



Moderating impact of information presentation format on the relationship between emotional intelligence and judgment decision-making quality of investors

Zahra Mirzazadeh

PhD student, department of accounting, Damavand branch, Islamic Azad University, Damavand, Iran
Mirzazadehz2021@gmail.com

Shohreh Yazdani

Assistant Professor, Department of Accounting, Damavand Branch, Islamic Azad University, Damavand, Iran
"corresponding author"
Yazdani_82@yahoo.com

Mohammad Hamed Khan Mohammadi

Associate Professor, Department of Accounting, Damavand Branch, Islamic Azad University, Damavand, Iran
Dr.khanmohammadi@yahoo.com

Tahereh Mahmoudian Dastnaee

Assistant Professor, Department of Psychology, Behshahr Branch, Islamic Azad University, Behshahr, Iran
Ta.MD1360@iau.ac.ir

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ABSTRACT

The extant study aims to determine the impact of information presentation format on the relationship between emotional intelligence, risk-taking, self-confidence, and strategic thinking with investors' judgment and decision-making quality. The research method is analytical-correlational in terms of objective and is a quantitative and applied study in terms of the research process. The statistical population comprised individuals who had stock codes, and the sample size equaled 366 through software. The relevant standard questionnaires have been used to assess the variables. The data collected through SMART PLS/4 software were analyzed, and the results of hypotheses testing indicated that the information presentation format had no moderating impact on the hypotheses except for the first hypothesis. In other words, the information presentation format had moderating impact on the relationships between emotional intelligence and judgment decision-making quality only in the first hypothesis, which addresses the impact of emotional intelligence on self-confidence. It is recommended that standard setters and non-profit entities consider the results of this study in their decisions related to internal and external reporting information presentation to meet the management needs of the company and external users.

Keywords:

Information Presentation Format, Emotional Intelligence, Judgment Decision-Making Quality



1. Introduction

Investment is an essential factor for each country's economic growth process. The accounting information system helps investors, creditors, and government make the right economic decisions by providing them with the required information. While investors supply the capital to gain maximum return and minimum risk, the use of information prepared by the accounting system is one of the underlying requirements for the measurement of investment risk and return (Ghadrdan, Hamtani and Ali Nejad Rahmatabad., 2021). Accounting disclosure is a critical factor for financial statement users because it prepares financial reports based on the determined rules and standards to link data and information required for users and its effect on the economic decisions of individuals (Kawther 2023). Internal users need information prepared by the accounting system to make decisions about the current and future strategies of the company, while external users need this information to make decisions about investment in the company (Susanto, Afif, Maharani, Yuliani, & Aziz, 2023). Therefore, the information disclosure rate in financial reports plays a vital role in reducing uncertainty and information asymmetry (Kawther 2023). On the other hand, the information provided in different formats affects the users' attention to the accounting information. For instance, AMER2005 showed that companies use the importance of selective information disclosure to distort users' perception of information related to the company's actual performance. Bini and Jones (2008) explained that management could use improper formats or graphics with good designs to cover users' judgment (Rosdini, Sari, Amrania, Yulianingsih. 2020).

Accounting has found the importance of information presentation format in the decision-making process and many studies have shown that information presentation format can affect the judgment and decision-making quality of users. However, the unanswered questions about the information presentation format are one of the critical concerns among accounting information providers, standard setters, and information users. For this purpose, in line with technological advances, standard setters encourage companies to disclose information in new formats to improve decision-makers interests (Kelton, Pennington, and Tuttle 2010). In the opinion of researchers, accounting information transfer within

different audio, video, graphical, and other formats would result in different implications for the decision-making and judgment of users. For example, Montizaan (2020) investigated the impact of infographics on financial decisions and concluded that infographic signs improve financial information, and are useful for less-experienced investors (Montizaan 2020). Moreover, studies conducted by Aprayadute (2021) confirmed the effect of the order or information presentation on the investment decision-making quality (Susanto et al. 2023). Many studies have confirmed the impact of individual differences in information processing styles and the interactive effect between processing style and work nature on the quality of choice and decision-making. In this case, Stanovich and West (2000) expressed that individual differences are key components in understanding the difference between actual and optimal performances, and Zokai et al. confirmed this finding indicating that individual differences in information processing styles directly affect the individuals' decision-making quality.

Two main viewpoints are available in information processing methods by financial experts and individual investors: 1) investors are directed by the assumptions of efficient market hypothesis in their decisions that are traditional financial approach, and 2) cognitive factors and emotional issues are variables that affect the financial judgments of individuals that is behavioral financial approach (Cupák, Fessler, Hsu, Paradowski. 2020).

The traditional approach assumes that investors behave rationally in the decision-making process in the stock market. Accordingly, the investor receives the whole information of the market, evaluates the possible results, and expects optimal choices with the highest utility (Putu, Darmayanti, Luh, Wiagustini, Artini, Candraningrat. 2022). However, this approach cannot explain the rising number of anomalies in financial markets, so these inefficiencies led to the advent of a behavioral finance approach. The behavioral financial approach presents reliable reasons for inefficiencies occurring in financial markets and aims to explain these anomalies or irrational aspects of human behavior (Afriany, B, and Herdiany 2023). The behavioral financial approach indicates that the decision-making process is influenced by different sensory and cognitive factors among individuals with different personality types (Aren and Hamamci 2022). According to available literature about the behavioral

financial approach, emotional intelligence (EI) or EQ (emotional quotient), self-confidence, risk-taking, and strategic thinking are personal characteristics playing a significant role in decision-making. People who have high EI manage emotions accurately, make successful decisions, perceive less stress and risk, and have a high understanding of control in uncertain conditions, which leads to a lower perception of risk (Aren and Hamamci 2022). Bar et al. confirmed that EI is the underlying factor for flourishing people's potential in achieving success in life. They concluded that individuals who can perceive and control feelings and emotions have better vision, can accept their shortcomings, perceive their positive characteristics, and face higher self-confidence.

According to the study conducted by Nekoueezadeh et al. about the effect of EI and strategic thinking, as well as theoretical foundations and mentioned literature that are more described in the theoretical foundation section, the importance of the effect of EI on self-confidence, risk-taking, and strategic thinking is revealed also the impact of these factors of the quality of judgment and decision-making in investment is found.

