DETERMINANTS INFLUENCING INVESTMENT DECISIONS OF INDIVIDUAL INVESTORS: THE CASE OF THE DEVELOPING ECONOMY

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Abstract

In recent years, the Vietnam stock market has recorded a large number of new investors, of which individual investors account for the majority. Although it has increased both in the number of listed shares and in trading value, price fluctuations are very unpredictable over different periods, and awareness of factors influencing investment decisions is still limited, leading to a high risk of loss in investment activities (Mayfield et al., 2008). The research was carried out in order to point out the factors influencing investment decision-making among potential individual investors, thereby proposing solutions to improve investment efficiency. The study used data from 261 questionnaires with four hypotheses, using qualitative and quantitative research methods, Cronbach's alpha, exploratory factor analysis (EFA), and regression analysis by SPSS software. As a result, four elements influencing: 1) personality traits, 2) behavioral factors, 3) company-related factors, and 4) exogenous factors have a positive impact on the stock investment decisions of individual investors. Thereby the article shows solutions from the government, the stock market, businesses, and individuals to improve investment efficiency.

Keywords: Behavioral Factors, Company-Related Factors, Exogenous Factors, Investment Decisions, Personality Traits

Authors' individual contribution: Conceptualization — T.M.P.N. and T.M.A.N.; Methodology — M.D.T. and Q.L.L.; Validation — T.M.P.N. and T.M.A.N.; Writing — Review & Editing — T.M.P.N., T.M.A.N., M.D.T., Q.L.L., and D.N.N.; Visualization — T.M.P.N. and T.M.A.N.; Supervision — M.D.T. and Q.L.L.

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1. INTRODUCTION

The stock market is a market in which shares are bought and sold (Zuravicky, 2005). The stock market initially developed spontaneously and very primitively, out of a singular necessity from the beginning. Nowadays, together with the development of science and technology, the trading methods at the stock exchanges are also gradually improving in terms of speed and volume required to bring efficiency and quality to transactions. During the pandemic, stock exchanges have gradually used computers to transmit orders and switched from manual trading to fully using an electronic trading system.

Until now, stock exchanges have been established and distributed across all continents, including countries in Southeast Asia. It developed

in the 1960s–1970s in countries in Eastern Europe such as Poland, Hungary, the Czech Republic, Russia, and Asia such as China in the 1980s and early 1990s.

The Vietnam stock market has officially been in operation for nearly 26 years. During the development period of the Vietnam stock market, the market has experienced ups and downs, as shown by the volatility of the VN-Index. Until now, the Vietnam stock market has had two trading centers, the Hanoi Stock Exchange (HNX) and Ho Chi Minh Stock Exchange (HOSE), demonstrating its part as a crucial capital mobilization channel of the economy and ensuring the highest interests for investors and firms participating in the market.

Since the beginning of 2020, due to the impact of the COVID-19 pandemic, the scale of individual investors in the stock market has grown strongly. In fact, the more the pandemic broke out, the more money poured into stocks. In particular, the number of people opening accounts to invest in securities has reached 5% of the population, three years faster than the government's expected target. Cash flow also rushed into the market, with an average of 1 billion USD per session, which has never been achieved in the past 18 years. However, there are still many shortcomings related to the investments of individual investors. Specifically, entering April 2022, the stock market began to plummet and lost a strong point. The number of retail investors participating in the stock market in Vietnam has increased by nearly 70% in the past 12 months.

Most newcomers to the market tend to prefer to open a margin trading account in the hope of making quick profits. But the fact that investors are forced to sell stocks related to margin lending is putting heavy pressure on the market. The majority of investors only focus on short-term investments and are susceptible to the crowd effect. In addition, an economic expert mentioned two key factors that investors need to pay attention to: capital and learning from failures (Metawa et al., 2019). Besides the group of factors related to investors, the investment decisions of individual investors are also affected by the group of macroeconomic factors and the potential of investment securities (Che-Yahya et al., 2023). Therefore, there are many factors affecting the stock investment decisions of individual investors. This study aims to study the factors affecting individual investment decisions in the stock market. Through survey by questionnaire, data analysis using SPSS software to assess the influence of factors, thereby making some recommendations and solutions.

This study is built up in the following structure. Section 2 overviews/defines the studies of factors that individual investor might consider in investment decision-making and hypothesis development. Section 3 outlines/specifies the data sample collection and methodology investor within the performance of the research. Section 4 presents the results of the analysis. Section 5 sets out a conference of key results while Section 6 displays the main outcome and an indication of the study practice and suggestions.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Personality traits

Personality is described as "that pattern of characteristic thought, feelings, and behaviors that distinguishes one person from others and that persists over time and situations" (Phares, 1988, p. 4). To measure personality, many modern and traditional studies in psychology point to five basic dimensions of personality which is known as the five factors model (Costa & McCrae, 1992; Oshio et al., 2013) including openness, conscientiousness, extraversion, agreeableness, and neuroticism. Rizvi and Fatima (2015) suggested that the relationship between personality traits and stock investment by using online 100 investors. The paper makes an effort to rate investors' personality on parameters such as extraversion, agreeableness, conscientiousness, neuroticism, and openness. The study correlates investors' personality with stock market investment, type, objective, factors influencing the investments, etc. Enescu and Enescu (2009) showed that each investor has different personal characteristics and expectations, so they have different attitudes about financial risk and financial investment goals. Numerous studies' findings demonstrated that an individual's risk tolerance behaviors are influenced by their personal attributes, which in turn influence the way they make investment decisions (Krishnan & Beena, 2009; Pak & Mahmood, 2015). This points in the same direction suggested by Thuy and Ngoc (2021) that neuroticism, extraversion, and conscientiousness exert significant direct relationships, whereas agreeableness and openness to experience exert significant inverse relationships on risk aversion and risk aversion inversely influences short and long-term investment decisions.

