investigating the effect of narcissism in managers on profit quality and bankruptcy risk. **Design/methodology/approach:** The present study is applied in terms of purpose and is in positive accounting research. The research data were also collected based on information from sample companies selected by the systematic elimination sampling method. Based on this, 177 companies were selected over ten years, from 2012 to 2021. The research data were extracted annually from Rahavard Novin 3 software. After performing calculations in EXCEL software to enter the relations and hypotheses of the research, they were entered into Eviews software .**Findings:** The results of the research hypotheses test showed that managers' narcissism significantly affects earnings stability, earnings predictability, earnings relevance, earnings timeliness, and bankruptcy risk. We also found that narcissistic managers could have two positive and negative dimensions and the presence of these managers in the organization increases the quality of earnings but also the risk of bankruptcy.**Academic contributions:** There is a contribution to the development of knowledge related to the effect of managers' narcissism on the profitability and bankruptcy of organizations. **Practical contributions:** The presence of narcissistic managers in the organization can have two positive and negative dimensions, and narcissistic characteristics may neutralize their creative talent for the organization.
Keywords: Managers; narcissism; earning quality; bankruptcy risk.

Resumo
Objetivo: Este estudo foi realizado com o objetivo de investigar o efeito do narcisismo em gestores sobre a qualidade do lucro e o risco de falência. **Metodologia:** O presente estudo é aplicado em termos de propósito e está em pesquisa contábil positiva. Os dados da pesquisa também foram coletados com base nas informações das empresas da amostra selecionadas pelo método de amostragem por eliminação sistemática. Com base nisso, 177 empresas foram selecionadas ao longo de dez anos, de 2012 a 2021. Os dados da pesquisa foram extraídos anualmente do software Rahavard Novin 3. Após realizar cálculos no software EXCEL para inserir as relações e hipóteses da pesquisa, estas foram inseridas no software Eviews. **Principais resultados:** Os resultados do teste de hipóteses de pesquisa mostraram que o narcisismo dos gestores afeta significativamente a estabilidade dos lucros, a

previsibilidade dos lucros, a relevância dos lucros, a pontualidade dos lucros e o risco de falência. Constatamos também que os gestores narcisistas podem ter duas dimensões positivas e negativas e a presença desses gestores na organização aumenta a qualidade dos ganhos, mas também o risco de falência. **Contribuições acadêmicas:** Há uma contribuição para o desenvolvimento do conhecimento relacionado ao efeito do narcisismo dos gestores sobre a lucratividade e falência das organizações. **Contribuições práticas:** A presença de gestores narcisistas na organização pode ter duas dimensões positivas e negativas, e as características narcísicas podem neutralizar seu talento criativo para a organização.

Palavras-chave: Gestores; narcisismo; qualidade de ganhos; risco de falência.

1. Introduction

Behaviorist theory states that introspection should not be used too much, and it is better to examine people's behavior and appearance (Shapiro, 2014). Behaviorists believe that human beings' mental and inner propositions will manifest in behavior. This means one can understand traits such as arrogance, jealousy, pride, resentment, etc., through a person's behavior (Tett et al., 2021). One of the traits that can affect a person's behavior is narcissism. In psychology, narcissism represents excessive love and affection for oneself as well as reliance on one's inner interests and perceptions. The narcissistic and self-centered personality exploits others to achieve their desires (Ogrodniczuk, 2013). The special characteristics of a narcissistic person can significantly affect his way of thinking, expressing and behaving (Hart et al., 2021).

In today's world, management plays a decisive role in the success of companies. Among the four key success factors in organizations including labor, capital, raw materials and management, the role of management has become more important than ever before. Managers affect the company's financial and non-financial aspects with their decisions (Gan, 2019). Researchers have indicated the effect of the narcissistic tendencies of CEOs on corporate decision-making (Habib & Hasan, 2017). Previous research revealed a narcissistic manager at the head of an organization can affect various aspects of a company such as performance, earning ability, bankruptcy risk, rate and degree of tax evasion or avoidance, investment method, and many other factors (Cragun et al., 2020; Buyl et al., 2019; Olsen & Stekelberg., 2016; Wales et al., 2013). Ham et al. (2018) state that narcissism in managers is significantly associated with over-investment in various sectors, especially in research and development. They also state that companies with narcissistic managers will experience less financial productivity and perform worse than other companies. Despite poor performance, narcissistic managers often request higher rewards than their peers (Ham et al., 2018).

Various studies have also shown that narcissistic managers usually avoid unfavorable results because they seek to gain the social identity and respect of others and receive more rewards, so they may even hide unfavorable results (Buyl et al., 2019; Olsen et al., 2014). Such results reveal that narcissistic CEOs' self-admiration and sense of superiority are the drivers to avoiding potentially unfavorable outcomes. This issue can affect earning quality. Investors use the firm earning criterion for their financial decisions, and when the earnings quality is low, it may mislead investors (Kontesa et al., 2021). The issue of earning quality is critical and can affect the distribution of wealth between shareholders and investors, company risk, capital formation rate, cost of capital, and many other aspects of the company (Indarti et al., 2019; Beigi et al., 2016). In this regard, the type of attitude and personality of managers about procedures and financial reporting can affect how they prepare information. Managers with different goals may manipulate earnings or hide factual information from investors (Bouaziz et al., 2020). Narcissistic managers consider themselves superior to laws and regulations and usually do not pay attention to the wishes and needs of others. This attitude can increase the possibility of unethical activities, concealment, earning management, etc., and affect the earning quality (Lin et al., 2020). On the other hand, narcissistic managers may disclose financial reports faster than other managers to show their good performance. They may even engage in earnings management to show company performance stability. This action of theirs can increase the earning stability (Abdel-Meguid et al., 2021).