The proposed foundations and literature about the significant impact of psychological properties and information presentation format on JDM quality and forgotten effect of information presentation format on financial reporting and the impact of psychological characteristics (EI, self-confidence, risk-taking, and strategic thinking) on the JDM quality of investors, and more importantly, effect of individuals differences in information processing style and mutual impact between information processing styles on the JDM quality and current research gaps in research literature of Iran and foreign countries have doubled the necessity of present study. Although it has been essential to examine the mentioned issues, no study has investigated the impact of information presentation format of financial reporting as a variable moderating the relationship between psychological factors and quality of JDM of investment unfortunately. For this purpose, the researcher selected the main problem and objective of this study based on the impact of information presentation format- as the variable moderating the relationship between EI, self-confidence, risk-taking, and strategic thinking (psychological variables)- on JDM quality to enhance information and innovation in available Iranian and

foreign literature. The results of this study can expand the theoretical foundation of papers related to behavioral finance and information presentation format in financial reporting. Secondly, this study's results will show how the information present format affects the JDM quality of investors with different EI, self-confidence, risk-taking, and strategic thinking. The present paper is the first study that brings innovation by simultaneous examination of the impact of information presentation format and mentioned personal characteristics on JDM quality within a single model. Therefore, the main problem of this study is to find whether the information presentation format moderates the relationship between personal and psychological factors (EI, self-confidence, risk-taking, strategic thinking) and its effect on investment's JDM.

2-Theoretical foundations and research background

1-2- Theoretical foundations

Investor's decisions and EI

Investors deal with various factors when making investment decisions. Financial reports, firm performance, portfolio records, and economic and financial conditions are all factors influencing investors' decisions (Riri, Manurang, and Kartika 2020). According to economic theories, people are rational players and investors behave rationally in their financial decisions (Sashikala and Chitramani 2017). However, behavioral-financial studies show that people do not show rational behaviors as economies expect so their decisions are influenced by the effect of psychological feelings (Bakar and Yi 2016). Investors' behavior is a major part of decisions made by investors, and their decisions become more complicated due to emotions, mental mistakes, and personal characteristics (Alwahaibi 2019). Therefore, decision-making can be considered a complex process that requires analyzing the financial and non-financial data, which needs experience and knowledge in fundamental and technical analyses (Afriany, B, and Herdiany 2023).

Personality factors are psychological variables that affect human behavior. Personality traits play a vital role in the decision-making process, influence logic, and deviate the investor's decisions from the existing truths (Vanderpal 2021). EI is a psychological factor and personal trait that affects the investor's behavior.

Goleman (2006) defines emotional intelligence as a constraint for perceiving emotions of oneself and others, inspiring oneself, and good surveillance over emotions of self and others. According to Goleman, emotional intelligence helps financial experts make better decisions. Two approaches have been studied in terms of EI. The first approach considers EI a set of characteristics and competencies, which make up a personality, while the second approach considers the EI's potential. However, the main model of EI was introduced by Mayer and Salovey (1997) who consider EI a set of abilities related to perceiving emotions in oneself and others (perceiving emotions), understanding how to create, develop, and interpreting emotions (understanding emotions), using this understanding to strengthen thinking in behavior (facilitating emotions), and better management of emotions of one own and others (managing emotions) (Nicolet- dit-Félix et al. 2023). Studies show that EI helps people to manage and monitor their emotions and assess the emotional status of others leading to better decisions (Sashikala and Chitramani 2017). When investors face uncertain conditions due to information shortage or lack of knowledge about the competitive environment, they cannot do the right calculations, so deal with emotions and try to adopt better decisions by analyzing and evaluating emotional moods and managing their EI. Robalti et al. (2015) found that EI could encourage investors with a certain implication for investor behavior. Oakes et al. (2009) confirmed the significant relationship between EI and investors' behaviors. On the other hand, the results of studies conducted on EI show the importance of the individual part of EI as a potential for controlling emotions, self-confidence, risk-taking, and thoughtful guidance. For instance, Rowan Barr-Oun (2002) introduced an aware mind resisting stress and high self-confidence as EI specifications (Upadhyay et al. 2020). People with high EI accept stressful events as a challenge instead of a threat, so they perceive less stress and risk and show a more risk-taking demeanor. Individuals who rely on their EIs have better financial preferences; therefore, EI enhances judgment decision-making (JDM) quality. Moreover, individuals with high EI have successful social relationships and self-confidence (Aren and Hamamci 2022). The definition presented by Salovey and Mayer implies the impact of EI on the thinking type. In 1990, they introduced EI a potential for managing the emotions of oneself and

others that directs thoughts and movements. Brook et al. (2017) expressed that strategic thinking is voluntary, system-oriented, guiding, and opportunistic thinking that directs individuals and organizations toward discoveries and ideal strategies (Sadeghi and Ghasemi 2021). Nekoueezadeh et al. (2014) studied the relationship between strategic thinking and EI in the Gas Company of Ilam Province and found a positive and significant relationship between these two variables. According to the available literature, as a personal trait, EI has a positive relationship with decision-making quality, as well as the psychological factors of self-confidence, risk-taking, and strategic thinking.

Self-confidence can be defined as a positive emotion of a person about a decision or mental belief in the occurrence of a positive outcome developed due to self-confidence and positive decisions and beliefs. Knutson (2011) found that investors with positive effects such as emotion and self-confidence and look for high-risk investment options, while investors with negative effects are worried and prefer to invest in low-risk choices (Baruah and Parikh 2018). Cupák et al. (2020) concluded that financial literacy and confidence in financial knowledge are related to economic conditions with probable investment in stock. Riri et al. (2020) confirmed that overconfidence had a positive and significant effect on investment decisions. Bakar and Yi (2016) found that overconfidence, conservatism, and availability bias have considerable effects on investment decisions. Yao and Rabbani (2021) concluded that self-confidence has led to unwillingness for doing financial signals and ignoring the important signals in financial decision-making (Aren and Hamamci 2022).

The concept of uncertainty in financial demeanor is mainly considered as a risk, and uncertainty is defined as estimation error, inability to forecast results, and disturbance in the market (Lashgari 2015). Individuals' attitude toward risk has various dimensions depending on personality traits and psychological biases, so it can be stated that investment strategies adopted by individuals are determined based on the personality traits and risk tolerance of investors. Therefore, investors can achieve an important advantage in the financial competitive markets by knowing their personalities and risk-taking rates (Kubilay and Bayrakdaroglu 2016). Individuals with high risk-taking levels are willing to invest in

stocks and derivatives, while individuals with low risk-taking levels are willing to invest in securities and bank deposits (Aren and Nayman Hamamci 2020). Strategic thinking is another factor that significantly influences decision-making. Thinking style is a subjective pattern that explains what kind of data people collect, how to process this data, and how to use them to make decisions (Bayazi, Kordnaji, Hosseini, and Danaeefard, 2019). Harvard (1989) defines strategic thinking as the ability to consider the long-term consequences of current measures, the tendency to sacrifice short-term benefits to achieve long-term benefits, and the ability to control. Takur and Calinjou explain that strategic thinking includes some specifications, such as being proactive, risk-taking, and a center for control and communications (Farhangi and Dehghan 2010). Jashni (2014) and Zahrabi (2019) state that managers' role in strategic process and decision-making depends on their thinking methods and planned frameworks just raise some questions that their answers are based on the methodology of managers and their thoughts in the decision-making process (Sadeghi and Ghasemi 2021).