Sadiq and Akhtar (2019) with an assorted sample of clients from various banks of Pakistan, the authors attempted to establish a relationship of investor's demographic traits and personality type with financial risk tolerance when making investment decisions. The study also revealed the link between investors' personality type and their levels of financial risk tolerance. According to the findings, investors with type A personalities take more financial risks than investors with type B personalities. Mayfield et al. (2008) carried out an analysis among business school undergraduates and pointed out that extroverts trade frequently and tend to invest their more money in the stock market and individuals with neurotic traits had a tendency to avoid short-term investing. Pak and Mahmood (2015) revealed that agreeable individuals rely on the financial analyst's judgment and feel difficult to make their own investment decision. Furthermore, openness in individuals promotes a greater willingness to make financial decisions (Nga & Ken Yien, 2013). The fifth element of the big five-factor model is conscientious investors who have no delusions and wisely make their investment decisions. This ability makes them more particular about the choice of investment and risk tolerance (Sadi et al., 2011). Youssef et al. (2021) showed that the impact of financial literacy on behavioral biases is stronger on females than males. From this point of view, compared to women, men are less

conservative and more engaged in trading securities. Implementing multiple regression analysis to test the influence of financial literacy on each category of the behavioral biases, in addition to test the effect of gender on that relationship leads to reach the following findings. In general, females showed more distinct types of behavioral biases than males, while males gravitated toward perseverance biases, females exhibited to information processing biases than other biases. Financial intermediacy and consultancy can become more efficient by comprehending individual investors' decision-making process.

2.2. Behavioral factors

Traditional theses of finance suggest that investors act sensibly in the stock market. However, behavioral finance studies demonstrate that investors do not act rationally, but their decisions are sometimes influenced by behavioral factors. There have been many domestic and international studies showing that psychological elements have a relationship and impact on individual stock market investors' decision-making. Pak and Mahmood (2015) also show that making decisions is negatively impacted by the risk aversion component, while the heuristics have a positive effect. Bakar and Yi (2016) suggest that availability, overconfidence, conservatism, and herding have an influence on investment decisions in descending order. Furthermore, they also depend on the individual's gender. In addition, overconfidence, conservatism, and availability bias have more substantial impacts other than herding behaviors on investor's decision-making. When considered in relation to the demographic characteristics of investors, Metawa et al. (2019) found that when investors have experience in the investment field, they tend to ignore the effects of investment, sentiment, overconfidence, overreaction, and under-reaction, and the herd behavior in investment decision-making. Pertiwi et al. (2019) stated that the higher tendency in risk-taking means the more frequent increase in trading and investors avoiding risks would perform less trading activities. Moreover, the willingness to invest in the stock market is reflected by risk-taking behavior in finance, of which, implied from multinominal logistic regression, overconfidence variation has only had a detrimental impact on trading activities. The higher investors' overconfidence level is, the lower trading activities they perform. Within the margin of this research, in correspondence with individual investors of security members in Surabaya, they are likely to perform trading activities in the 'moderate' category (at least once a month). In addition, investors having one to five years of experience were regarded as amateurs and as a result, did not usually perform trading activities.

Hesniati and Lasmiyanto (2020) argue that investors often prefer to invest in familiar investments. They can have accurately confidential source of information about how gold investment develops to be able to choose profitable investments. Therefore, asymmetric information and availability significantly influence investment decisions. That behavioral involvements such as information asymmetry and availability bias have a major impact on investment decision is reveal in several findings. For example, Gyanwali and Neupane (2021) suggest that overconfidence, herding, and loss aversion have a much greater influence on investment decision-making than other elements. From there, the author advises investors to have a suitable investment plan before listening to rumors to analyze and make the best decision. Fang et al. (2021) believe that the COVID-19 epidemic has created a feeling of fear and uncertainty for investors participating in the market. That's why the herding bias, the anchoring bias — is a form of misperception that causes people to focus on the first piece of available information (anchor) given to them when making a decision or situations that occur frequently during this time. These effects display a negative influence on investment decision-making. Phan and Zhou (2014) suggest that overconfidence, excessive optimism, and herding have a positive influence on investment decisions. They can also help investors feel more secure and proactive when looking at certain stocks and often lead to actual investment intentions or behavior; while increasing risk aversion will weaken investment intentions. However, Ton and Dao (2014) argue that overconfidence and herd behavior have a negative impact on long-term investment decisions; and risk aversion has a positive effect. Studies by Cao et al. (2020), and Phan (2020) also showed that there is an influence of psychological factors on investment decisions. These factors can be loss aversion, overconfidence, heuristics, representative bias, herding, anchoring, availability, etc. However, when researching new investors in the Vietnamese stock market, Nguyen et al. (2022) show that the factor of personal confidence affects their decisions. In this study, we have selected three behavioral factors, which include *anchoring*, *herding*, and *availability bias*, to consider their influence on investors' decisions.