Another dimension examined in this study is the risk of corporate bankruptcy. Most of the time, there are different reasons for the company's bankruptcy risk. The main reason for companies' bankruptcy can be traced to their mismanagement (Faghekarimi et al., 2022). As stated earlier the manager's decisions affect all financial and non-financial aspects of the company. Therefore, when a narcissistic manager is in charge of the company, it can cause liquidity risk and, ultimately, bankruptcy risk for the company (Buyl et al., 2019; Perez, 2017). Narcissistic managers usually make sudden decisions without consultation, and this will cause sudden changes in the company and increase risk. These managers usually tend to invest in profitable projects with high risk and also adopt aggressive policies regarding the company's liquidity (Buelow & Brunell, 2018; Schoenherr, 2017; Zhu & Chen, 2015). Managers generally choose strategies to improve the organization's performance, but when they involve their personal feelings and moral norms in business decisions, their rationality will be doubted (Engelen et al., 2015). Narcissistic managers are generally overly optimistic about their performance and the company's future and rely on their abilities more than expected. These managers usually consider themselves more robust than the problems and underestimate the risks ahead (Buchholz et al., 2018). Narcissistic managers quickly react in the face of risky situations and make decisions without considering the consequences. Also, they are not careful in determining the company's strategies and take aggressive policies regarding capital structure, investment, cash management, and other decisions (Salehi et al., 2021; Fedorova et al., 2018). Some researchers have even shown that in organizations with narcissistic managers, employees have a lower sense of organizational justice and prosperity, and also, in these organizations, productivity is significantly lower (Ni et al., 2021; Ha et al., 2020; Ham et al., 2018). Therefore, it can be expected that the presence of narcissistic managers in an organization affects the firm's efficiency, liquidity, and bankruptcy risk. Therefore, an important question that arises, and we try to answer it in this research, is whether narcissism in managers will increase the risk of firm bankruptcy. Also, as mentioned, narcissistic managers' decisions can affect how information is prepared and disseminated. Therefore, another question that will be addressed in this research is whether managers' narcissism affects the firm's earning quality.

2. Theoretical foundations of research

2.1. Manager narcissism and earning quality

Psychological research refers to narcissism as a persistent mental disorder whose primary focus is on extreme self-love and disregard for the desires of others. Narcissists are usually arrogant, self-righteous, exploitative, and authoritarian and do not allow others to show off (Buchholz et al., 2020). When such people are placed at an organization's head as managers, they usually manipulate and manage earnings more than other managers with typical behavioral characteristics to show their performance better than it is. Narcissistic managers find themselves gripped with the law and, as a result, ignore many rules and exaggerate more about their achievements than other managers (Capalbo et al., 2018). Narcissistic managers often look for ways to make financial statements more desirable than reality and show their superior knowledge to the market (Kontesa et al., 2021). They make financial decisions based on personal interests and usually pay little attention to concepts such as transparency, honesty, ethics and the rights of other stakeholders. This will significantly affect the quality of the company's earnings (Ham et al., 2017; Bazrafshan et al., 2019; Lin et al., 2020).

Also, narcissistic managers are not interested in publishing important information and do not want to publish negative news about the company. Also, these managers usually publish information that they think can show their performance well. The presence of these managers will increase information asymmetry and increase information risk in the company (O'Reilly et al., 2018). On the other hand, narcissistic managers may manage earnings to show the company's condition better and thereby increase the sustainability of earnings (Khajavi et al., 2017). Although the reported earnings are not real, this will increase the earning predictability. They may even publish information faster than other managers in order to attract the attention and admiration of others (Akbarloo et al., 2020). Therefore, it cannot be expected that the presence of a narcissistic manager will reduce the quality of earnings from all dimensions, and this issue needs to be carefully investigated. According to this, four criteria (earnings stability, earnings predictability, earnings relevance, and earnings timeliness) have been used in this research to measure earning quality. Therefore, and according to the stated content, the following hypotheses are proposed:

H1: Managers' narcissism significantly impact earning stability
H2: Managers' narcissism significantly impact earning predictability
H3: Managers' narcissism significantly impact earnings relevance
H4: Managers' narcissism significantly impact earnings timeliness

2.2. Manager narcissism and bankruptcy risk

Researchers have repeatedly shown that CEO narcissism is associated with bold and high-risk strategies (high-risk, high-yield). Also, they have shown that CEO narcissism is associated with various unnecessary expenses and uncertain returns (Meisel et al., 2016; Buelow & Brunell, 2018; Buyl et al., 2019; Leder et al., 2020). Due to their specific behavioral characteristics, these managers usually make financial decisions based on personal feelings and do not believe in the expert work of their advisors. They generally make sudden decisions that can lead to severe financial crises (Chatterjee & Hambrick, 2011; Zhu & Chen, 2015). Wales et al. (2013) found that narcissistic CEOs describe their organizations as having high levels of innovation, activism, and risk-taking in accepting strategic opportunities. This act imposes much cost on the company, but they are ready to pay the price to demonstrate this.

Gerstner et al. (2013) also have shown that, despite their inherent risk-taking, more narcissistic CEOs are prone to adopting new and unproven technologies. Also, in decisions about financing, investing, and keeping cash, managers usually put risky and bold strategies on their agenda. For example, studies have shown that narcissistic managers are very interested in investing in high-risk projects and usually do not pay attention to the rate of return on investment or its expected return on the risk imposed to finance these investments (Buelow & Brunell, 2018; Aabo & Eriksen, 2018). They make decisions to satisfy their sense of power and show off their abilities. In this way, they ignore the dangers that exist with the idea that they can solve any problem (Kim et al., 2018).