Information presentation format and judgment decision-making quality

Information presentation format means the method through which, information is provided for the person who makes decisions in accounting or other fields. Because accounting reports can be given to users in different forms, it can be claimed that information presentation format affects judgment and decision quality in two ways. First, the information presentation format affects the mental representation of information processing by the decision maker. Second, this format indirectly affects the decision-making results by affecting the specific characteristics of the decision-maker (Kelton, Pennington, and Tuttle 2010). Since no single theory exists about how information presentation format influences judgment decision-making (JDM) quality, the results of relevant studies have been reviewed herein.

Visualization: visualization is defined as a visual representation of information or concepts designed to make effective relationships with the content or message, and improve understanding in the audience. This type of information representation can manifest in a wide range of images, including quantitative, qualitative graphs, and artistic images (Eberhard

2023). Visualization effects within visual graphical signs or imageries can facilitate information processing by users. The relevant studies are derived from two information science and cognitive psychology contexts. Information science studies on the effective identification in comparison between tables and simple diagrams go back to one century ago, while newer studies address the visualization of advanced data by computer interfaces to facilitate computations. Psychological studies indicate that visual information is inherently richer than verbal and symbolic information improving problem understanding and accuracy in judgment and decision-making. Dhal and Teegarden (1999) found that 3-D images could improve forecast accuracy in financial reports, while other researchers such as Rebotier et al. (2003) indicated that visual signs could not improve judgment accuracy in image processing compared to verbal signs. Evidence indicates that graphs lead to faster processing, learning, and decision-making. Reani et al. (2019) point out that different types of graphs lead to various attitudes among users, and those graphs with optimal design cause more efficient and faster views. Parvet et al. also confirmed this subject indicating that verbal information leads to a better understanding of graphs. Findings obtained by researchers imply the impact of self-confidence and risk on the visualization of information. Yildiz and Bohm (2017) concluded that a graphical model of security decision-making improves risk perception compared to a textual description. Dambacher et al. (2016) observed the impact of visualization on risk attitude and found that highlighted graphs increased risk aversion. Similarly, Diaco and Haseldin (2007) concluded that diverse financial graphs could change the risk perception of investors. Andrade (2011) found that respondents had overconfidence in visualization-based estimates causing bias in decision-making. Similarly, Dang and Hayes (2012) indicated that a visual decision that illustrates uncertainty in engineering design leads to less confidence in decision-making compared to traditional methods that remove uncertainty (Almilia, Dewi, and Wulanditya 2019).

Order of information presentation: Elvia and Solistivan (2010) introduce the impact of the order of information as one of the reasons causing exploratory bias, so investors do not judge based on the content of information but decide based on the order of received

information. When investors evaluate the evidence and information with negative to positive information direction or vice versa, exploratory bias occurs in their judgments due to limited rationality in decision-making. People tend to bias when evaluating information in the stock market based on a specific order. When the information direction is from positive to negative one, their evaluation is descending, and when the order of information is from negative to positive then individuals are more willing to do the evaluation. This indicates that individuals are vulnerable to the impact of the order of information, especially when they receive the last information. On the other hand, findings indicate that when individuals with evaluation of short-term information make investment decisions, they are more influenced by the order of information becoming sensitive to newer information (Aprayuda, Misra, and Kartika 2021).

Selective attention: additional information disclosure with limited time in information processing leads to biased selective attention. Selective attention is the key factor in causing errors in the coding process of personal information and is related to the bounded rationality theory. It is not possible to achieve the maximum rate in the decision-making process since all possible alternatives cannot be confirmed, and this constraint can affect the allocation of cognitive resources of investors leading to selective attention to specific information particularly accounting information presented in financial statements. The salience effect is an important cognitive mechanism that facilitates the learning process by focusing individuals' limited attention on the most relevant cases. According to available evidence, the information expressed in different degrees can affect the attention location of users of accounting information, which involves various financial reporting formats. Research indicates that companies use the importance of selective disclosure of information to distort user perceptions of information about the company's actual performance. For example, management can use improper formats or well-designed graphics to cover the individuals' judgment (Rosdini et al. 2020). The limited time for information processing in the decision-making process causes another factor called cognitive overload. Cognitive overload occurs when limited information processing imposes overload or effort on the memory and limited memory capacity affects the information processing.

Cognitive effort disturbs the ability of people to obtain and process information causing negative effects, such as direction bias, less learning, and error in problem-solving (Kelton and Pennington 2012). Allen et al. (2014) manipulate cognitive load as a dependent variable to show that judgment accuracy and speed are reduced when visualization is used under the higher cognitive load. Ajey (2014) addressed this relationship for financial data but found no effect on visualization on cognitive effort or judgment quality (Eberhard 2023).

Previous studies show that online information is one of the information presentation formats causing cognitive effort. Hyperlinks used in information acquisition led to cognitive effort compared to text processing. Instead, information acquired from links allows users to have more control over information search processes improving learning and reducing the time to find information (Kelton and Pennington 2012). Sheng Bi (2017) investigated the influence of online information on the JDM quality and concluded that high-quality electronic signals had considerable positive effects on investing decisions. The number of words in the introduction, loner videos, and more likes makes investors consider a project with high quality (Bi, Liu, and Usman 2017). On the other hand, process complexity affects the accuracy and confidence degree of the decision. When the task is simple, decision-makers have sufficient cognitive sources to solve problems and make more right decisions (Almilia, Dewi, and Wulanditya 2019). The effectiveness of a presentation format depends on the task features. If the presentation format is not matched with task requirements, one must increase the cognitive effort, which leads to lower JDM quality. However, the cognitive fit between the presentation format and the task would result in faster and more precise performance. Vessy and Galetta (1991) concluded that graphical presentation formats are more efficient than tabular presentation in the evaluation of the relationship between data and MBA students because MBA students use more efficient and precise tables when doing an unconventional task (Kelton and Pennington 2012).

According to the importance of the influence of psychological and personal factors of EI, self-confidence, risk-taking, and strategic thinking on the JDM quality of investors, the influence of information presentation format on the JDM quality and research

gap in the impact of information presentation format on the relationship between mentioned psychological factors and JDM quality, this study aims to add knowledge to previously studied by examining the mediating role of information presentation format on the relationship between psychobiological factors and JDM quality.

2-2- research background

Ghadrdan et al. (2021) conducted a study under the title of "The effect of financial information on investor decisions: accrual versus cash accounting" to analyze the value-added information developed following the two main accounting systems for decision-making. The data were collected through 170 Iranian companies listed on Tehran Stock Exchange between 2009 and 2015. The results indicate that the information obtained from accrual accounting and cash items had an impact on the stock prices, and the information obtained from accrual accounting had less effect on the valuation of stock prices compared to the value of information obtained from cash accounting.