Using the Google Search Volume Score (GSVS) as a measurement, the study of Che-Yahya et al. (2023) approximately evaluate the sentiment of individual investors, who mostly get Google to look up information, particularly about recently released equities. Besides, on the basis of ordinary least square regression (OLS) models, initial public offering (IPO) initial return and trading volume on the first trading day are significantly and favorably affected by pre-market investor sentiment, which is mostly concluded as a major factor influencing the initial return and trading volume of IPOs. It is implied in this research that investors should start collecting the Geoid Slope Validation Surveys (GSVS) data so as to assess the individual investors' sentiment before the market opens into account. Prior to the IPO, it was predicted that increased Google search for a company lead to the rise in investor interest, which increased investor interest in the IPO. Increased early returns and IPO trading volume are the results of these conditions.

2.3. Company-related factors

Nguyen and Nguyen (2013) identified financial factors affecting individual investor's decision-making in Ho Chi Minh (HCM) City such as earnings per share (EPS), and price/earnings (P/E). The major outcomes are that the dividend rate has the greatest influence on individual investment decisions, followed by earnings expectations, dividend policy, and par value shares. A study carried out by Mulyono et al. (2018) has determined the influence

of the company's performance on the stock price, as well as the influence on the stock investment decision through the return of total assets index and the size of the company. In 2021, Tarmidi (Faculty of Accounting, Mercu Buana University, Jakarta, Indonesia) conducted a study aimed at analyzing investment decisions using measures of company financial performance through EPS, return on assets (ROA), and debt equity ratio (DER) indexes.

Using 125 data samples of Indonesian manufacturing companies from 2014 to 2018, the study emphasized the investor's positive reaction to EPS and corporate size at year-end and positive reaction to ROA and DER at the publication date of the financial statement. Sukesti et al. (2021) studied the effect of debt equity ratio (DER), net profit margin (NPM), and size on stock prices with company performance as measured by return on assets (ROA) as a mediating variation. The findings demonstrated that whereas NPM had a substantial beneficial impact on both stock price and ROA, DER had a considerable negative impact on ROA. Therefore, the company's financial aspects, including DER, NPM, size, and ROA, are factors that investors consider while making investment choices.

2.4. Market factors

Market factors are researched by some domestic and foreign authors. Particularly, Waweru et al. (2008) demonstrate that market factors such as stock prices in the past, stock price changes, news from politics, and society have an impact on the decision of investing in stocks. To illustrate, Phung et al. (2022) pointed out that macroeconomic factors including interest rates and exchange rates will also affect investors. Moreover, Le and Nguyen (2011) showed that domestic and international economic growth, as well as the fluctuation of the world stock index, had the same effect. Vo (2015) indicated that financial ratios can be implemented as a precursor to financial distress since financial ratios are significantly correlated with the probability of firm financial distress. The conclusion from these above studies had some limitations because previous studies have only considered those factors in isolation such as personality traits, behavioral factors, company-related factors, and market factors. There has been no research paper that simultaneously evaluates the leverage of these factors on individual investment decisions. In addition, those studies have collected the data from varied geographic areas with the respondents collected with convenience sampling. The generalization of the findings needs to be scrutinized attentively, as they could only be, and were presented and analyzed in a practical way subject to collected data.

2.5. Hypotheses development

In this study, we first want to shed more light on the effects of the aforementioned factors, which include *personal traits*, *behavioral factors*, *company-related factors*, and *market factors*, on stock decision-making in the HNX. This comprehension may be especially useful in the case of individual investors, whose potential effects on the field of finance have not been adequately studied in previous literature.

Our study summarized a number of factors that affect the individual investment decisions on the HNX, influencing the use of factors, and developing research hypotheses to propose a research model with four official hypotheses, as follows:

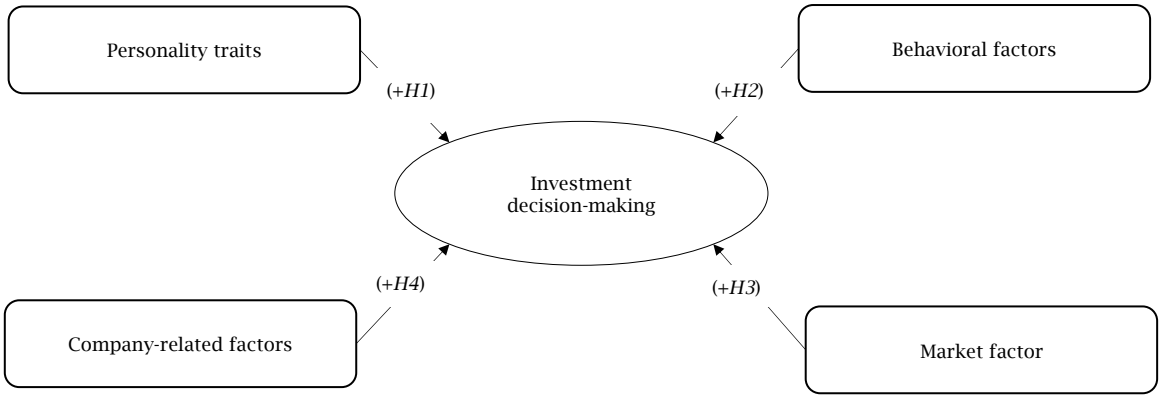
H1: Personality traits favorably affect investment decision-making.