Other evidence of studies conducted in this field indicates that narcissistic managers have a great tendency to highlight their role in the annual report and appear more in the media. They attribute positive things to themselves and consider themselves deserving of more rewards (Chatterjee & Hambrick, 2007). Narcissists also see themselves as superior men to whom the usual rules do not apply (Norberg, 2009). This belief can increase the probability of performing unethical activities such as false financial reporting and be a justification for them (Zyglidopoulos et al., 2009; Chen, 2010). In most cases, it has been observed that narcissistic managers seek to achieve outstanding achievements in the company. They are driven toward implementing bold strategic, operational measures and doing risky business so that these decisions will lead to significant profits or losses at the end of the financial year (Chatterjee & Hambrick, 2007; Olsen et al., 2014; Olsen & Stekelberg, 2016). Therefore, if the manager's predictions are wrong and the expected results are not obtained, the company may face a financial crisis, eventually reducing its ability to repay its obligations and increasing the risk of bankruptcy. Based on this, the fifth research hypothesis is proposed as follows:

H5: Managers' narcissism significantly impact the firm's bankruptcy risk

2.3. Research background

Bazrafhan et al. (2015) conducted a study entitled "The effects of managers' narcissism on the quality of financial reporting." In this study, they used the criteria of signature size and reward ratio of managers as measures to calculate the narcissism of managers. Three criteria measured this study's financial reporting quality: earnings quality, earning management, and conservatism. The research data were collected from 2009 to 2016 and analyzed using multiple regression. The results showed that signature size as one of the criteria of narcissism has no significant relationship with the quality of financial reporting. However, other results showed that another criterion of narcissism (managers' reward ratio) has a significant effect on earning management (positive) and earning quality (negative).

Taheri Abed et al. (2016) conducted a study entitled "The effects of CEO narcissism on financial reporting transparency." In this study, the signature size criterion was used to measure the narcissism of managers. Also, a multidimensional criterion that covers a wide range of concepts related to transparency has been used to measure the quality of financial reporting. The results showed that managers' narcissism has a negative effect on financial reporting transparency. Other results also showed a negative and significant relationship between managers' overconfidence and financial reporting transparency.

Ham et al. (2017) examined the impact of managers' narcissism on the quality of financial reporting. This study used the size of managers' signatures to measure narcissism. They concluded that narcissism has a significant relationship with earning management. This result shows the importance of managers' personality traits in financial reporting decisions.

Ham et al. (2018) examined the relationship between narcissism, investment, and company performance in a study. In order to measure narcissism in managers, the criterion of CEO size was used. They concluded that narcissism in managers has a negative and significant relationship with many of the company's outputs. They also stated that narcissism is significantly related to investment policies and corporate performance. Other results of their research showed that narcissism has a significant relationship with over-investment, especially in research and development costs. Companies with narcissistic executives also experience lower productivity, earning ability, and operating cash flow.

Sedaghati (2019) conducted a study entitled "Study of the relationship between managers' narcissism and corporate risk management." In this review article, the author showed that narcissism is a personality structure that will cause a person to be biased in decisions and seek to influence personal desires and seek answers from others. Narcissistic managers often seek to achieve great results, and in order to achieve this goal, they may take bold and risky actions. These measures will increase the company's risk and may also increase the company's earning ability.

In a study, Akbarloo et al. (2020) examined the relationship between managers' narcissism and the optimistic tone of financial reporting by considering the adjusting role of earnings management. In order to measure narcissism, the criteria of managers' reward ratio and their signature size were used. In this regard, data related to 115 companies from 2011 to 2018 were collected and analyzed using the ordinary least squares regression method. The results showed that managers' narcissism has a positive and significant effect on the optimistic tone of financial reporting.

In a study, Dita et al. (2020) examined the effect of CFO narcissism on internet financial reporting and earnings quality. For this purpose, data on 60 manufacturing companies listed on the Indonesia Stock Exchange in the 2018 period have been collected. This study has used the debt-to-assets ratio and company size as control variables. The results showed that managers' narcissism is significantly related to accrued earnings management. On the other hand, other research has shown that organizations with highly narcissistic executives disclose more financial information over the Internet.

In a study, Kontesa et al. (2021) investigated the role narcissism in corporate leadership has on earnings management for 514 listed companies in Bursa Malaysia between 2009 and 2015. Using the unobtrusive method and robust panel regression, they found that narcissistic CEOs correlate positively with earnings management. It means that a narcissistic CEO tends to manage corporate earnings to fulfill their ego, which brings a new perspective to agency theory. For shareholders, the number of CEO photographs in the annual report may be an early warning sign of self-centric earnings management.

In previous research, the effect of the CEO's narcissism on various aspects of the company, such as the quality of financial reporting, transparency, and earnings management, has been investigated. However, none of the research has specifically investigated the effect of manager narcissism on earnings quality. Besides, in this research, four criteria (earnings stability, earnings predictability, earnings relevance, and earnings timeliness) have been used to measure the earning quality. This will cause a broader dimension of earnings quality to be examined and more accurate results. Each of these criteria is different, and the results of each of them are interesting. For example, a narcissistic manager may engage in earning management to make his performance appear better than it is. In this way, the predictability of earnings also increases. But, other dimensions of earning quality may decrease. Also, if the conditions of the company are not stable and he makes wrong financial decisions, he may lead the company to bankruptcy. Also, regarding the effect of managers' narcissism on the company's performance, researchers such as Ham et al. (2018) have conducted research and shown that the manager's narcissism in a company is considered a bad sign and has a negative effect on the company's performance. However, none of the researchers have investigated the impact of managers' narcissism on the bankruptcy risk of companies. In addition, we are conducting this research in the companies admitted to the Tehran Stock Exchange, which is also different from the previous research regarding the geographical area. Due to the existence of economic sanctions against Iran and the specific economic conditions of this country, it is expected that the results obtained in this research can contribute to the completion of previous research and related theories in the field. Another important distinction of this research compared to previous ones is that we examined the two factors of earnings quality and bankruptcy risk simultaneously and in the same place to obtain more accurate and complete results. It is also possible to compare the results obtained for two variables. This will help to clarify the dimensions of managers' narcissism.