Fani (2021) conducted a study under the title of "the impact of business intelligence on the decision-making quality of Entrepreneurs with the mediating variables of information quality, data quality, and Innovation" to investigate the effect of the mediating role of information quality in the impact of business intelligence on the decision-making quality of entrepreneurs. The statistical sample comprised 285 entrepreneurs working in the Chamber of Commerce of Mazandaran Province, and data analysis was done through variance-based structural equations modeling using MPLUS software. the results indicated a positive and significant effect between business intelligence, data quality, and innovation on the decision-making quality of entrepreneurs. Moreover, information quality, data quality, and innovation had a partially mediate role between two variables of business intelligence and the decision-making quality of entrepreneurs.

Arif Widyatama and Narsa (2023) carried out a study under the title of "The use of visual presentations for integrated reports in the investment decision-making process" to examine the impact of information presentation format on the decision-making process of unprofessional investors in Indonesia. In this research, the firm performance report was divided into two visual and descriptive

formats and given to 89 students. The research results indicate that information presentation in visual format has more impact on investment allocation decisions in Indonesia and integrated reports are more effective rather than unintegrated reports.

Susanto et al. (2022) carried out a study entitled "Gender differences, framing, and responsibility in investment decision-making: an experimental study" to examine the risk-taking level among men and women particularly in information processing within investment decisions based on the framing and responsibility distinction. The results indicated that positive and negative framing and responsibility levels could affect investor decisions. Moreover, this study revealed the positive and negative framings and the impact of responsibility levels on investor decisions. This research also uncovered the differences in risk preferences between men and women, and both genders had different preferences in similar decisions.

Aprayuda et al. (2021) carried out a study under the title of "Does the order of information affect investors' investment decisions?" to investigate the effect of the order of information presented on the belief adjustment model on investors' decisions. Findings indicated a difference in valuation between investors who accepted positive-to-negative and negative-to-positive information sequences. Those investors who are influenced by the order of information when evaluating information do more evaluations on newer information and their decisions are affected by the next information indicating that investors are influenced by the order effect and only concentrate on newer information.

Hypotheses

The reviewed foundations and literature made the base for hypotheses designed in this study as follows:

Hypothesis 1: information presentation format moderates the impact of EI on self-confidence.

Hypothesis 2: information presentation format moderates the impact of EI on risk-taking.

Hypothesis 3: information presentation format moderates the impact of EI on JDM quality.

Hypothesis 4: information presentation format moderates the impact of EI on strategic thinking.

Hypothesis 5: information presentation format moderates the impact of self-confidence on JDM quality.

Hypothesis 6: information presentation format moderates the impact of risk-taking on JDM quality.
 Hypothesis 7: information presentation format moderates the impact of strategic thinking on JDM quality.

Conceptual model

The conceptual model of the study was designed as shown in Figure 1 based on the presented theoretical foundations, literature, and hypotheses.

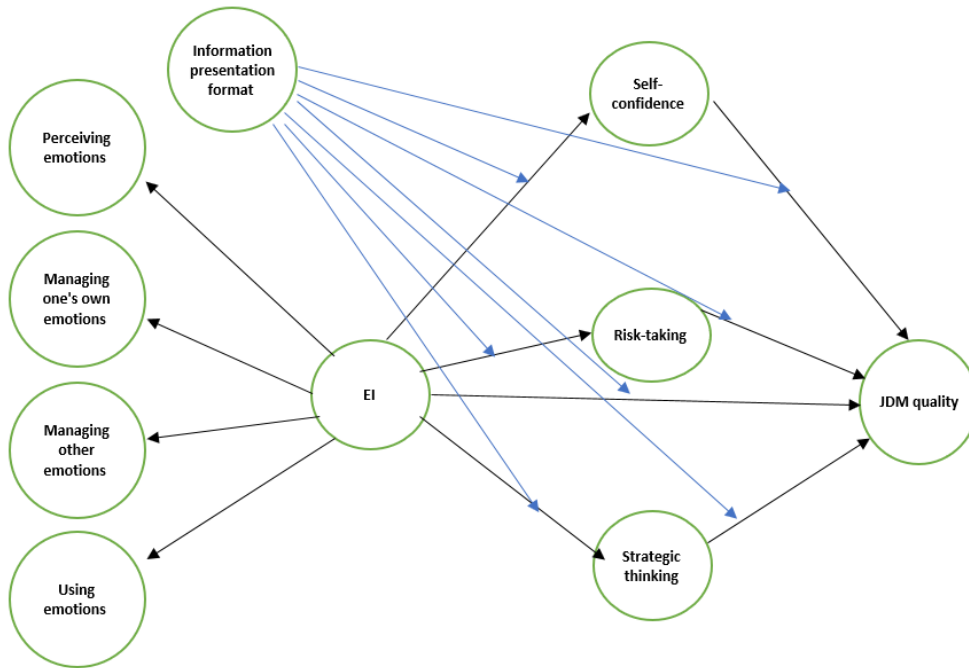


Figure 1. Conceptual model of study

Methodology

Method: the method of this study is analytical-correlational in terms of objective and is quantitative-applied in terms of implementation process and result.

Statistical population and sample: statistical population of the study comprises the investors who have stock codes in Tehran Stock Exchange. The statistical sample was measured using a sample size calculator based on the SEM, and 366 investors who had stock codes were selected. Following the research problem and approach ruling it, the sampling method was systematic probability. To measure the sample size, in the sample size calculator, this impact factor equaled 0.19, test power equaled 80%, five latent variables existed and the number of observed variables that are items of the questionnaire equaled 33, and at the last step and type I error to achieve confidence range of 0.99 equaled 0.1 as described below.

Anticipated effect size: ?

Desired statistical power level: ?

Number of latent variables: ?

Number of observed variables: ?

Probability level: ?

Calculate!

Minimum sample size to detect effect: 540

Minimum sample size for model structure: 308

Recommended minimum sample size: 540

Data collecting tool: library method and recent papers were used to formulate the theoretical foundations and research background. In the second section, data related to independent and dependent variables were collected through standard questionnaires. The variable of EI that included four dimensions (perceiving emotions, managing one's own emotions, managing others' emotions, and using emotions) with 16 items, self-confidence with 2 items, risk-taking with 5 items, strategic thinking with 4 items, and JDM quality with 6 items were assessed using 5-point Likert scale. Table 1 reports references and information related to the questionnaire based on the conceptual model of the study. To collect data in information presentation format, financial statements of a sample firm and other technical information that investors

need to forecast stock prices for judgment and decision-making were given to investors as a questionnaire and in two different formats (standard reports of financial statements and a second scenario in which information are presented as summarized texts and transcripts). Therefore, investors can predict the stock price changes in both scenarios. After individuals judged and made decisions about ascending or descending trend of the stock price of the sample firm, this judgment or decision-making is compared with the real stock price of the sample firm. The response of individuals to ascending or descending trend of the stock price is used as a binary variable through which, the variable takes 1 when descending trend is selected and takes 2 when ascending trend is chosen.