H2: Behavioral factors affect investment decision-making.

H3: Company-related factors favorably affect investment decision-making.

H4: Market variable factors affect investment decision-making.

Figure 1. Research model proposed



3. THEORETICAL FRAMEWORK AND RESEARCH METHODOLOGY

3.1. Theoretical framework

Prospect theory: The foundation of prospect theory is that investors value expected loss to be greater than expected return. The theory also shows that a loss has a much more negative emotional impact than an equivalent gain. This theory gives us a deeper insight into human psychology when facing profit and loss as investors have to make decisions about whether to buy or sell different stocks every day. It also explains the psychology of "sell profit, keep loss" of almost investors in the market. In particular, when a stock price increases, they

often sell immediately to earn profits. However, when it falls, they hesitate to sell because suffering loss upsets investors. The feeling of loss is strong, and they expect the stock to rise again some days.

Heuristics theory: Investors use real experience and effort to make decisions. Nowadays, with more and more information spreading rapidly and rapidly, the lives of decision-makers who rely on financial markets are increasingly complex. Therefore, the use of heuristics is often an inevitable process to reduce the search for the necessary information, thereby providing a solution to a problem in the most efficient way. According to the heuristic method, investors may tend to make decisions based on information related to famous events, front-page news, or experiences gained in the past and recollections. The progress of selling or analyzing stocks is also referred to the initial purchase price. Investors often determine the range of stock prices or businesses' revenue based on past trends. This can lead to slow responses to unexpected changes.

Big five personality traits: The theory described the five broad personality traits namely: 1) extraversion, 2) agreeableness, 3) openness, 4) conscientiousness, and 5) neuroticism. Openness (also referred to as openness to experience) emphasizes that people tend to be more adventurous, creative and to have a broad range of interests. Conscientiousness is one defined by high levels of strong-willed, well-organized, and goal-directed behaviors. Extraversion is a personality trait characterized by sociability, optimism, and assertiveness. Agreeableness includes attributes such as trust, helpfulness, and cooperation. Neuroticism is a personality trait characterized by anxiety, insecurity, and emotional instability. Personality is a "motivator" of human behavior, namely individual investment intention; therefore, in this study individual's personality traits are considered as independent variables and their investment tendency is considered as a dependent variable.

Efficient market hypothesis: An efficient market is a market in which investors can use all available information to determine market prices, calculate corporate earnings, and diversify investment portfolios. Market efficiency consists of three different hypotheses depending on the degree of information reflection in security prices: 1) weak-form efficient market, 2) medium-form efficient market, and 3) strong-form efficient market. In an efficient market, all information in the market is subject to public scrutiny such as stock prices, yield rates, and trading volumes. Public information also combines all non-market information such as earnings and dividend announcements, P/E, EPS, P/B (price to book), stock splits, and key economic information treat. Changes in market information, fundamentals of the underlying stock, and stock price can normally lead to an over/under-reaction to the price change, which are empirically proved to have the significant on investors' decision-making behavior.

3.2. Research methodology

On the basis of the research overview and theoretical background, we gathered some factors that affect the stock investment decision-making of individual investors on the HNX. Our study used a combination of qualitative and quantitative research methods. In fact, research methods conducted interviews with 15 experts in the field of finance and securities. Following that, the group conducted analysis, synthesized comments and advice from experts, and formed factors affecting investment decision-making in stocks. The results of qualitative research are used to build scales, models and also serve as the foundation for building survey questionnaires in the research.

The quantitative research method uses survey questionnaires to test hypotheses and models about factors affecting the decision-making of individual securities investors on the HNX. The survey questionnaire for the study included two parts:

- *Part I:* Introduction to the topic;
- *Part II:* Questions related to the influencing factors of factors related to making investment decisions in securities of individual investors on the HNX. The questionnaire was built on validated scales from the results of previous studies, including 25 observation variables, accompanied by a five-point Likert scale (the degree is from one to five, clarifying between from — not totally agree to — fully agree).

The survey subjects were individual securities investors in Hanoi with 261 valid respondents, the survey time is in 2022. The researcher sent online questionnaires to individuals who have invested in the stock market and agreed to answer. The results were compiled, analyzed, and presented, by using SPSS software. After collecting data from the survey questionnaire, the research team will discard the unsatisfactory survey questionnaires, after that, perform data entry for analysis:

- *Step 1*: Test the scale by analyzing the reliability coefficient Cronbach's alpha;
- *Step 2:* Using exploratory factor analysis (EFA) method to narrow the scale;
- *Step 3:* Conduct regression analysis: Linear regression model aims to regress and predict the impact of the independent variable on the dependent variable.

Alternative methods in this research are presented as follows. Currently, the research is finding four factors: 1) *personality traits*, 2) *behavioral factors*, 3) *company-related factors*, and 4) *exogenous factors*, that affect individual investment decisions in the stock market after reviewing research from previous studies. However, it is possible to develop this research by adding one more factor that affects individual investment decisions in the stock market: *financial literacy*, which has been especially researched to such a degree: Guiso and Jappelli (2005), Campbell (2006), Graham et al. (2009) have shown that individuals lacking investment skills and financial knowledge will be less inclined to participate in the stock market than other people with a high level of financial education. The educational level is closely linked to the sources of seeking financial advice, and this advice is an input into the decision-making process, helping individuals make more effective investment decisions. Specifically, the authors point out that individuals with low financial literacy often seek financial advice from family and friends and are less likely to participate in the stock market. Meanwhile, Khan et al. (2021) believe that financial education level has a positive impact on investing in risky assets in the financial market such as stocks,

and bonds. This is because people with a high level of financial literacy are aware of the relationship between risk and return, face fewer barriers to entry in financial markets, and have less information asymmetry, along with are more qualified and more confident to invest in risky assets. In their study on the relationship between financial literacy and the financial decision-making of investors in the Pakistani stock market, Majeed et al. (2022) pointed out financial knowledge, financial skills, and financial attitude have a positive impact on investment decisions. Thus, the research method in this article can be replaced by adding one more influencing factor: *literacy*.