3. Methodology

This research is quasi-experimental research of post-event type, which falls into the field of positive accounting research based on factual information. The type of research data is historical (post-event), and the research methodology is descriptive-correlation in terms of the nature of implementation. We used library sources (books, articles, and journals), academic theses, reputable international publications on websites, and other valid scientific databases to collect data on the theoretical foundations of research, literature review, and research background. A multivariate linear regression model was used to test hypotheses using combined data. The research period is ten years, from 2012 to 2021, including 177 listed companies.

Research data was extracted annually from Rahavard Navin 3 software. This software contains complete information on companies accepted on Tehran Stock Exchange. Also, the photos and signatures of CEOs were obtained from the companies' financial statements that are available on the Codal website. After performing calculations in EXCEL software to calculate research variables, the collected data were entered into EViews software to check hypotheses.

It should be noted that the data is a mixed type (panel data), and therefore there is no problem of heterogeneity of variance in the fitting of the research models. The reliability of the data related to the research variables was checked through the unit root test. Research models were fitted through multiple linear regression. We used t-statistics to check the significance of relationships between independent and dependent variables and F-statistics to check the significance of the whole model. The coefficient of determination was used to check the intensity of the influence of independent variables on the dependent variable. Durbin-Watson's statistic was used to detect the presence or absence of autocorrelation between residuals of the model. In the research findings section, descriptive statistics are presented. Also, by analyzing the data, research hypotheses have been checked with the help of the t-test. EViews software was used for data analysis.

3.1. Statistical sample

The study's statistical population included all companies listed on the Tehran Stock Exchange. The following conditions were designed to select a statistical sample considering the extension of the statistical population and some inconsistencies of its members: (1) companies should have been listed on the stock exchange before 2011, and their shares should have been traded on the stock exchange and still be traded from the beginning of 2011; (2) companies should not have faced an operational interruption from 2012 to 2021. Their fiscal and solar years should be the same (to increase the comparability level); and (3) companies should not have changed their fiscal year during these years, and their required information must be available for extracting the data.

By applying the above constraints, the companies of the statistical research sample with similar features were obtained from the statistical population. The statistical sample was chosen purposefully with a systematic elimination method. Thus, the final sample consisted of 177 companies.

3.2. Research variables

3.2.1. Narcissism

We utilized two criteria of managers' photos and managers' signatures in our study to assess the narcissism level of managers, similar to the research conducted by Wong et al. (2011), Olsen and Stockelberg (2016), Lewis et al. (2012), Jia et al. (2014) and Ham et al. (2018).

In this research, the testosterone index was used to measure the narcissism of managers. We measure each CEO’s testosterone exposure as the distance of the CEO’s face width divided by the height of the face, which is measured as dividing the distance between two temples (face width) by the distance between the eyebrows and the upper lip (face height). The ratio of width to height measurement is represented as WHR. Prior studies show that WHR is a valid cue to testosterone-related behaviors in men (Wong et al., 2011; Lewis et al., 2012; Jia et al., 2014; Carré et al., 2009; Short et al., 2011; Weston et al., 2007). Consistent with this, Stirrat and Perrett (2010) demonstrated that measuring the human face width to length ratio (ratio of width to height) is a characteristic of sexual dimorphism and testosterone, which can be used as a factor to measure the tendency to violent and aggressive behavior in men. Also, many studies have confirmed the direct relationship between narcissism and anger, hostility, and aggression in adults and believe that the level of narcissism among people has a positive relationship with testosterone and cortisol (Twenge & Campbell, 2003; Donnellan et al., 2005; Pfattheicher, 2016).

Prior studies show that WHR is a valid cue to testosterone-related behaviors in males (Carré, Putnam, and McCormick 2009, Short et al. 2012, Weston et al. 2007, Wong et al. 2011). Carré and McCormick (2008) show that WHR can be measured from photographs (instead of measuring the skull directly) and that this ratio predicts aggressive behavior inside and outside the laboratory. An important caveat applies: whether individual differences in the facial width-to-height ratio vary according to testosterone levels at puberty is still speculation and subject to debate. However, as already discussed, the relation between WHR and aggression or deception propensity has been well documented. Ultimately, this cue to aggression and deception that we need to derive our predictions regarding narcissism. Lewis et al. (2012) also showed that the ratio of facial width to height is associated with violence and aggression, immoral behavior, profiteering in business, and sovereignty. Recent research has suggested that testosterone levels in men are related to their level of narcissism (Pfattheicher, 2016). Accordingly, several studies in recent years have used the image criterion of managers to measure their degree of narcissism in them (Zakerean, 2021; Shahedhossein et al., 2021; Hossein, 2020; Aabo et al., 2020, Jia et al., 2014).

Figure 1 – The process of measuring testosterone levels index

(Adapted from Jia et al., 2014)

In this research, in addition to the CEO's photo, the CEO's signature index was also used to measure narcissism. Using two measurement criteria for one variable can help us find more accurate and reliable results. The relationship between narcissism and signature size has a long history in psychology (Zweigenhaft, 1973; Jorgenson, 1977; Zweigenhaft, 1977). Semiologists and psychologists believe that the way people sign can reveal some of their characteristics. The results of research in this area show that larger signatures are related to narcissistic personality traits such as dominance over others, arrogance, self-confidence, a sense of entitlement, the expectation of being admired, and fantasies related to great power (Zwingenhoff, 1977). Psychologists suggest that narcissists have larger signature sizes. Ham et al. (2017) observed similar results through the 40-question narcissistic personality questionnaire (NPI-40), compared to the method of measuring the size of managers' signatures. In this way, managers with higher narcissism scores using the narcissistic personality questionnaire had a larger signature size. According to the said contents, in this research, like Ham et al. (2018), O'Reilly et al. (2017), and Ham et al. (2017), signature size has been used as a measure of narcissism. To measure narcissism, according to research (Ham et al., 2017), the area of each signature was measured using Image-j software. For this purpose, the signatures of CEOs were first extracted from the financial statements of sample companies. A rectangle was drawn around each sample signature so that the corners of the rectangle were closest to the individual's signature. Then the width and length of the rectangle were determined based on centimeters. In order not to consider the names of managers in the volume of signatures, the names of managers were ignored (Ham et al., 2018).

