Phung Thai Minh Trang; Mai Ngoc Khuong

Article

Personality traits, perceived risk, uncertainty, and investment performance in Vietnam

Global Business & Finance Review (GBFR)

Provided in Cooperation with:
People & Global Business Association (P&GBA), Seoul

Suggested Citation: Phung Thai Minh Trang; Mai Ngoc Khuong (2017) : Personality traits, perceived risk, uncertainty, and investment performance in Vietnam, Global Business & Finance Review (GBFR), ISSN 2384-1648, People & Global Business Association (P&GBA), Seoul, Vol. 22, Iss. 1, pp. 67-79,
https://doi.org/10.17549/gbfr.2017.22.1.67

This Version is available at:
https://hdl.handle.net/10419/224363

GLOBAL BUSINESS & FINANCE REVIEW, Volume. 22 Issue. 1 (SPRING 2017), 67-79
pISSN 1088-6931 / eISSN 2384-1648 | Http://dx.doi.org/10.17549/gbfr.2017.22.1.67

GLOBAL BUSINESS & FINANCE REVIEW

www.gbfrjournal.org

Personality Traits, Perceived Risk, Uncertainty, and Investment Performance in Vietnam

Phung Thai Minh Trang[a] and Mai Ngoc Khuong[b]

[a] Lecturer, Department of Accounting and Finance, Hoa Sen University, Ho Chi Minh City, Vietnam
[b] Lecturer, School of Business, International University - Vietnam National University, Ho Chi Minh City, Vietnam

A B S T R A C T

The study explored the impact of personality traits, perceived risk, and perceived uncertainty on investment performance of individual investors trading on the Vietnam stock market. The study conducted in-depth interviews, a pilot study, and a survey distributed to 430 individual investors. Results showed that Conscientiousness and perceived uncertainty directly affected investment performance. Openness, Extraversion, and Neuroticism indirectly influenced investment performance through the mediation of perceived uncertainty. This study suggested that individual investors should perceive uncertain situations when they invest in securities. Especially, investors who are prone to Openness, Extraversion, and Neuroticism must pay attention to uncertainty before they make investing decisions. Since Agreeableness did not affect investment performance, those who are dominant to this trait should have prudent considerations for equity investment decisions.

Key words: Investment Performance; Perceived Risk; Personality Traits; Uncertainty

Ⅰ. Introduction

Personality traits were early mentioned by Allport and Odbert (1936) who suggested more than 4,000 words for describing characters of human beings. Over the past decades, McCrae and Costa (1992; 1997) designed the Big Five personality traits consisting of Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. Currently, the Big Five is the most popular because "it can capture, at a broad level of abstraction, the commonalities among most of the existing systems of personality traits" (John & Srivastava, 1999, p. 122). Additionally, Knight (1921) highlighted that risk related to situations that their outcomes were unknown but controlled by probability distributions known at the outset, while uncertainty involved in situations that their outcomes and probability distributions were fully unknown. In other words, ambiguity has been realized as a type of uncertainty separate from the standard concept of risk and is referred from the absence of exact information on probabilities (Knight, 1921; Ellsberg, 1961). In fact, the decision maker cannot "unambiguously assign a definite probability to each, and every event" (Ellsberg, 1961; Dequech, 2011, p.630). Importantly,

Received :Aug. 11, 2016; Revised : Nov. 16, 2016; Accepted : Feb. 1, 2017

† Phung Thai Minh Trang
Lecturer, Department of Accounting and Finance, Hoa Sen University, Ho Chi Minh City, Vietnam
E-mail: phungthaiminhtrang@gmail.com

everyone always expects to prevent risk when making decisions rather than maximize utility, hence perceived risk is considered as a powerful instrument to explain behavioral biases (Mitchell, 1999). The term of perceived uncertainty occurred over the past decades. Gifford et al (1979) emphasized that "the responses are the judgments or verbal reports of perceived uncertainty by decision maker". Interestingly, the term of perceived risk was derived from consumer behavior and Bauer (1960) initially stated this term and strongly emphasizes that perceived risk was involved only in subjective perceived risk and not objective risk. Particularly, Dowling and Staelin (1994) designed a model of perceived risk which has become popular over the past years. The model suggested that to evaluate a consumer's overall perceived risk, one needs to identify two key factors including product specific risk and product class risk (Dowling and Staelin, 1994, p.121).