4. RESULTS

4.1. Cronbach's alpha test

Cronbach's alpha reliability coefficient method is implemented to assess the reliability of the scale of factors affecting the individual investment decisions on the HNX. The test was conducted on four scales with 25 observed variables, the standard to evaluate a scale that meets the standard is: in Cronbach's alpha analysis: $\alpha > 0.6$, the total variable correlation coefficient greater than 0.3 (Nunnally & Burnstein, 1994). Therefore, the scale has a Cronbach's alpha index: $\alpha \leq 0.6$ and the correlation of variables of the whole is less than 0.3 will be eliminated. The test results are presented in Table 1, 2, 3, and 4 as below.

4.1.1. Testing the reliability of Cronbach's alpha of personality traits

The personality traits scale is a scale that includes five observed variables (*PT1–PT5*) in Table 1. Cronbach's alpha coefficient of personality traits = 0.780 > 0.6. The observed variable *PT5* has the Cronbach's alpha coefficient if the variable is removed higher than the Cronbach's alpha coefficient of the whole group (0.805 > 0.780). However, its corrected item-total correlation coefficient is higher than 0.3, so it will still be kept for the next tests. The observed variables *PT1–PT4* have a high corrected item-total correlation coefficient, therefore, the individual personality factor scale has high reliability and is suitable for further analysis.

Table 1. Cronbach's alpha reliability of personality traits

Personality traits	*Code*	*Corrected item-total correlation*	*Cronbach's alpha if item deleted*
Cronbach's alpha coefficient = 0.780	*PT1*	0.533	0.747
	PT2	0.638	0.711
	PT3	0.688	0.691
	PT4	0.574	0.733
	PT5	0.378	0.805

Source: Authors' compilations.

4.1.2. Testing Cronbach's alpha reliability of behavioral factors

The behavioral factors scale includes eight observed variables (*BH1–BH8*) in Table 2. Cronbach's alpha coefficient for the behavioral factor is 0.811, which is greater than 0.6. The observed variables have a corrected item-total correlation coefficient > 0.3. Therefore, the behavioral factor scale has high reliability and is suitable for further analysis.

Table 2. Cronbach's alpha reliability of behavioral factors

Behavioral factors	*Code*	*Corrected item-total correlation*	*Cronbach's alpha if item deleted*
Cronbach's alpha coefficient = 0.811	*BH1*	0.470	0.799
	BH2	0.633	0.773
	BH3	0.389	0.809
	BH4	0.480	0.796
	BH5	0.555	0.785
	BH6	0.557	0.786
	BH7	0.527	0.790
	BH8	0.619	0.778

Source: Authors' compilations.

4.1.3. Testing Cronbach's alpha reliability of company-related factors

The scale of the company-related factors includes six observed variables (*CP1–CP6*) in Table 3. Cronbach's alpha coefficient of the company-related factors = 0.882 > 0.6. The observed variables have a high corrected item-total correlation coefficient. The business-related factor scale has high reliability and is suitable for subsequent tests.

Table 3. Cronbach's alpha reliability of company-related factors

Company-related factors	*Code*	*Corrected item-total correlation*	*Cronbach's alpha if item deleted*
Cronbach's alpha coefficient = 0.882	*CP1*	0.714	0.859
	CP2	0.776	0.849
	CP3	0.732	0.855
	CP4	0.658	0.868
	CP5	0.684	0.863
	CP6	0.595	0.878

Source: Authors' compilations.

4.1.4. Testing Cronbach's alpha reliability of market factors

The scale of factors related to the market includes six observed variables (*MK1–MK6*) in Table 4. Cronbach's alpha coefficient of factors related to the market = 0.856 > 0.6. The observed variables have a high corrected item-total correlation coefficient. The market-related factor scale is highly reliable and acceptable for further tests.

Table 4. Cronbach's alpha reliability of market factors

Market factors	*Code*	*Corrected item-total correlation*	*Cronbach's alpha if item deleted*
Cronbach's alpha coefficient = 0.856	*MK1*	0.661	0.829
	MK2	0.617	0.837
	MK3	0.681	0.824
	MK4	0.745	0.811
	MK5	0.667	0.827
	MK6	0.506	0.858

Source: Authors' compilations.

4.2. Exploratory factor analysis

The results after conducting exploratory factor analysis (EFA) on the independent variables showed that other discovered factors were predictive, but only 19/25 observed variables had factor loading coefficients greater than the allowable standard (> 0.5). Bartlett's test demonstrated that the Kaiser-Meyer-Olkin (KMO) coefficient is 0.872 > 0.5, showing that the factor analysis is appropriate. Bartlett's test has statistical significance at the 5% level of significance, showing that the observed variables are correlated with each other in the population. At the same time, factor loading coefficients of the factors are all greater than 0.5, illustrating the strong correlation between the elements. Four factors are drawn based on the standard Eigenvalue > 1, and these four factors explain 62.65% of the variation in the data (Table 5).