Table 1. Questions related to latent variables in the questionnaire and model

Latent variables	Manifest variables		Reference
EI	PQ1-PQ4	Perceiving emotions	Aydemir& Aren2017
	MS1-MS4	Managing one's own emotions	
	MQ1-Mq4	Managing others' emotions	
	U1-U4	Using emotions	
Self-confidence	SELF1-SELF2		Craig E 2006
Risk	RISK1-RISK5		Westaby, J. D., & Lowe,J.K. (2005)
Strategic thinking	ST1-ST4		Moon, B.J. 2013
JDM quality	QU1-QU6		Ghasemaghaei, M., 2018

Testing hypotheses: according to the conceptual model in which constructs of EI (including dimensions of perceiving emotions, managing one's own emotions, managing others' emotions, and using emotions), self-confidence, risk-taking, and strategic thinking affect the judgment decision-making quality, this model has a causal pattern. Hence, SEM was used for analyzing the collected data regarding the causal model of relationships in the research model. On the other hand, and according to the sample size obtained from software, the sample size was measured for SEM and its comparison based on the Hensler's thumb method in the presence of 33 items using covariance-based software, which required a sample size above 300 observations (comparison rule with thumb method in pragmatic research book by Moradi & Miralmasi, 2010). Finally, the relative complexity of the model resulting from the dimensional exogenous construct and moderator variable makes the researcher use partial least squares (PLS) approach (variance-based)

as the second generation (leading generation) instead of using variance-based SEM despite the normal distribution of data (Moradi & Kheyri, 2016). Moreover, the collected data were analyzed through SMARTPLS-4 software.

Descriptive statistics: according to frequency observed in sample size, 75.4% of respondents were men and 24.6% were women of which, 41.85 had BA degrees, 42.45 had BA degrees, 12.9% had Ph.D., while 2.4% and 0.6% had associate degrees and diploma, respectively. Moreover, 58.2% graduated in non-financial disciplines, 12.8% had accounting education, 7.9% had financial management education, and 9% graduated in management accounting and audit disciplines; 45.9% have invested in stock market more than 5 years, 25.3% had investment duration of 4-5 years, 8.8% had 3-4 years of investment, 1.6% and 9.4% had 2-3 years and less than one year experience of investment in stock market, respectively.

Assessing normal distribution of data: skewness and kurtosis indicators were used to assess the normal distribution of data. All skewness and kurtosis coefficients were in the determined range (skewness index between ± 3 and kurtosis index between ± 5). Therefore, the necessary and sufficient assumption exists for the normal distribution of data.

Hypotheses testing: to test research hypotheses, the external model was used in the absence of moderator variable of information presentation format to evaluate the homogeneity of reflective items of each component, evaluate the validity and reliability of the construct, and assess the measurement quality of latent variables. In the next step, the moderating effect of the information presentation format was assessed by running the model in the presence of this variable.

In a reflective model, observable variables of that external model must be one-dimensional and homogenous. Accordingly, values of load factor obtained from reflective external model, all load factors must be greater than 0.7. According to the load factor values obtained from the reflective measurement model, questions related to components with load factors less than 0.7 are removed from the model. Regarding the values obtained from components with reflective indicators of MS4 questions about managing one's own emotion belonging to the latent variable of EI and RISK1 question of the latent variable of risk-taking were deleted. If these questions would not be deleted, the divergent and convergent validity of the model would be questionable.

Examining model reliability: internal reliability indicates the rate of correlation between one variable (component) and its relevant indicators. Four indicators or criteria of Cronbach's alpha, composite reliability or p-Delvin-Goldstein, RHO_A reliability or Spearman internal correlation of indicators, and shared reliability were used to test the reliability of the external model. As reported in Table 2, Cronbach's alpha values of all latent variables have observed the determined rate indicating appropriate internal reliability of indicators belonging to each variable of the model. The composite reliability rates of all constructs are greater than 0.7 indicating suitable internal reliability if research variables are in the model. Spearman correlation reliability coefficient is interpreted like the composite correlation or Delvin-Goldstein. As reported in Table 2, all variables in this

developed model indicate a good level of generalization of results of the factor analysis or external model of study reflecting the explanatory power of indicators based on their corresponding variables. The shared index's coefficient is used to measure shared reliability indicating the variance explanation share of each reflective index relative to its corresponding variables. According to Heyer et al., this index must be greater than 0.5. According to the coefficients reported in Table 2, the average shared index of all latent variables of this study was greater than 0.5. Therefore, shared reliability and other reliability coefficients, such as Cronbach's alpha, composite reliability, and RHO_A indicate that external model or reflective measurements had reliability. According to the results of four reliability tests, the reliability of causal research results is confirmed based on its model.

Convergent validity of model: Heyer et al. (2006) expressed two conditions to examine convergent validity, which is assessed in this study too. The first condition was $AVE > 0.5$ and the second condition was $CR > AVE$. As seen in Table 2, AVE values of all latent variables or components are greater than 0.5. This confirms the first condition of convergent validity of the model. On the other hand, the second condition of convergent validity indicates that the composite reliability coefficient must be greater than the average variance extracted, which is confirmed in this table.

Divergent validity of model: three main tests of transverse loads, Fronell-Larcker, and multitrait-multimethod were used to examine divergent or discriminant validity. Divergent validity is examined by using a factor-loading matrix. The correlation rate between each item and its corresponding variables is at least greater (0.1) than its correlation between that index with other variables indicating the appropriateness of divergent validity of external models. Fortunately, Fronell-Larcker results reported in Table 3 indicate that squired AVE of each variable is greater than its correlation with other variables, so the divergent validity between latent variables in this test is confirmed.

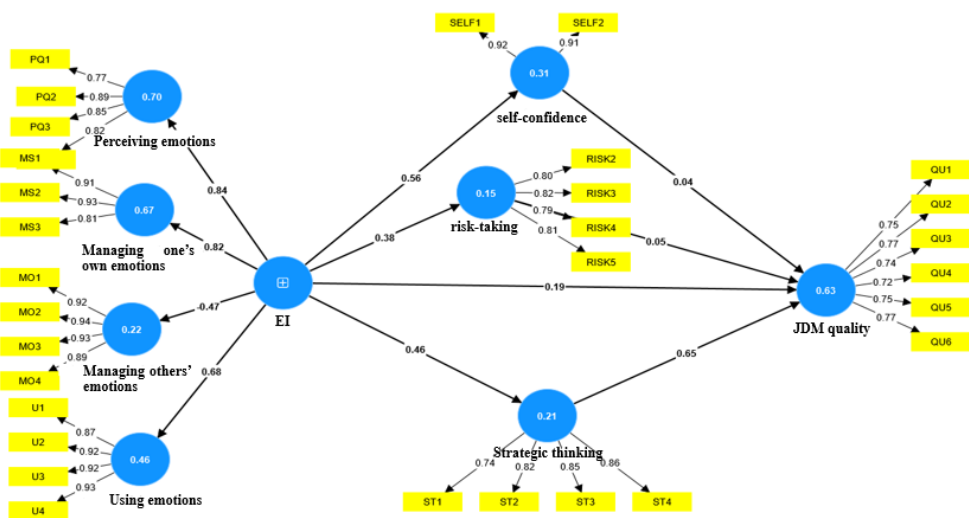


Figure 2. Modified external reflective model in standard coefficient estimation mode