Over the past fifteen years, Vietnam Stock exchange in general went through many different stages. Its prices fluctuated, up and down, and it seemed to be difficult for investors to make sound investment decisions. Especially, with the boom of VN-Index 2007, the stock market had never been "hotter" than at that time. Economic experts and analysis explained the sharp decline of the VN-Index that was affected by various factors such as lack of timely intervention by the authorities, the tightening of monetary policies, the lending for stock investment, high deposit interest rates, high inflation rates, and a recession in the United States economy (Thanh and Quang, 2008). Especially, irrational behavior led investors who joined the market during this period to face severe financial difficulty (Huy, 2010). More significantly, a number of individual investors trading on the stock market have decreased in recent years. A brokerage director of a Securities Corporation said that a number of real investors traded in the stock market the past two years, 2014-2015, just took fifty percent over a quantity of accounts registered and main causes led this decline were that investors often faced with loss caused by irrational decisions in investing securities. Especially, most investors did not seem to realize the importance of knowing who they were and whether or not what personality traits were suitable for stock investment as well as of perceived risk and uncertainty when investing in securities.

To date, many studies have focused on the effects of behavioral biases on investment decisions (Cuong & Jian, 2014; Ton & Dao, 2014). However, the relationship among personality traits, perceived risk and uncertainty, and investment performance have not been discovered. Therefore, the objectives of the study are to explore: firstly, the direct relationship between personality traits and investment performance of individual investors; secondly, exploring mediating roles of perceived risk and perceived uncertainty in the effects of the personality traits on investment performance. The main research question is "to what extent the Big Five personality traits of individual investors directly and indirectly affect their investment performance through perceived risk and uncertainty?" Applying consumer behavior such as perceived risk of investing in stock types and uncertainty for financial decisions is considered as a new contribution of this study.

Ⅱ. Literature Review

A. The Big Five personality traits

The idea of personality traits occurred Before Christ (BC). Aristotle (384-322 BC) saw dispositions including "vanity, modesty, and cowardice as key determinants of moral and immoral behavior" (Matthews et. al. 2009, p. 3). Over the past decades, Allport and Odbert (1936) suggested more than 4,000 words for describing characters of human beings. Additionally, Cattel et al. (2008) recommended the sixteen personality factor (16PF) which became a standard personality measure, but enclosed several criticisms because of some scales being low. Eysenck (1997) gave three broad personality factors such as

neuroticism, extraversion-introversion, and psychoticism. Over the past several years, the Big Five signed as NEO-PI-R (Neuroticism, Extraversion, Openness − personality inventory − revised) in 1992 or NEO-PI-3 with simpler vocabularies in 1997, which was developed from the NEO currently becomes "the leading instrument used to assess the traits of the five factor model" (Matthews et. al. 2009, p. 19). Primarily, NEO-PI-R contained 240 questions, 48 for each of the five domains, in which every question is designed in accordant with 5-point scales from strongly disagree to strongly agree. And then, McCrae and Costa (1992) shortened the 60-item NEO-Five factor inventory (NEO-FFI). The Big Five personality traits produced by McCrae and Costa (1992; 1997) contains the five broad dimensions related to human personality such as Openness to experience (O) including fantasy, feelings, actions, etc., Conscientiousness (C) embracing competence, order, dutifulness, etc., Extraversion (E) encompassing warmth, excitement-seeking, etc., Agreeableness (A) involving trust, straightforwardness, compliance, etc., and Neuroticism (N) consisting of anxiety, angry hostility, depression, etc. Subsequently, there are shorter versions such as 44-item inventory (John & Srivastava, 1999) and 21-item inventory (Kovaleva et al., 2013) because of "the time available for the measurement of each individual construct is often limited" (Kovaleva et al., 2013, p. 35).

B. Perceived risk and uncertainty

Perceived risk which had origins in consumer behavior initially defined by Bauer (1960) as "in the sense that any action of a consumer will produce consequences which he cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant". In addition, perceived risk is also considered as "the expectation of losses associated with purchase and acts as an inhibitor to purchase behavior" (Peter & Ryan, 1976) or "the citizen's subjective expectation of suffering a loss in pursuit of a desire outcome" (Bélanger and Carter, 2008). More importantly, perceived risk owns two components: the first one related to one's subjective feelings of certainty that the results of an action will be unfavorable, e.g. financial lost, time wasted, social problems, etc., and the second one involved in sum of money lost if the results are not favorable (Bauer, 1960). Dowling and Staelin (1994) also proposed perceived risk with two components embracing product class risk, e.g. a category of product, and product specific risk, e.g. a specific brand or product.