Table 5. Analyzing KMO coefficient and Bartlett's coefficient

Bartlett's test of sphericity			*Kaiser-Meyer-Olkin measure of sampling adequacy*
Approx. Chi-square	*df*	*Sig.*	
1,434.638	171	0.000	0.872

Source: Authors' compilations.

However, several measures of the same scale loaded with different factors show that some of the original statements do not have a significant relationship with them. Therefore, one new factor was discovered and less market factor, 19 observed variables were extracted into four groups of representative factors (Table 6), including:

- *Group 1*: Exogenous factors (EX) include variables: *MK4*, *MK3*, *MK5*, *MK1*, *MK2*, *CP2*, *CP1*;
- *Group 2*: Behavioral factors (BH) include variables: *BH5*, *BH7*, *BH2*, *BH8*, *BH1*, *BH6*;
- *Group 3*: Personality traits (PT) include variables: *PT2*, *PT3*, *PT1*, *PT4*;
- *Group 4*: Company-related factors (CP) include variables: *CP5*, *CP4*.

Table 6. Factor analysis (rotation matrix) for independent variables

Code	*Factors*			
	1	*2*	*3*	*4*
MK4	0.810			
MK3	0.780			
MK5	0.735			
MK1	0.724			
MK2	0.709			
CP2	0.634			
CP1	0.632			
BH5		0.725		
BH7		0.717		
BH2		0.702		
BH8		0.649		
BH1		0.606		
BH6		0.584		
PT2			0.823	
PT3			0.804	
PT1			0.714	
PT4			0.639	
CP5				0.769
CP4				0.726

Source: Authors' compilations.

4.3. Regression model analysis

After testing for reliability and validity, the linear regression model is used to test and perform data analysis of the hypotheses proposed in the literature review. Observed variables were grouped into *EX*, *BH*, *PT*, *CP,* and *investment decision-making* (*IDM)* dependent variables. The results of multiple linear regression analysis are as follows in Table 7:

Table 7. Testing the level of interpretation of the model

Model summary[b]					
Model	***R***	***R-square***	***Adjusted R-square***	***Std. Error***	***Durbin–Watson***
1	0.946[a]	0.894	0.892	0.195	1.679

Note: a. Predictors: (Constant), EX, BH, PT, CP; b. Dependent variable IDM.
Source: Authors' compilations.

To assess the relevance of the multiple linear regression model more closely, the authors used the coefficient of determination R^2 correction. The results showed that the corrected R^2 value was equal to 89.4%. That was the independent variable explains 89.4% of the variation of the dependent variable. In other words, the model explained 89.4% of the change in investment decision-making through four independent variables included in the model.

To test for autocorrelation in the residuals from this regression analysis, the authors used Durbin-Watson (DW) statistics. If the DW value is between 1.5 and 2.5, autocorrelation will not occur. We have Durbin-Watson = 1.679 — indicating zero autocorrelation (Table 8).

To test the appropriateness of the overall regression model, we considered the value F from the ANOVA variance analysis table, the value F = 327.939 with the significance level Sig. = 0.000 < 0.05, showing that the multiple linear regression model had been constructed in accordance with the overall (Table 8).

Table 8. Test the relevance of the model

ANOVA[a]						
Model		***Sum of squares***	***df***	***Mean square***	***F***	***Sig.***
1	Regression	49.958	4	12.489	327.939	0.000[b]
	Residual	5.903	155	0.038		
	Total	55.861	159			

Note: a. Dependent variable: IDM; b. Predictors: (Constant), EX, BH, PT, CP.
Source: Authors' compilations.

4.4. Linear regression results

The results of the linear regression analysis of the relationship between the factors affecting the investment decision-making in Table 9 indicate the relationship of four independent variables: 1) *exogenous factors* (*EX*), 2) *behavioral factors* (*BH*), 3) *personality traits* (*PT*), 4) *company-related factors* (*CP*) with the dependent variable investment decision-making. It is demonstrated that the aspects stated above influence investment decision-making, with the remainder attributable to the influence of factors other than the model.

Table 9. Test the relevance of the model

Model		***Unstandardized coefficients***		***Standardized coefficients***	***t***	***Sig.***	***Collinearity statistics***	
		B	***Std. Error***	***Beta***			***Tolerance***	***VIF***
1	(Constant)	0.176	0.096		1.821	0.070		
	EX	0.386	0.028	0.467	13.611	0.000	0.580	1.724
	BH	0.206	0.026	0.251	7.887	0.000	0.673	1.485
	PT	0.230	0.022	0.319	10.314	0.000	0.711	1.407
	CP	0.127	0.023	0.187	5.481	0.000	0.583	1.716

Source: Authors' compilations.

Test for multicollinearity: We test for multicollinearity among our independent variables using the Pearson correlation and the variance inflation factor (VIF). Table 9 reports value of VIF smaller than 2, indicating that the explanatory variables in our regression models have no multicollinearity.

The variable *EX* $\beta = 0.386 > 0$; statistic t corresponds to p-value = 0.000 < 0.05, so *the exogenous factor* is one of the factors that most strongly impact investment decision-making.