3.2.2. Earning quality

The research's second independent variable is the earnings quality in the studied companies. This research uses four criteria of earnings stability, earning predictability, earnings relevance to stock value, and timely earnings as earnings quality criteria.

Earning stability: Earning stability means the reproducibility and continuity of current earnings. The higher the earning stability, the more the company can maintain current earnings, and it is assumed that the quality of the company's earnings is higher (Saghafi & Kurdistani, 2003). The earnings that are continuous and operational are more sustainable. Financial analysts do not consider accrual accounting earning the only determining indicator and prefer stable and reproducible earning. From the perspective of financial analysts, continuous and operating earning components have better information than non-operating and non-operating items and can better predict future cash flows. The more significant coefficient of earning variable in earning regression and return indicates higher-earning stability. The following model will be used to evaluate earning sustainability.

$$E_{jt} = B_{0,j} + (B_{1,j})(E_{j,t-1}) + e_{j,t}.$$

The coefficient of Ejt, B1, j in the above model, which is a first-order autoregressive model, represents earning stability. This model is estimated to be rotational (periodic) for eight years to evaluate the earning ability of each year. In this method, one-year data is deleted from the beginning of the research period, and one-year data from the final years are added. For example, based on the data for 2013 to 2020, the earning stability of 2020 is evaluated, and based on the data for 2013 to 2018, the earning stability of 2018 is calculated and evaluated. When the value obtained for the coefficient of explanatory variable B1, j is closer to one, earning stability is higher. When it is closer to zero, the earning ability is more temporary (Kurdistani & Majdi, 2007).

Earning predictability: This is considered part of the earning ability feature and helps predict the future better using past information. Accounting information must have a high degree of predictability if it is applicable. Francis et al. and Kurdistani and Majdi (2007) used the following model to evaluate earning ability.

$$\sqrt{\delta^{2}(vj)} = \text{Predictability}$$

After estimating the first model, the square root of the error is calculated, and the more (less) values obtained indicate that the earning predictability is less (more). Based on this, the coefficient of determination resulting from the model represents the ability to predict earning (Kurdistani & Majdi, 2007).

3.2.3. Earnings relevance

In creating stock changes, earning is one of the best indicators for measuring the company's activity. Therefore, reported earnings should help investors determine the value of the company. Earning will be related to the value of the stock if it can explain the changes in returns.

$$RET_{j,t}=B_{0,j}+(B_{1,j})(E_{j,t})+(B_{2,j})\ \Delta\ E_{(j,t)}+e_{j,t}$$

The coefficient of determination obtained from the estimation of the above model is considered an indicator of the characteristic of earning ability related to stock value. Relevance shows the explanatory power of changes in stock returns by accounting earnings (Kurdistani & Majdi, 2007).
Earning timeliness: Earning must be available on time for effectiveness. Timeliness of earnings leads to realistic returns and, if presented at short intervals, reduces information risk. Accounting earning seeks to measure economic earning, which changes the stock market's value. The explanatory power of earnings in the region indicates the timeliness of earnings.

$$E_{j,t}=B_{0,j}+B_{1,j}(NEG_{j,t})+B_{2,j}(RET_{j,t})+(B_{3,j})(NEG_{j,t})*RET_{j,t}+e_{j,t}$$

The coefficient of determination of this model with a negative sign indicates the timely nature of earning. Higher values mean less earning on time. (Ibid., p. 94).

3.2.4. Bankruptcy risk

In this study, the dependent variable is bankruptcy risk. The audit analysis model (native by Kurdistani and Tatli) has been used to identify the risk of bankruptcy. Kurdistani and Tatli (2014), in their research, considering the economic environment of Iran, proposed the following model:

$$MDA = 0.626\ (RE) + 0.137\ (EBIT) + 0.679\ (P) - 0.583\ (L)$$

EBIT: Ratio of operating earnings to total assets
P: Ratio of net earnings (loss) to total assets
L: The ratio of total liabilities to total assets

In this model, if the value of M obtained for a company is less than -0.5, the probability of bankruptcy is very high. If it is between -0.5 and -0.3, the probability of bankruptcy is low, and if it is more significant than -0.3, the probability of bankruptcy is very low. Therefore, the value obtained, which is the dependent variable of this study, is an inverse measure of bankruptcy risk, so the higher the value, the lower the risk of bankruptcy.

3.2.5. Control variables

Company size: To measure the size of the company, the natural logarithm of the company's total assets was used.
Company performance: Company performance is equal to net earnings divided by total assets
Market value to book value: To measure this variable, the day value of equity was divided by the book value of equity.
Financial leverage: equals total liabilities divided by total assets

4. Research findings

The research data were extracted annually from the Codal website, which was entered in the EVIEWS10 software following calculations in EXCEL software to examine the research relationships and hypotheses. It should be noted that the data were of the combined (panel) type. Therefore, we would not encounter the problem of heteroskedasticity in fitting the research models. The reliability of data related to the research variables was examined by the unit root test. The research models were fitted through multiple linear regressions. The t-statistic and F-statistic were used to examine the significance of the relationships between independent and dependent variables and the significance of the whole model, respectively. Also, the coefficient of determination was employed to assess the impact rate of independent variables on the dependent variable, while the Durbin-Watson statistic was applied to determine the presence or absence of autocorrelation between the model residues.

4.1. The statistical description of research variables

The criteria, including the mean, median, standard deviation, skewness, and kurtosis were used to statistically describe the studied variables. The statistical description test results are given in Table 1.