Perceived uncertainty was considered as subjective perception of a decision maker about uncertain potential consequences of an action since he/she did not entirely know about the likelihood of these results (Knight, 1948). Hubbard (2010) emphasized that uncertainty as "the lack of certainty, a state of having limited knowledge where it is impossible to exactly describe existing state or future outcome, more than one possible outcome". Klir & Wierman (1999) state that at the cognitive level, uncertainty "emerges from the vagueness and ambiguity inherent in natural language" (p.165). Ambiguity is referred from the absence of exact information on probabilities, in which it has been realized as a type of uncertainty separate from the standard concept of risk (Knight, 1921; Ellsberg, 1961).

Differences between perceived risk and uncertainty when making decisions were mentioned over the last decades. Luce and Raiffa (1957) showed that decision making under risk related to every action which owned a set of possible given outcomes with a known probability, whereas decision-making under uncertainty occurs when possibilities of these outcomes for every action are totally unknown. Takemura (2014) also exposes that decision under risk which refers to a situation occurred with known probability as the consequence of choosing an alternative, and decision under uncertainty in which the probability of the outcome of choosing an alternative is unknown. Takemura (2014) divided decision under uncertainty into two categories including decision making under ambiguity which refers to "a state in which although the condition and results that will occur are known, the probabilities

of the condition and results to occur are unknown" and decision making under ignorance, where "the range of alternatives, possible states, and the range of results are not clearly known" (p.8-9). More importantly, Takemura (1996; 2014) states that decision making under ignorance in which "the entire set is unknown are nearly nonexistent" (p.9). Similarly, differences between risk and ambiguous events are that risk events related to a known probability distribution over outcomes, while ambiguous events concerned with the probability distribution unknown (Ghirardato & Marinacci, 2001; Epstein, 1999).

C. The Big Five and Perceived risk and uncertainty

Not many studies related to the relationship among the Big Five traits, perceived risk and uncertainty of individual investors trading on the stock market. The study presents researches involve in this relationship, but other fields such as tourism, social network, medicine, and workplace. Lee and Tseng (2015) studied the relationship between personality traits, risk-taking and behavior of adventure recreationists with 436 questionnaires related to white water rafting and 407 questions involved in the scuba diving activity in Taiwan. Results showed that extraversion and openness positively affected the risk-taking attitude of both groups and conscientiousness had a negative influence on risk-taking attitude in scuba drivers. Although managerial implication were discussed, this study gave some limitations related to research scopes in which focused on in Taiwan and mentioned two types of adventure activities: white water rafting and scuba diving while other activities including paragliding, light aircraft, rock climbing, etc. have not been discovered yet. The study also suggested testing other aspects that impacted adventure behavior such as enduring involvement, activity attachment, and the serious leisure of recreationists. Moreover, Loiacono (2015) surveyed 359 people to serve the research involved in the impact of self-disclosure behavior on social networking web sites. Consequences indicated that perception of risk, perception of benefit, extraversion, agreeableness, and neuroticism had a strong influence on one's decision to self-disclose. Besides, perceived risk had the relationship with openness, conscientiousness, and extraversion. However, when using post hoc analysis, the change in R^2 (from 0.26 to 0.28) was insignificant and proposed to have further research concerned with this issue. Additionally, the study suggested asking respondents to assess a specific social networking system (SNS), e.g. face book as "personal page" and LinkedIn as "professional page" to consider how users behave while interacting with each. The study proposed paying attention to age differences that have impact this model. Finally, it needs to have further research about the relationship between personality traits and perceived risk and benefit. For medicinal products, Beyer et al. (2015) surveyed 75 European medical assessors for the research of risk attitudes and personality traits which predict perceptions of benefits and risks for medicinal products. Results presented that an increase in the conscientiousness score estimated an increase in the perception of the drug's benefit. Especially, people who were extraverted had fewer risks, and who were neutral-averse or risk-averse owned greater risks. Further research was proposed to determine how these potential biases were conducted within the regulatory setting. Caligiuri and Tarique (2012) studied the relationship between personality traits and tolerance of ambiguity (TA) by surveying 420 global leaders and 221 supervisors. Consequences indicated that Extraversion and Openness had strong positive correlation with TA. Agreeableness negatively correlated with TA. Whereas, Neuroticism and Conscientiousness had no correlation with TA. The sample of global leaders that 64% of respondents came from U.S. was considered as a limitation of the research because leaders from smaller countries might have different results. Additionally, the study emphasized only on individual work performance while other important factors such as organizational commitment, interpersonal effectiveness, and