The variable *BH* $\beta = 0.206 > 0$, the corresponding statistic t has p-value = 0.000 <0.05, so the factor of *behavioral factors* in this study has a positive influence on the investment decision-making.

The variable *PT* $\beta = 0.230 > 0$, the corresponding statistic t has p-value = 0.000 < 0.05, so *personality traits* (*PT*) in this study significantly impact making investment decisions.

The variable *CP* $\beta = 0.127 > 0$, the corresponding statistic t has p-value = 0.000 < 0.05, so *company-related factor* (*PT*) in this study has a positive impact on making investment decisions.

Thus, the independent variables *EX*, *BH*, *PT*, and *CP* are linearly related to the *IDM* dependent variable and perfectly fit the model. From there, we have the regression equation with normalized beta coefficient as follows:

$$IDM = 0{,}176 + 0{,}386 * EX + 0{,}206 * BH + 0{,}230 * PT + 0{,}127 * CP \quad (1)$$

The normalized beta factor of 0.386 is the *EX* factor (*exogenous factors*) with the strongest impact on *IDM* (*investment decision-making*); the second strongest factor is the *PT* factor (*personality traits*), with a normalized beta factor of 0.230; the *BH* factor (*behavioral factors*) has the third strongest impact with a normalized beta factor of 0.206 and the *CP* factor (*company-related factor*) has an impact with a normalized beta factor of 0.127.

5. DISCUSSION

Research results show that four groups of factors: 1) "exogenous factors", 2) "behavioral factors", 3) "personality traits", and 4) "company-related factors" all have a positive impact on the stock investment decisions of individual investors. This means that all above factors should be considered before making an investment decision.

The results of the analysis show that personality traits have a significant positive effect on making investment decisions. Results revealed that the characteristics "extraversion", "agreeableness", "conscientious" and "openness" positively affect investment decision-making. These outcomes propose that individuals who are active, cooperative, broad-minded, determined, and well-organized also have financial goals and are more willing to invest. Beside this, the study proved that neuroticism does not positively impact an individual's attitude toward investment, for those who always feel anxious and insecure tend to assume that financial investments have hidden risks and therefore be afraid of losing money in trading.

The results also show that three behavioral factors, which are "anchoring", "availability bias" and "herding", have a positive influence on investment decisions. This means that investors often anchor their decisions to a certain milestone in the past or tend to add importance to more readily available information. In addition, individual investors often make investment decisions based on market trends. Rather than utilizing their knowledge to guide their choices, they merely adopt other investors' actions.

Regarding company-related factors, the outcomes of the statistical assessment indicated that the performing concept on the basis of the company's historical data measured through return on equity (ROE) has an effect on stock prices. Investors evaluate more at the numbers reported on the financial statements. NPM was proven to have a favorable impact on stock prices. The stock price is unaffected by the company's size. ROA can be a good mediator on the relationship between constructs and all research constructs are significant. Firm performance has a positive effect on stock prices. Investors are interested in purchasing stock from companies that are performing well. Therefore, to remain it shares attractive to investors the company needs to maintain firm performance.

Our research also reveals that exogenous influences have a significant impact on stock investment decisions. Indeed, macroeconomic information like interest rates, exchange rates, domestic and international economic growth significantly influence the decisions of investors. Moreover, the results show that the investors in need of buying stock are also very concerned about the company's EPS and designated employer representative. This means that they can be used as a benchmark in investment analysis and strategy. Furthermore, the signal of change in EPS can be seen from the reaction in stock prices that will make the market react positively. So that investors can use EPS as a consideration in determining the profit of an investment strategy.

Regarding contributions, the research paper is a scientific product that aims to identify and study the factors affecting stock investment decisions of individual investors on the Hanoi stock market. The authors have combined many theories in the research paper, such as prospect theory (loss aversion theory), heuristics theory, big five personality traits theory, and the efficient market hypothesis.

The study helps to identify and supplement factors affecting stock investment decisions of individual investors on the Hanoi stock market. Through qualitative and quantitative research methods, the study has built a model of influencing factors, measured their impact level, and explained the importance of those factors to the stock investment decisions of individual investors. Additionally, the authors used an integrated model combining personality traits, behavioral factors, company-related factors, and exogenous factors to understand the investment intention among individuals.

Therefore, the authors' research results will be a useful document for reference and research purposes when studying the investment decision-making of Vietnamese enterprises and individual investors. This paper can also serve as a basis for related research in the future.

6. CONCLUSION

From the excitement of the boom in scores and liquidity in the period of 2020–2022, investors in the stock market fell into a state of panic when market indices continuously declined in the face of fluctuations such as the Russia-Ukraine conflict, the trend of adjusting interest rate hikes to curb inflation of central banks, China continued to pursue a "Zero-COVID" policy, domestic events with cases and a series of policies to strengthen discipline in the stock market, bonds or the United States (US) Federal Reserve (FED) continuously raised interest rates to a large extent, the dense frequency in the past time has caused the USD to rise strongly compared to all other currencies in the market has put significant pressure on the macroeconomic balance of Vietnam.