Table 1 – The statistical description of the research variables

Variable Name	**Bankruptcy Risk**	**Narcissism (Manager's Photo)**	**Narcissism (Manager's Signature)**	**Company Size**	**Company Performance**	**Market to Book Value Ratio**	**Financial Leverage**
Variable	RISK	FACE	SIGN	SIZE	ROA	MTB	LEV
Mean	-0.1598	1.860	24.93170	14.59147	0.0924	2.993390	0.493823
Median	-0.1593	1.859	24.67595	14.56348	0.0923	2.980801	0.489821
Maximum value	1.109	3.122	58.88372	29.97966	0.355	7.042356	1.052963
Minimum value	-1.169	0.609	7.115371	0.255497	-0.186	0.009123	0.004476
Standard deviation	0.321	0.412	9.160073	4.787489	0.085	1.218024	0.187388
Skewness	-0.011	0.114	0.064062	-0.017785	-0.039	0.037108	0.066483
Kurtosis	2.932	2.887	2.901100	3.015376	2.964	2.707438	2.763460

Variable Name	**earning predictability**	**earnings relevance**	**earning stability**	**earnings timeliness**
Variable	Predict	Relevance	Stability	Timeliness
Mean	0.7881	0.5855	0.5706	0.6044
Median	0.7901	0.5710	0.5713	0.6008
Maximum value	1.7020	1.2260	1.2480	1.2433
Minimum value	0.0089	0.0023	0.0031	0.0185
Standard deviation	0.2615	0.2195	0.2070	0.1975
Skewness	0.0040	0.1629	0.1063	0.0513
Kurtosis	2.911	2.782	3.052	2.8273

Table 2- Correlation between independent research variables

	FACE	**SIGN**	**SIZE**	**LEV**	**MTB**	**ROA**
FACE	1	0.01798068099	0.05613246339	-0.01886301893	0.03911327961	-0.02353656212

SIGN	0.01798068099	1	0.05774835708	-0.01579095491	0.01904286992	-0.02545922892
SIZE	0.05613246339	0.05774835708	1	0.01271949296	0.05532071862	0.03589914913
LEV	-0.01886301893	-0.01579095491	0.01271949296	1	-0.01653752959	0.02366094413
MTB	0.03911327961	0.01904286992	0.05532071862	-0.01653752959	1	-0.02526567334
ROA	-0.02353656212	-0.02545922892	0.03589914913	0.02366094413	-0.02526567334	1

4.2. Examining the reliability of the research variables

The reliability of the research variables was assessed by the unit-roots test. The results are provided in Table 3.

Table 3 – Unit roots test

The unit root test of the panel data		
H0: There is a unit root		
	Statistic	Significance level
Narcissism (manager's photo)	716.789	0.000
Narcissism (manager's signature)	778.426	0.000
Bankruptcy risk	734.162	0.000
earning stability	742.531	0.000
earning predictability	710.064	0.000
earnings relevance	782.612	0.000
earnings timeliness	780.216	0.000
Company's size	908.321	0.000
Company's performance	856.227	0.000
Market value to book value ratio	664.637	0.000
Financial leverage	875.110	0.000

All variables are at the static level and the null hypothesis, implying the existence of a unit root and non-static (non-stationary) variables is rejected at the 95% confidence level.

4.3. Chow and Hausman tests

The panel data method was used to evaluate the correlation.

H0: Equality of the y-intercepts (the y-intercepts are equal)

H1: Absurd hypothesis (inequality of the y-intercepts)

The test results revealed that the Chow test statistic value was lower than 0.05, and thereby, the null hypothesis is rejected. Therefore, the panel model was chosen as the superior model (the fixed effects model was selected as the preferred model). Now, the fixed effects model needs to be tested against the random-effects model. The Hausman test was used to do this Table 4.

Table 4 – The results of Chow and Hausman tests

Hypothesis	Dependent variable	Chow test significance level	Hausman test significance level	Model fit

Research hypothesis	Bankruptcy risk	0.000	0.000	Panel model with fixed-cross-sectional effects
Research hypothesis	earning stability	0.000	0.008	Panel model with fixed-cross-sectional effects
Research hypothesis	earning predictability	0.000	0.026	Panel model with fixed-cross-sectional effects
Research hypothesis	earnings relevance	0.000	0.000	Panel model with fixed-cross-sectional effects
Research hypothesis	earnings timeliness	0.000	0.000	Panel model with fixed-cross-sectional effects

4.4. Research Hypotheses

4.4.1. Managers' narcissism significantly impacts earning stability.

Table 5 – Fitting the model of the first hypothesis

Dependent Variable: stability

Method: Panel Least Squares

Date: 08/11/21 Time: 00:09

Sample (adjusted): 2012 2021

Periods included: 10

Cross-sections included: 177

Total panel (balanced) observations: 1770

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.471033	0.136570	-3.449033	0.0006
FACE	0.220505	0.106564	2.069234	0.0388
SIGN	0.000670	0.000101	6.640957	0.0000
SIZE	0.001145	0.000887	1.291220	0.1969
LEV	0.000609	0.000932	0.653278	0.5137
MTB	0.080517	0.021021	3.830229	0.0001
ROA	0.006339	0.004919	1.288754	0.1978
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.779488	Mean dependent var		0.500738
Adjusted R-squared	0.753382	S.D. dependent var		0.520458
S.E. of regression	0.012941	Akaike info criterion		-5.700542
Sum squared resid	0.147044	Schwarz criterion		-4.839812
Log likelihood	3210.988	Hannan-Quinn criter.		-5.374361

F-statistic	9372.651	Durbin-Watson stat	1.527206
Prob(F-statistic)	0.000000		
Inverted AR Roots	.33	-.33	

The results of examining the first hypothesis of the study showed that managers' narcissism significantly affects earning stability. Also, considering the positive coefficient of independent variables in this model, earning stability will increase with the increase of narcissism in managers.