decision making were ignored. Finally, the authors suggested developing cross-cultural experiences that displayed through both work-involved and non-work activities. Interestingly, Lauriola and Levin (2001) used an Italian sample of different age levels to examine the interaction between the Big Five, demographics and risk-taking. The findings showed that personality factors estimated risk-taking initially in the area of gains in which high scores on openness to experience were correlated with greater risk-taking and high scores on neuroticism were associated with less risk-taking. However, there was a trend for neuroticism to have the opposite impact on risk-taking for losses in which high scores were associated with greater risk-taking.

Apparently, there are rarely prior research related to the relationship between personality traits and perceived risk and uncertainty in the context of stock markets. Hence, this study hypothesizes the effects of personality traits of individual investors on perceived risk and uncertainty in investing stocks in Vietnam. Namely:

H1 (1.1-1.5): Openness to experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism significantly affect perceived risk, respectively.

H2 (2.1-2.5): Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism significantly affect perceived uncertainty.

D. The relationship between Big Five, perceived risk, perceived uncertainty and investment performance Personality traits and investment performance

There are many studies involved in this relationship. Rizvi and Fatima (2015) studied the relationship between personality traits and the stock investment by making online survey to 100 investors trading or not trading in the Indian stock market. Results showed that age group (18-28 and 29-39 ages), gender (dominant male), number of dependents, income level, extraversion, agreeableness, conscientiousness, neuroticism and openness personality dimension had significant impact on stock market investment. Neuroticism also associated with negative market returns (Gherzi et al., 2014). Specifically, the author made a survey of 617 investors and explored the personality trait, neuroticism, moderated the pattern of portfolio. Additionally, Nga and Yien (2013) explored the significant impact of conscientiousness on risk aversion, openness on cognitive biases and agreeableness on socially responsible investment in the context of Malaysian undergraduates. Schröder (2011) used α-MEU preferences to discovered that ambiguity played an important role in investment decisions and led to an increase in the subjective value of project, and investors are keen on investing.

Perceived risk, perceived uncertainty and investment performance

Nepomuceno et al. (2014) studied the reduction of perceived risk when using online purchase. Product intangibility, knowledge, brand, privacy and security were considered as mediated factors. Respondents who were students joined online experimental tests. Consequences presented that both physical and mental intangibility increased perceived risk. Mental tangibility affected perceived risk rather than physical tangibility. The mediated factors such as intangible security and privacy concerns increased perceived risk and product knowledge decreased the perceived risk more than brand familiarity. Importantly, uncertainty depressed capital investment (Stein and Stone, 2013). This result came from using data from 2001-2011 for 3,965 U.S. public businesses. Hong and Yi (2012) also studied the impact of risk perception on on-line buying decision in China by delivering 500 questionnaires to 200 high school and college's students and 300 experienced netizens including entrepreneurs, technicians, etc. However, there were only 327 respondents answered officially. Results showed that financial risk, performance risk and service risk affected consumers' on-line purchasing decision. Moreover, Laroche et al. (2010) studied the relationship between intangibility and perceived risk through involvement and product

knowledge by surveying 783 students as respondents. Results showed that brands were more mentally intangibility than product categories, which led to evaluation difficulty. Besides, evaluation difficulty increased the perceived risk in the aspect of product categories. Finally, the study explored that regarding the product category perspective, the higher involvement generated, the stronger association between evaluation difficulty and perceived risk. Fisch (2008) analyzed investment under perceived uncertainty. A panel study of 634 German subsidiaries were used for this study. Consequences indicated that uncertainty affected investment. During a learning process, investors perceived receding levels of uncertainty and change their reasons for investment. Temple and Driver (2001) studied the effect of uncertainty on UK investment by analyzing industry level panel data including the UK Census of Production and the CBI Industrial Trends Survey. Results showed that both sources of uncertainty had a negative influence on investment and financial factors was important for some industries. As presented above, the study hypothesizes as follows:

H3 (3.1-3.7): Openness to experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism, Perceived risk, and Perceived uncertainty significantly affect investment performance, respectively.