In 2022, the stock market also witnessed a number of prominent cases of trading in corporate stocks and bonds (manipulated transactions, information hiding, and profiteering discovered), showing that the market still raised problems the 2023 market still has potential risks that new investors entering the stock market will face difficulties because of some of the following reasons: 1) the market has passed the most difficult time but the liquidity congestion has not been resolved when interest rate pressure is still high, investors will choose better channels from investment assets at fixed interest rates; 2) in the context of the Russia-Ukraine conflict, there are no signs of cooling down, gasoline prices and many goods escalate; 3) the US Federal Reserve (FED) will continue to increase interest rates, causing economic growth momentum and the stock market may not be able to flourish in 2023. Faced with that situation, this article studies the factors that affect individual investors' investment decisions and then makes recommendations for the government, businesses, and individuals to avoid risks when investing in

the market, the article provides recommendations and solutions for each participant of the stock market as follows:

For policymakers: In order to ensure a stable, sustainable, and transparent Vietnamese stock market, policymakers need to study and consider making more effective policies, creating conditions for individual investors to participate in the market.

Firstly, strengthening information, propaganda, accurate provision of guidelines and policies of the State and financial information of securities companies such as audit reports; ensuring large balances of the economy in order to create conditions for sustainable development, enhance transparency for the stock market and stabilize investor psychology.

Secondly, perfecting the legal framework, promoting the timely inspection, management and supervision of violations, correcting and strictly handling violations, especially false reporting acts, and at the same time completing sanctions for handling violations in the stock market to immediately overcome shortcomings and problems in legal documents in order to protect the legitimate rights and interests of investors.

Thirdly, it is necessary to ensure a safe and smooth operation of the trading system; invest in technological innovation and application of digital technology, and urgently implement necessary measures to upgrade the Vietnamese stock market from the marginal market to the emerging market to attract investment capital, especially foreign investment capital.

In addition, it is necessary to develop institutional investors, especially domestic institutional investors. Promoting organized investors will create momentum for the market, and strengthen governance because they have experience and investment strategies as well as a clear investment philosophy, helping the market stabilize and limit shocks.

For financial advisors and brokers: First of all, financial advisors and brokers can consider and consult with their own customers — individual investors about their personality, psychological behavior, level of understanding of the business as well as the market, their level of satisfaction with investment results as well as their choice and intention to invest in any stocks of individual investors. From there, the consultant can make predictions, recommend investments to customers, and advise them on the most appropriate direction as possible.

Moreover, financial experts or securities companies should have a mechanism to monitor the behavior causing fluctuations in the stock market to develop a business strategy as well as a strategy to provide services suitable for each type of investor.

For enterprises: Improving the quality of the group of factors related to the business, namely policies on dividends, and dividend rates as well as improving consumption indicators to evaluate the financial performance of the business. Currently, the majority of investors have basic knowledge related to finance. They can use some indicators to evaluate the financial situation and business performance of the company, thereby making their investment decisions. At the same time, according to the research results, the dividend rate factor also affects the decision-making of investors. The high dividend payout shows that the business is profitable and wants to share business results with shareholders. Therefore, enterprises should improve this factor while ensuring a reasonable financial structure for reproduction and business.

For individual investors: Firstly, it is necessary to be careful and thoroughly evaluate risks before making investment decisions. The unpredictable evolution of macro fluctuations in the rate of interest rate increase can cause the stock market to become unstable, potentially with many unfavorable factors. Unpredictable developments of macro fluctuations, such as the race to raise interest rates by the central banks of major countries to curb inflation or the general trend of downward adjustment after a period of hot growth, the risks of a global economic growth slowdown, etc., can make the stock market unstable, potentially causing many adverse effects.

Second, focus on portfolio management to ensure interest in the market, and improve financial knowledge. In particular, investors should focus on stocks of the sector that directly benefit from the government's policies or the economy that is recovering from COVID-19 to minimize the risk of stocks they are buying falling or not reaching the bottom. Specifically, the group of stocks of enterprises involved in the field of public investment are construction and construction materials, banking (selective), securities, information technology, oil and gas.

Thirdly, it is necessary to improve the psychological factor in investment in order to improve the efficiency of investment decisions and have enough confidence to maintain a firm stance so as not to be affected by market fluctuations.

Fourth, constantly update the news to have the necessary amount of information to evaluate companies accordingly. In addition, investors also need to strengthen the initiative and readiness, develop plans and plans for risk management along with learning more about policies related to digital transformation, application of information technology, making the most of opportunities from international integration and the trend of the Industrial Revolution 4.0.

This research plays an important role in showing the influence of factors on investors' stock investment decisions, thereby also providing information for the state to make policies to ensure stability and transparency in the stock market. Securities businesses have a basis for building business strategies and issuing bonds in accordance with the market and investment needs to help individual investors understand themselves and business trends, thereby avoiding risks and easily accepting the risks faced when deciding to make business. At the same time, the research is a reference for stock market researchers on individual investment decisions in the stock market in Vietnam.

There are some limitations of the study. Firstly, the number of research samples is not large enough. Random samples have not been surveyed on other stock exchanges, so the number of samples has not shown the representation of the whole market, therefore, the sample has not shown the diversity of survey subjects. Secondly, this article only explains 76.5% of the variation of investment decisions by

the variation of four variables. Thus, there are many other factors that affect investment decisions that research has not found. Thirdly, the article does not find differences in results between income groups, there may be differences related to demographic factors such as age group, education level, and experience in the stock market so that it can be classified and evaluated more closely about each target group.

As for future research perspectives, a sample size can be increased to ensure high representativeness. In addition, the impact of several other variables such as local culture and politics, level of financial analysis of individuals and financial capacity etc. on investment decisions of individual investors can be studied.

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