4.4.2 Managers' narcissism significantly impacts earning predictability.

Table 6 – Fitting the model of the second hypothesis

Dependent Variable: predictability

Method: Panel Least Squares

Date: 08/11/21 Time: 00:13

Sample (adjusted): 2011 2021

Periods included: 10

Cross-sections included: 177

Total panel (balanced) observations: 1770

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.458075	0.254311	-5.733426	0.0000
FACE	0.678578	0.186561	3.637297	0.0003
SIGN	0.004236	0.000142	29.84935	0.0000
SIZE	0.003170	0.002733	1.159757	0.2464
LEV	0.000127	0.002218	0.057316	0.9543
MTB	0.013768	0.031839	0.432425	0.6655
ROA	0.005104	0.011559	0.441565	0.6589

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.694885	Mean dependent var	0.420649
Adjusted R-squared	0.693997	S.D. dependent var	0.419517
S.E. of regression	0.032503	Akaike info criterion	-3.878738
Sum squared resid	1.114528	Schwarz criterion	-3.118077
Log likelihood	2586.878	Hannan-Quinn criter.	-3.592656
F-statistic	1121.251	Durbin-Watson stat	2.497875
Prob(F-statistic)	0.000000		
Inverted AR Roots	-.29		

The results of examining the second hypothesis also showed that managers' narcissism has a positive and significant effect on earning predictability. The number obtained for the coefficient of determination also shows that the independent variables of the research justify 69.4% of the changes of the dependent variable.

4.4.3. Managers' narcissism significantly impacts earnings relevance.

Table 7 – Fitting the model of the third hypothesis

Dependent Variable: relevance				
Method: Panel Least Squares				
Date: 08/10/21 Time: 23:51				
Sample (adjusted): 2011 2021				
Periods included: 10				
Cross-sections included: 177				
Total panel (balanced) observations: 1770				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.502262	0.041202	-12.19021	0.0000
FACE	0.306815	0.029709	10.32735	0.0000
SIGN	0.002066	0.000173	11.93652	0.0000
SIZE	0.353440	0.511681	0.690742	0.4899
LEV	0.000110	0.000233	0.473913	0.6357
MTB	0.067965	0.005611	12.11224	0.0000
ROA	0.000971	0.001227	0.790991	0.4291
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.799872	Mean dependent var		0.330225
Adjusted R-squared	0.792850	S.D. dependent var		0.323567
S.E. of regression	0.003960	Akaike info criterion		-8.089131
Sum squared resid	0.016540	Schwarz criterion		-7.328470
Log likelihood	5195.216	Hannan-Quinn criter.		-7.803048
F-statistic	45170.58	Durbin-Watson stat		2.389775
Prob(F-statistic)	0.000000			
Inverted AR Roots	.46			

Examining the third hypothesis of the research shows that narcissism in managers has a significant effect on earning relevance. This relationship is directly due to the positive coefficient obtained. Therefore, with the increase of narcissism in managers, the degree of relevance of earnings will also increase.

4.4.4. Managers' narcissism significantly impacts earnings timeliness.

Table 8 – Fitting the model of the fourth hypothesis

Dependent Variable: timeliness				
Method: Panel Least Squares				
Date: 08/11/21 Time: 00:17				
Sample: 2011 2021				
Periods included: 10				
Cross-sections included: 177				
Total panel (balanced) observations: 1770				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.251274	0.073488	-17.02703	0.0000
FACE	0.534527	0.054378	9.829791	0.0000
SIGN	0.007829	0.000384	20.39613	0.0000
SIZE	0.216800	0.216155	1.002984	0.3161
LEV	0.000312	0.000549	0.569695	0.5690
MTB	0.228829	0.008552	26.75675	0.0000
ROA	0.004424	0.002856	1.549349	0.1216
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.779802	Mean dependent var		0.610573
Adjusted R-squared	0.779773	S.D. dependent var		0.578354
S.E. of regression	0.008712	Akaike info criterion		-6.528254
Sum squared resid	0.093573	Schwarz criterion		-5.849036
Log likelihood	4805.004	Hannan-Quinn criter.		-6.274491
F-statistic	34261.00	Durbin-Watson stat		1.736120
Prob(F-statistic)	0.000000			

Examining the fourth hypothesis of the research also shows the positive and significant effect of managers' narcissism on the timeliness of earnings. The coefficient of determination in this hypothesis shows that 0.77 of the changes in the dependent variable of the research (timely earning) are explained by independent variables.

4.4.5. Managers' narcissism significantly impacts the firm's bankruptcy risk.

Table 9 – Fitting the model of the fifth hypothesis

Dependent Variable: RISK
Method: Panel Least Squares
Date: 08/11/21 Time: 00:07
Sample: 2011 2021
Periods included: 10

Cross-sections included: 177

Total panel (balanced) observations: 1770

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.076281	0.066500	31.22226	0.0000
FACE	-1.174858	0.049208	-23.87545	0.0000
SIGN	-0.013975	0.000794	-17.60932	0.0000
SIZE	-0.022950	0.078082	-0.293917	0.7689
LEV	-0.000471	0.000496	-0.948451	0.3431
MTB	0.032556	0.007739	4.206758	0.0000
ROA	0.000232	0.002584	0.089805	0.9285
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.659477	Mean dependent var		-0.159823
Adjusted R-squared	0.649400	S.D. dependent var		0.321796
S.E. of regression	0.007883	Akaike info criterion		-6.728080
Sum squared resid	0.076624	Schwarz criterion		-6.048861
Log likelihood	4946.481	Hannan-Quinn criter.		-6.474317
F-statistic	12948.38	Durbin-Watson stat		1.805916
Prob(F-statistic)	0.000000			

The fifth hypothesis was also confirmed. Given that the coefficient of independent variables is negative, the quality of this relationship is inverse. However, according to the model used to measure bankruptcy risk, we know that the calculated criterion is an inverse measure of bankruptcy risk. So, the higher the amount, the lower the risk of bankruptcy. As a result, the relationship quality is logically direct and meaningful. Therefore, the null hypothesis is not accepted, and managers' narcissism positively and significantly impacts the company's bankruptcy.