H4 (H4.1-H4.5): the effect of Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism on investment performance is mediated by perceived risk, respectively.

H5 (H5.1-H5.5): the effect of Openness to experience, Conscientiousness, Extraversion, Agreeableness and Neuroticism on investment performance is mediated by perceived uncertainty, respectively.

Ⅲ. Methodology

A. Research method, samples and research instruments

This study employed both the in-depth interviews and a survey. Firstly, the author used in-depth interviews to experts who each have over 10 years of experience in investing in the Vietnam stock market in order to explore key factors affected investment performance. Secondly, the study used a pilot survey involving 50 investors to test the reliability of the measurement scales of the questionnaires, and then a survey distributed to 430 individual investors. The authors applied questionnaires with a 5-point Likert scale, from totally disagree to totally agree, derived from prior scholars such as 21 personality traits designed by Kovaleva et al. (2013), investment performance measured by Pasewark and Riley (2010), perceived uncertainty from Greco and Roger (2001), and perceived risk from Laroche et al. (2004).

More importantly, items of perceived risk the authors discovered through in-depth interviews are stock types trading on the Vietnam stock market, including stocks labelled as “warned”, “controlled”, stocks that halted or suspended trading, highly speculative stocks, blue chip stocks, fund certificates, VN30 indexed stocks, and stocks with low liquidity. Details are presented below:

RISK1:	I feel it is risky to invest in stocks labelled as “warned”.
RISK2:	I feel it is risky to invest in stocks labelled as “controlled”.
RISK3:	I feel it is risky to invest in stocks that halted or suspended trading.
RISK4:	I feel it is risky to invest in highly speculative stocks.
RISK5:	I feel it is risky to invest in blue chip stocks, fund certificates or VN30 indexed stocks.
RISK6:	I feel it is risky to invest in stocks with low liquidity.

Sources by authors

Target population of this research is all investors trading on the Vietnamese stock market. The total number of private investors’ accounts traded on the stock market was around a million five hundred in 2015. To determine the sample size, Krejcie and Morgan (1970) proposed the following formula:

$$s = X^2\ NP\ (1-P) \div d^2\ (N-1) + X^2\ P\ (1-P)$$

Where: s = required sample size; X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level (3.841); N = the population size; P = the population proportion (assumed to be .50 since this would provide the maximum sample size); d = the degree of accuracy expressed as a proportion (.05).

From the formula above, the study calculated the sample size as follows:

s = (3.841 × 1,500,000 × 0.5(1 − 0.5) / {0.05 × 0.05(1,500,000 − 1) + 3.841 × 0.5(1 − 0.5) = 384 investors

After adjusting the questionnaire to suit the Vietnamese context, the pilot survey with random sample of 50 investors aims to test the reliability of the measurement scales. Finally, with support from securities corporations, questionnaires were sent to 450 private investors trading on the Vietnam stock exchange. The survey lasted eight months with 430 valid returned questionnaires.

Multiple regression analysis is presented through equations below:

Equation (1):

Perceived risk = α + β_1 Extraversion + β_2 Neuroticism + β_3 Openness + β_4 Agreeableness+ β_5 Conscientiousness + €

Equation (2):

Perceived Uncertainty = α' + β'_1 Extraversion + β'_2 Neuroticism + β'_3 Openness + β'_4 Agreeableness + β'_5 Conscientiousness + €'

Equation (3)

Investment performance = + ℓ_1 Extraversion + ℓ_2 Neuroticism + ℓ_3 Openness + ℓ_4 Agreeableness + ℓ_5 Conscientiousness + ℓ_6 perceived risk + ℓ_7 perceived uncertainty + ¥

Tests for reliability and validity of the research are done by SPSS software. Significance of mediated variables was checked by bootstrapping method recommended by Preacher & Hayes (2008).

B. Factor analysis and reliability test

For this study, there are two separated Exploratory Factor Analyses (EFA) for dependent variables and independent variables were conducted with Kaiser-Meyer-Olkin and Barltlett's test of sphericity, and Varimax Rotation.