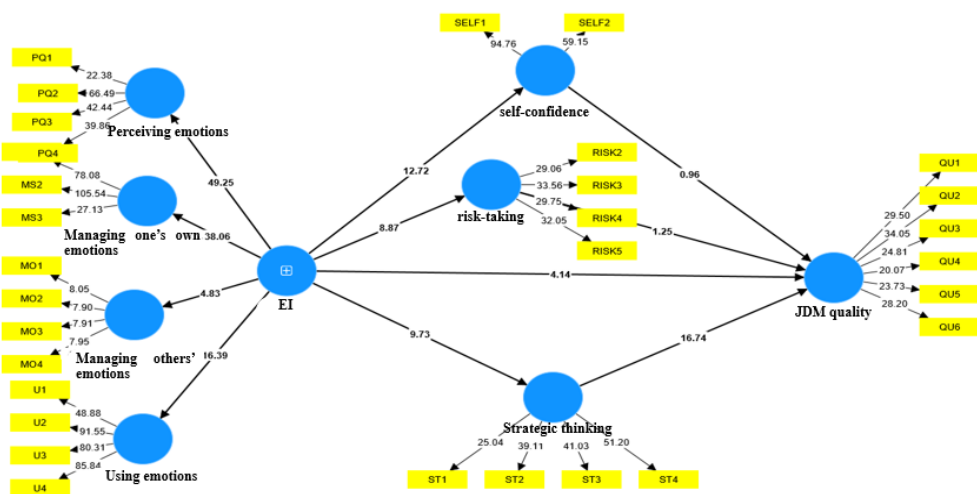


Figure 3. Modified external reflective model in coefficient significance mode

Table 2. Reliability test of external reflective model

Variables	Cronbach's alpha coefficient	Composite reliability coefficient	Spearman correlation reliability coefficient	Shared reliability coefficient
Using emotions	0.93	0.95	0.93	0.83
Self-confidence	0.81	0.91	0.81	0.84
Strategic thinking	0.83	0.89	0.84	0.67
Perceiving emotions	0.85	0.90	0.86	0.69
Risk-taking	0.82	0.88	0.82	0.65
Managing one's own emotions	0.86	0.91	0.87	0.78
Managing others' emotions	0.94	0.96	0.94	0.85
JDM quality	0.85	0.89	0.85	0.56

Table 3. Correlation between latent variables and squared AVE on the main diameter

	Using emotions	Self-confidence	Strategic thinking	Perceiving emotions	Risk-taking	Managing one's own emotions	Managing others' emotions	JDM quality
Using emotions	0.91							
Self-confidence	0.80	0.92						
Strategic thinking	0.52	0.48	0.82					
Perceiving emotions	0.34	0.26	0.30	0.83				
Risk-taking	0.26	0.24	0.19	0.35	0.80			
Managing one's own emotions	0.31	0.28	0.30	0.76	0.31	0.88		
Managing others' emotions	-0.06	-0.08	-0.06	-0.25	-0.15	-0.28	0.92	
JDM quality	0.55	0.47	0.77	0.39	0.25	0.36	-0.08	0.75

After testing the external reflective model, the quality of the model was tested. Researchers evaluate theories and practical connections between their analyses based on the power of their models in rejectable forecasts of new observations. The Q^2 value ≤ 0 indicates that the predictive power of PLS-SEM analysis for that index does not outperform even the simplest criterion (i.e.,

index of the tested sample). In the case of indicators with $Q^2 > 2$, researchers must compare RMSE or MAE with simple LM criterion in the next step. As seen in Table 4, the majority of indicators in PLS-SEM analysis have had lower forecast or prediction errors compared to LM, which indicates the average forecast power of these indicators.

Table 4. Cross validity of the shared index

	Q^2 predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
U1	0.30	0.58	0.45	0.00	0.00
U2	0.42	0.51	0.40	0.00	0.00
U3	0.40	0.53	0.42	0.00	0.00
U4	0.37	0.52	0.41	0.00	0.00
SELF1	0.29	0.57	0.44	0.42	0.29
SELF2	0.23	0.59	0.45	0.50	0.35
ST1	0.16	0.71	0.54	0.70	0.53
ST2	0.16	0.65	0.50	0.65	0.50
ST3	0.10	0.64	0.47	0.63	0.47
ST4	0.11	0.66	0.50	0.65	0.50
PQ1	0.35	0.66	0.51	0.00	0.00
PQ2	0.58	0.57	0.45	0.00	0.00
PQ3	0.49	0.63	0.49	0.00	0.00
PQ4	0.52	0.63	0.51	0.00	0.00
RISK2	0.07	0.95	0.80	0.97	0.81
RISK3	0.12	0.91	0.77	0.93	0.77
RISK4	0.08	0.95	0.78	0.98	0.79
RISK5	0.10	0.99	0.83	1.00	0.84
MS1	0.55	0.63	0.50	0.00	0.00
MS2	0.59	0.61	0.49	0.00	0.00
MS3	0.44	0.67	0.52	0.00	0.00
MO1	0.15	0.88	0.68	0.00	0.00
MO2	0.21	0.86	0.66	0.00	0.00
MO3	0.18	0.82	0.63	0.00	0.00
MO4	0.19	0.94	0.77	0.00	0.00

	Q ² predict	PLS-SEM_RMSE	PLS-SEM_MAE	LM_RMSE	LM_MAE
QU1	0.10	0.70	0.54	0.69	0.54
QU2	0.14	0.63	0.48	0.62	0.48
QU3	0.16	0.57	0.40	0.57	0.42
QU4	0.16	0.61	0.44	0.62	0.45
QU5	0.18	0.52	0.37	0.52	0.39
QU6	0.18	0.61	0.44	0.61	0.45

Analysis of moderator variable of information presentation format

To examine the moderating effect of information presentation format, the research model is implemented in the presence of this variable to assess

its moderating or adjustment role. Figures 4 and 5 show two modes of coefficient estimation and coefficients' significance, and Table 5 indicates the moderating role of this variable.