5. Conclusion

Examining the study's first hypothesis showed that managers' narcissism significantly affects earning stability. Also, considering the positive coefficient of independent variables in this model, earning stability will increase with the increase of narcissism in managers. According to Wallace and Zimmerman (1990) and Fields et al. (2001), earnings quality can be affected by the flexibility of accounting choices using accepted accounting principles. Narcissistic managers can use these powers to improve the apparent earning ability of the company and thus show their performance better than it is. Therefore, narcissistic managers will try to report smooth earning ability by engineering the company's earnings and thus show their managerial role in improving its performance. Bamber (2010) also states that managers' personality traits, such as overconfidence or narcissism, can lead to implementing disclosure and accounting policies with fixed effects through which it can improve their performance and show positively and naturally. Olsen et al. (2014) also concluded that narcissistic managers show more reported earnings by changing their actual activities. Therefore, in different periods of their activity, these managers will try to report the reported earnings in any way possible, even more than in the previous period, thus increasing the stability of the company's earnings.

The results of the second hypothesis showed that managers' narcissism has a significant effect on earnings predictability. This result is in line with the research of Ham et al. (2017), Alktamine et al. (2017), Bazrafshan et al. (2019), and Dita et al. (2020). As mentioned in the previous section, narcissistic managers always try to show the company's income level under their management to be smooth and stable for various reasons. This factor will increase the earning ability of these companies, and the internal and external stakeholders will be able to predict the company's future earnings with more confidence.

The third hypothesis showed that managers' narcissism significantly affects earnings relevance. The earnings relevance criterion indicates how stock price or return as a dependent variable is directly related to earnings per share or book value per share. When this relationship is direct and meaningful, it can be said that accounting earnings can be the basis for investors' decisions. This data can influence their decision to buy, hold or sell shares. In companies with narcissistic managers, earnings will be related to the value of stocks due to the increase in earnings stability and the ability to predict earnings. This result is in line with Dita et al.'s (2020) research but contradicts the research of Bazrafshan et al. (2019). They concluded that increasing managers' narcissism level would decrease the quality of earnings.

Examining the fourth hypothesis of this study also showed that managers' narcissism significantly affects the timeliness of earnings. This finding is consistent with the results of research by Ham et al. (2017), Bazrafshan et al. (2019), and Dita et al. (2020). Narcissistic managers often try to expose their activities to others as quickly as possible because of their overconfidence and to disclose earnings as quickly as possible.

The fifth hypothesis showed that managers' narcissism positively and significantly affects the company's bankruptcy risk. This means that with the increase of narcissism in managers, the company's risk of bankruptcy will increase. This finding agrees with previous experimental research such as Ham et al. (2018). A narcissistic manager uses his skills and abilities to deceive, influence, and threaten employees. Such managers are ignorant and indifferent to the company's actual needs. They believe that they deserve praise, attention, and praise more than what they receive from the employees. Managers' extreme self-centeredness and lack of empathy often lead to a lack of trust in employees. This lack of trust and a strong need for power and fame make the narcissistic leader use more control to protect himself. In this way, it can cause irreparable damage to the company. Also, narcissistic managers do not use consultants and experts in different fields in making decisions and choosing the right strategy for the company. They usually think of themselves as superior to others and do not see the need to be consulted. Also, choosing bold and risky strategies in different fields makes the company suffer a financial crisis. These managers usually do not pay attention to the warnings and limitations inherent in the company. Therefore, they may make decisions that cause the company to suffer severe crises, cause irreparable damage to the company and increase the risk of bankruptcy.

As the results of this study showed, the narcissism of the manager is like a double-edged sword that can improve some parameters of the organization, such as quality of earning, but on the other hand, can be stubborn, not following the collective logic, pride, and self-centeredness, pulling the company into the abyss. The existence of narcissistic managers in the organization can have two positive and negative dimensions. While arrogant, selfish, and self-centered, narcissistic managers are often brilliant, hard-working, and outstanding in their field. Their narcissistic traits neutralize their creative talent for the organization. Therefore, the presence of these managers in the organization will increase the quality of earnings and, on the other hand, increase the risk of bankruptcy. Therefore, the following suggestions will be presented: (1) shareholders, investors, analysts, and other internal and external stakeholders of the company should not pay attention only to the earning quality components to analyze the company's actual situation. However, consider other financial aspects of the company such as liquidity status, financial strategies, capital structure, etc.; (2) shareholders are suggested to consider the personal characteristics and background of the company manager in their decisions in order to buy, hold or sell shares; (3) to select managers, it is suggested that companies' board of directors consider their personality traits, such as narcissism, overconfidence, etc., as an essential factor in the company's future. In addition to reducing the risk of investing and preventing the risk of bankruptcy, this oversight will also increase financial soundness and information transparency; (4) real shareholders are advised not to consider only the projected earning or the company's past earnings in their decisions because, as mentioned, earning may be due to subjective and far-fetched estimates or management manipulation and never does not occur; and (5) it is recommended to the Securities and Exchange Commission that, to reduce the risk of bankruptcy of companies accepted in this organization, mechanisms to monitor the activities of managers, especially activities such as preparing financial statements that could have severe consequences for investors and companies.

5.1. Suggestions for further research

We suggest the following for future research, to investigate: (1) the relationship between manager narcissism and financing constraints; (2) the relationship between managerial narcissism and the company's financial and non-financial performance; (3) the relationship between stock price crash risk and bankruptcy risk by considering the manager's characteristics as a moderating variable; (4) the relationship between bankruptcy risk and stock liquidity by considering the type of industry as a moderating variable; (5) a model of factors affecting bankruptcy risk and stock prices with emphasis on the personality traits of the manager; (6) the effect of industry type on the relationship between manager narcissism and bankruptcy risk; (7) the effect of CEO characteristics on the risk of falling stock prices and bankruptcy risk; and (8) the effect of a manager's narcissism on the quality and cost of auditing.

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