The first EFA was conducted for the group of independent variables of investors' personality traits (Big Five). Kovaleva et al. (2013) suggested to invert 8 items of personality traits turned totally disagree (1) into totally agree (5), disagree (2) to agree (4), and moderate (3) unchanged, which involve EXT3: I am quiet; EXT4: I am reserved; AGR2: I tend to find fault with others; AGR3: I can be cold and aloof; AGR4: I am sometimes rude to others; CON4: I tend to be lazy; NEU4: I am relaxed, handles stress well; OPEN5: I have few artistic interests. As shown in Table 1, KMO index is 0.783 which is marvelous and Bartlett's Test of Sphericity sig. value is .000. Therefore, this data is considered appropriate for factor analysis. The table also indicated 5 components of personality traits which were rated appropriate for retaining and explained more than 68 percent of the total variance. The result also showed that after the Varimax rotation, all items of the Big Five have factor loading greater than 0.5. Furthermore, for the validation and internal consistency test, all the Cronbach's alpha values ranged from 0.692 to 0.853 which were acceptable.

Similarly, the table 2 shows that the KMO index is 0.799 and the significance of Bartlett' test is .000 which is appropriate to conduct the factor analysis. Moreover, the 3 dependent variables explain 55.814 percent of the total variance with all factors loading

Table 1. Summary of Independent Variables with Reliability Coefficients

Variables	No. of items	Cronbach's Alpha
Openness	4	0.736
Conscientiousness	3	0.730
Extraversion	2	0.809
Agreeableness	3	0.692
Neuroticism	3	0.853

Table 2. Summary of Dependent Variables with Reliability Coefficients

Variables	No. of items	Cronbach's Alpha
Investment performance (INVESPER)	6	0.773
Perceived risk (PERISTOCK)	4	0.818
Perceived uncertainty (PERUNCER)	3	0.607

greater than 0.50 and Cronbach's Alpha values ranged from 0.607 to 0.818 which were also acceptable.

Ⅳ. Results

A. Characteristics of respondents

Individual investors were male with 58.8% of the total sampling while the remaining being female. In regards to the investors' age: 51.2% of them ranged in age from 26 to 35. In terms of their education, 70.9% had a university degree. In regards to income levels: 44.9% of the investors earned between 6 and 12 million VND per month, 27% earned under 6 million VND/month. In regards to their work experience: most investors (49.1%) had worked less than 5 years, 41.2% worked from 5 to 10 years. Regarding to how long these respondents had been investors: 31.6% were investors from 1 to 3 years, 27.9% had invested for under 1 year, 21.4% from 3 to 5 years. Interestingly, 63.5% of them had received some type of formal training on securities investment. Finally, examining the amount of their investment portfolio: 45.1% of the investors had invested less than 100 million VND, and 26.7% invested between 100 to 300 million VND.

B. Correlations of variables

The study discovered correlations and significant levels between personality traits, perceived risk and uncertainty, and investment performance. As shown in Table 3, firstly, some traits had a strong correlation with investment performance (INVESPER) such as Neuroticism at $r = -0.085$ ($p<0.05$), Openness at $r = 0.208$ ($p<0.001$), Conscientiousness at $r = 0.242$ ($p<0.001$), Extraversion at $r = 0.228$ ($p<0.001$), Perceived risk at $r = 0.176$ ($p<0.001$), and Perceived uncertainty at $r = 0.244$ ($p<0.001$). Agreeableness did not have significant correlations with investment performance. Besides, personality traits mutually correlated as well as perceived risk and uncertainty. All were shown in Table 3 below.

Table 3. Correlations between Variables of the Research Model

	INVESPER	1	2	3	4	5	6	7
1. Neuroticism	-.085*	1.00						
2. Openness	.208*	-.087*	1.00					
3. Conscientiousness	.242*	-.196*	.462*	1.00				
4. Agreeableness	.042	-.395*	.123*	.094*	1.00			
5. Extraversion	.228*	-.220*	.284*	.360*	.210*	1.00		
6. PERISTOCK	.176*	-.110*	.196*	.206*	.080*	.275*	1.00	
7. PERUNCER	.244*	.029	.260*	.220*	.095*	.350*	.227*	1.00
Mean	3.27	2.67	3.52	3.69	3.33	3.83	3.77	3.63
SD	.609	.876	.628	.580	.746	.726	.762	.633