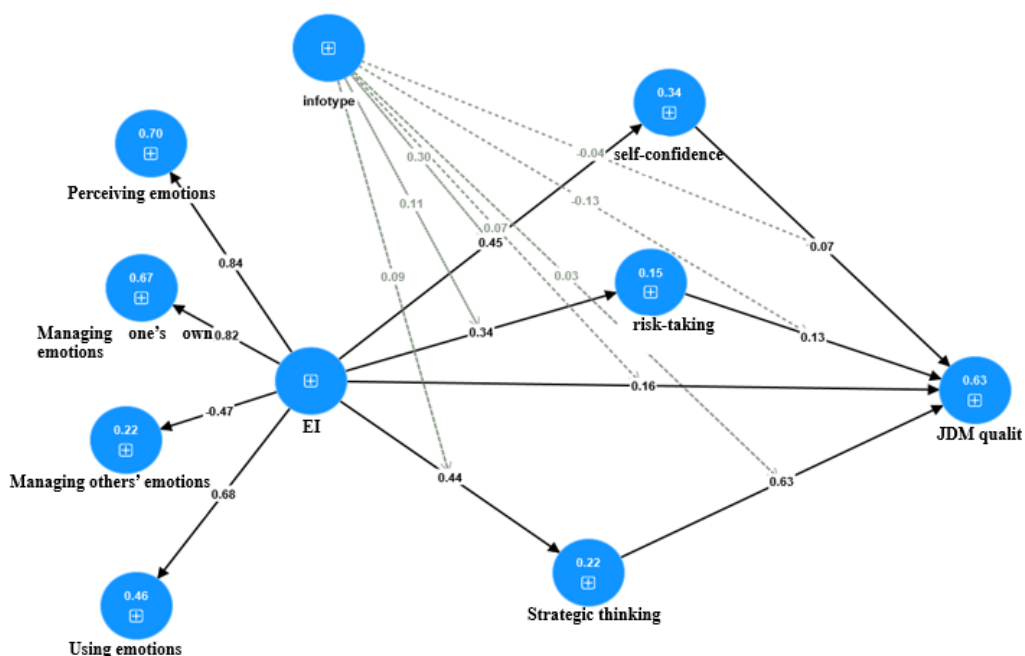


Figure 4. Moderating analysis of information presentation format in coefficient estimation mode

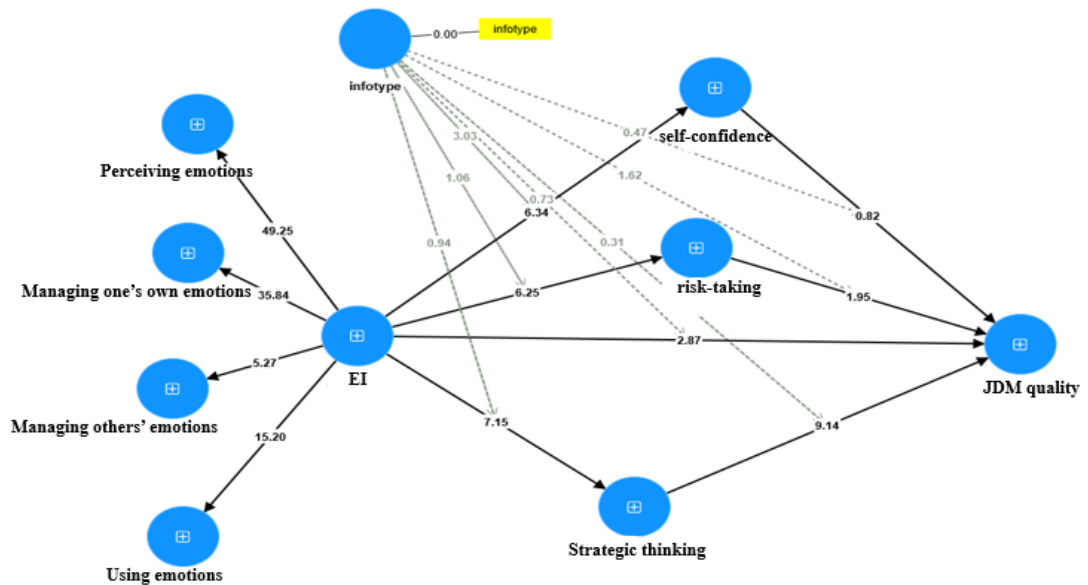


Figure 5. Moderating analysis of information presentation format in coefficient significance mode

Table 5. Results of moderator variable of information presentation format (IPF)

Row	Hypotheses	Path coefficients (Beta)	t-value	Result
1	IPF moderates the impact of EI on self-confidence	0.30	3.30	Statistically confirmed at the confidence level of 99%
2	IPF moderates the impact of EI on risk-taking	0.11	1.06	The insignificance of the moderator variable of IPF
3	IPF moderates the impact of EI on JDM quality	0.07	0.73	The insignificance of the moderator variable of IPF
4	IPF moderates the impact of EI on strategic thinking	0.09	0.064	The insignificance of the moderator variable of IPF
5	IPF moderates the impact of self-confidence on JDM quality	-0.04	0.47	The insignificance of the moderator variable of IPF
6	IPF moderates the impact of risk-taking on JDM quality	-0.13	1.62	The insignificance of the moderator variable of IPF
7	IPF moderates the impact of strategic thinking on JDM quality	0.31	0.03	The insignificance of the moderator variable of IPF

Results

The first hypothesis assessed moderating impact of IPF on the relationship between EI and self-confidence. The results of hypothesis analysis based on the path significance test, t-value (3.03), and path coefficient (0.30) reported in Table 5, the hypothesis is statistically significant at the confidence level of 99%. Therefore, IPF moderates or adjusts the impact of EI on self-confidence.

The second hypothesis investigated the moderating impact of IPF on the relationship between EI and risk-taking. The results of hypothesis analysis based on the

path significance test, t-value (1.96), and path coefficient (0.11) reported in Table 5, IPF was not significant. Therefore, IPF does not moderate the impact of EI on risk-taking.

The third hypothesis investigated the moderating impact of IPF on the relationship between EI and JDM quality. The results of hypothesis analysis based on the path significance test, t-value (0.73), and path coefficient (0.73) reported in Table 5, IPF was not significant. Therefore, IPF does not moderate the impact of EI on JDM quality.

The fourth hypothesis investigated the moderating impact of IPF on the relationship between EI and

strategic thinking. The results of hypothesis analysis based on the path significance test, t-value (0.94), and path coefficient (0.09) reported in Table 5, IPF was not significant. Therefore, IPF does not moderate the impact of EI on strategic thinking.

The fifth hypothesis investigated the moderating impact of IPF on the relationship between self-confidence and JDM quality. The results of hypothesis analysis based on the path significance test, t-value (0.47), and path coefficient (0.04) reported in Table 5, IPF was not significant. Therefore, IPF does not moderate the impact of self-confidence on JDM quality.

The sixth hypothesis investigated the moderating impact of IPF on the relationship between risk-taking and JDM quality. The results of hypothesis analysis based on the path significance test, t-value (1.62), and path coefficient (0.13) reported in Table 5, IPF was not

significant. Therefore, IPF does not moderate the impact of risk-taking on JDM quality.

The seventh hypothesis investigated the moderating impact of IPF on the relationship between strategic thinking and JDM quality. The results of hypothesis analysis based on the path significance test, t-value (0.31), and path coefficient (0.03) reported in Table 5, IPF was not significant. Therefore, IPF does not moderate the impact of strategic thinking on JDM quality.