* Significant level at $p<0.05$

C. Results of direct effects

The study analyzed multiple regressions to explore variables directly and significantly affecting Perceived risk, uncertainty and investment performance. For relationship between the Big Five and perceived risk and uncertainty, the linear regression equations were significantly found and shown as follows:

Perceived risk = 2.222 + 0.222 Extraversion*** (1)
Perceived uncertainty = 1.366 + 0.106 Neuroticism** + 0.150 Openness** + 0.264 Extraversion*** (2)
with *: p<0.05; **: p<0.01; ***: p<0.001

Firstly, the equation (1) showed that Extraversion significantly influenced perceived risk. Specifically, the unstandardized coefficient for extraversion at (B=0.222, p<0.001) in which it can be interpreted that for every additional extraversion such as outgoing, sociable and enthusiasm, an investor's perceived risk of investing stocks increased 0.222.

Secondly, the equation (2) indicated that three personality traits including Neuroticism at B = 0.106 (p<0.01), Openness at B = 0.150 (p<0.01), and Extraversion at B = 0.264 (p<0.001) significantly affected perceived uncertainty. They were explained that for every additive Neuroticism such as nervous, worried and depressed, Openness: artistic, aesthetic, curious, active, and ingenious, and Extraversion: happy or joyful, an individual's perceived uncertainty increases 0.106, 0.150, and 0.264, respectively.

For direct impact on investment performance, the linear regression equation was significantly found and can be presented as follows:

INVESTPER = 1.688 + 0.129 Conscientiousness* + 0.149 Perceived uncertainty** (3)
Where: *: p<0.05; **: p<0.01; ***: p<0.001

Finally, the equation (3) presented that Conscientiousness and perceived uncertainty significantly affect investment performance. Namely, Conscientiousness had B = 0.129 (p<0.05), and Perceived uncertainty at B = 0.149 (p<0.01). Details are presented in Figure 1 below:

D. Results and significance of indirect effects

The study explored that Neuroticism, Openness and Extraversion had indirect influences on investment performance. Interestingly, when investing in securities, the combination between Neuroticism and perceived uncertainty (mediated variable) at the same time will help increase at 0.016 for every additive to this combination. Moreover, the interaction between Openness and perceived uncertainty will support an investor to increase at 0.022 for every addition. Particularly, if an investor

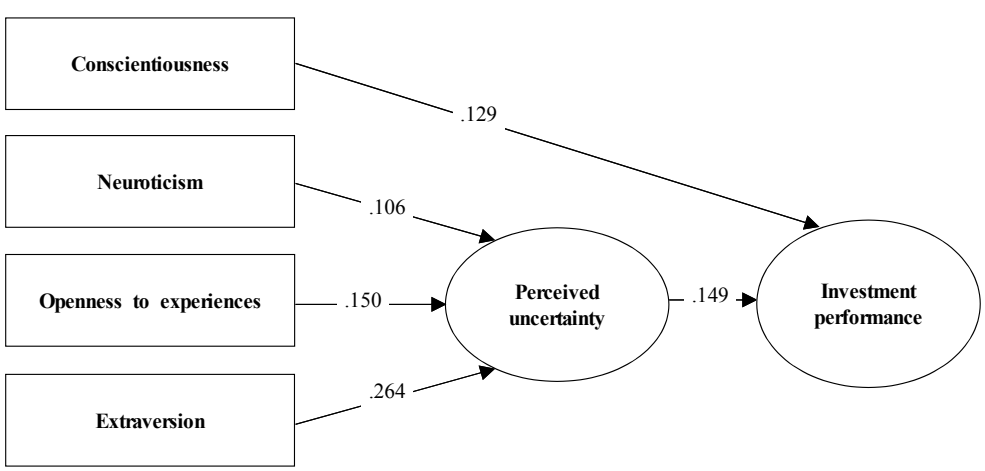

Figure 1. Path Significant Coefficient of the Investment Performance Model

simultaneously integrates his extraversion and perceived uncertainty, one will increase at 0.039. More details are shown in Table 4 below:

More importantly, the study checked significance of indirect effects or mediations by using bootstrapping method recommended by Preacher & Hayes (2008). The results give the bootstrapped confidence intervals at the 95%. If a ZERO (0) is in the interval range of the lower and the upper boundary, it is concluded that mediation or indirect effect is insignificant. Conversely, if the ZERO does not place in this interval, between lower and upper level, it is confirmed that, the mediated effect is significant ($p<0.05$) (Preacher and Hayes, 2004). As displayed in Table 4, the indirect effects of Neuroticism, Openness, and Extraversion on investment performance through the mediation of perceived uncertainty were estimated to lie between 0.005 and 0.0298, 0.0067 and 0.0414, and 0.0172 and 0.643, with 95% confidence, respectively. Apparently, the zero was not in this interval confidence. Therefore, the mediations of perceived uncertainty were significant.