According to Figures 4 and 5 and Table 5 indicating the statistical results of moderator variable of information presentation format, IPF only moderates the impact of EI on self-confidence, while does not have a significant moderating impact on other relationships. Now, its moderating rate and direction must be examined. According to Figure 6, IPF can strengthen the positive relationship between EI and self-confidence.

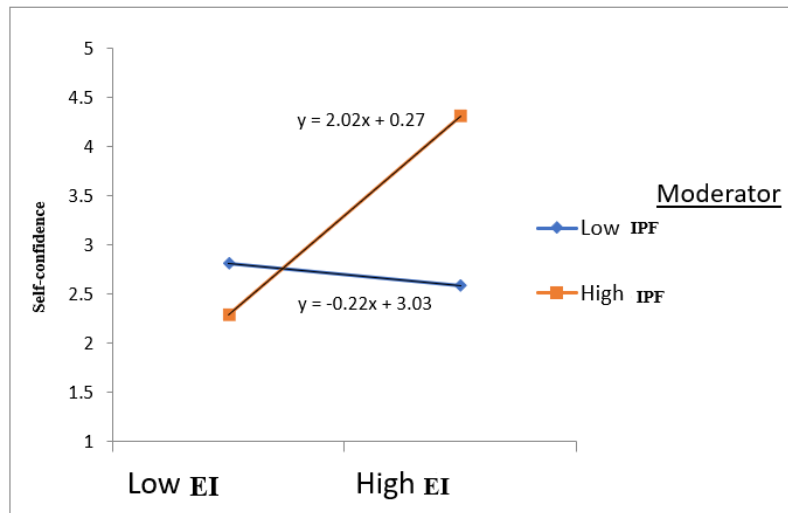


Figure 6. The moderating effect of IPF on the impact of EI on self-confidence

Discussion and Conclusion

The main purpose of this study is to examine the moderating role of information presentation format on the relationship between psychological and personal variables of emotional intelligence, self-confidence, risk-taking, and strategic thinking and its effect on the investing judgment decision-making quality. The research hypotheses were tested after the considered data were collected from a sample size of 366

investors who had stock codes, the conceptual model was proposed, and validity and reliability, and quality of the external model were ensured. Investor behavior is a functional discipline that is influenced by the economy, financial affairs, investment, and psychology. Investors aim to maximize profit and wealth, but their behaviors or demeanors are limited to certain anomalies. Personal factors, environmental variables, and judgment processes are factors

influencing investors' demeanors. The decision-making process is affected by different sensual and cognitive factors among individuals with different personality traits in terms of different EI, self-confidence, risk-taking, and strategic thinking. On the other hand, accounting information particularly the information contained in the financial statements, plays an important role in decisions made by users of this information. This importance results from annual reports and business activities depending on it. In the opinion of researchers, accounting information transfer in different audio, video, graphical, and other formats would result in different implications for users' judgment and decision-making.

Hypotheses 1-4 investigated the impact of information presentation format on the relationship between EI, risk-taking, JDM quality, and strategic thinking. According to presented theoretical foundations, EI is a set of abilities associated with detecting feelings, perception, and emotion facilitation that results in better decisions, while the individual aspect of EI has received attention as individual capacity in feelings control, self-confidence, risk-taking, and directing thought. Individuals with high EI accept stressful events as a challenge, not a threat, so they perceive less stress and risk and show more risk-taking behaviors. Those individuals who rely on their EI have better preferences, so this high EI enhances decision-making quality. Nekoueezadeh et al. confirmed the findings obtained by Salovey and Mayer (1990) who found a significant association between EI and strategic thinking. While studies indicate the effect of individual differences in information processing style and the impact of information processing style on the JDM quality, results of hypotheses 1-4 of this study confirm that information presentation format has no moderating impact on the variables mentioned in hypotheses except for hypothesis 1. In other words, the information presentation format moderates the relationships between independent and dependent variables only in the first hypothesis, which is the relationship between EI and self-confidence, while results of hypotheses 1, 2, and 3 show that the information presentation format has no impact on the nexus between EI on self-confidence, JDM quality, and strategic thinking. According to the proposed theoretical foundations, self-confidence, risk-taking, and strategic thinking are other psychological that

affect the JDM quality of investors. Investors who have positive emotions, such as excitement have higher self-confidence and look for high-risk investments, while investors with negative feelings are anxious and prefer to invest in low-risk choices. Moreover, the findings of researchers imply the impact of self-confidence and risk on information visualization. Yildiz and Bohm (2017) found that a graphical model of security decision-making improves risk perception compared to textual description, and Andrade (2011) concluded that respondents show higher self-confidence in visualization-based estimates, which causes bias in decision making but the results of hypotheses 5, 6, and 7 of this study showed that information presentation format could not moderate the relationships between self-confidence and JDM. Risk-taking and JDM, strategic thinking, and JDM, and this result is not matched with the findings of many available studies.

For instance, Rosdini et al. (2020) studied the impact of tabular information in JDM, Aprayuda (2021) examined effect of order of information on JDM, Susanto et al. (2023) and Fani (2021) investigated the effect of IPF on JDM, Dambarcher et al. (2016) assessed the effect on information visualization on the risk attitude, Andrade (2011), and Akif and Peet (1991) studied the impact of information visualization on self-confidence, Eiani et al. (2019) investigated the effect of different graphs on JDM, and found the significant impact of IPF on the JDM quality. The mismatch between the findings of the present study and other papers may raise from non-consideration of other factors affecting the JDM quality, such as gender, financial literacy, cultural features, and task complexity in this study. For example, Khosh Tinat believes that gender, financial literacy, and cultural features, as well as task complexity, engage in the effectiveness of information color in the JDM quality. Benabasad and Sanctis (1986), and Mackay and Villa Real (1987) introduced personal characteristics and information processing rate of decision makers as the reasons for the insignificant impact of IPF on the JDM quality. Therefore, it is concluded that personal and demographic factors, as well as cultural features, perform as factors mediating or adjusting the relationship between information and JDM quality, which can be a reason for the mismatch between the findings of the present paper and other studies. For

this purpose, this paper recommends further studies to examine the impact of gender, financial literacy, and cultural, social, and economic factors or ethnicity as moderating and intervening variables in the studies on these themes to find whether the mentioned factors can explain the contradictory results of this study. According to moderating impact of information presentation format on the relationship between emotional intelligence and self-confidence of investors, individual and group investors are recommended to make the required efforts to strengthen the mentioned factors to enhance EI skills and capabilities. Also, it is suggested to experts, brokers, and practitioners of the stock exchange, which is one of the substantial economic pillars of the country to examine the necessity of designing a plan to make investors aware of the effect of psychological behaviors on the judgment and decision-making quality, and prevent irreversible financial implications by making investors attending all training courses. Finally, it is suggested to standard setters and non-profit entities consider the results of this study in decisions made on how to present information of internal and external reporting to meet the management needs of the company and external users.

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