Ⅴ. Discussion and Recommendations

Firstly, the hypothesis H1.3 was supported, in which Extraversion positively affected perceived risk. In addition, the findings also supported H2.1, H2.3 and H2.5, in which Openness, Extraversion, and Neuroticism positively influenced perceived uncertainty. Although it is not likely to be the same major, these results are consistent with many previous researches conducted by Lee and Tseng (2015), Loiacono (2015) and Caligiuri and Tarique (2012). Investors whose character is prone to Extraversion such as outgoing, sociable, and enthusiasm perceived risk when investing in stocks. More specifically, they feel it is risky to invest in stocks labelled “warned”, “controlled”, or stocks have halted trading, or highly speculative stocks. Whereas, other personality traits such as Neuroticism, Openness, Conscientiousness, and Agreeableness had no impact on this perception. Most investors trading on the Vietnam stock market were young (over 70 % of them ranged in age from 18 to 35) and invested in stocks for under 1 year or from 1 to 3 years. Therefore, they were not interested in these stock types because they do not have enough confidence to tackle dangerous situations when investing these securities. For people whose personality traits dominate Neuroticism, the more they get nervous easily and worry a lot, the higher they generally expect the worst to happen, try to avoid uncertain situations, and think things over thoroughly before making any changes. For investors whose have a propensity to Openness, they positively affected perceived uncertainty, in which the more they value artistic, aesthetic experiences, and curious about many different things, have an active imagination, are ingenious, and a deep thinker, the higher their uncertain perception is. For individuals whose personality trait possesses extraversion more than other traits, the more they are outgoing, sociable,

Table 4. Direct, indirect and total of causal effects

Variables	Causal effects			LLCI	ULCI
	Direct	Indirect	Total		
Neuroticism	----	.016	.016	.0050	.0298
Openness	----	.022	.022	.0067	.0414
Extraversion	----	.039	.039	.0172	.0643
Conscientiousness	.129	----	.129		
Peruncer	.149	----	.149		
Total	**.278**	**.077**	**.355**		

Note: LLCI: lower level confidence interval, ULCI: upper level confidence interval.

and enthusiasm, the better they perceive uncertainty in investing in securities.

In addition, the hypothesis of H3.2 was also supported. Conscientiousness significantly affected investment performance. Generally, these consequences are similar to the research findings of Rizvi and Fatima (2015), and Nga and Yien (2013). Apparently, for investors possessing Conscientiousness, the more they do things efficiently, do a thorough job, plan and follow through with them, the higher their investment performance is. More specifically, their investment results are better than expected, has a high degree of safety, has lower risk compared to the market in general, has high rates of earnings growth in the past 5−10 years, has higher than average earnings projections for the next several years, and proceeds of stocks sales will be used in a way that they find productive. Notably, Rizvi and Fatima (2015) stated that all personality traits of the Big Five fully affected stock market investment in India, while Agreeableness had no direct impact on investment performance in Vietnam. These different results need to have further projects conducted and completed to validate more accurate conclusions.

Furthermore, the result supported the hypothesis H3.7, in which perceived uncertainty significantly affected investment performance. Basically, these consequences are comparable and consistent with research conducted by Stein and Stone (2013), Fisch (2008), and Temple and Driver (2001). Interestingly, avoiding this ambiguity or thinking carefully before making any changes made an investor achieve good results in investing securities. In contrast, perceived risk did not affect investment performance because most young investors hesitate to deal with dangerous investment.

In other word, the study supported the H5.1, H5.3 and H5.5 hypotheses related to mediation analysis of perceived uncertainty in which it plays an important role in the results of investment. Excitingly, although Neuroticism did not directly affect investment performance, if investors have both including this trait and perceived uncertainty at time of their investment, then investment performance is positively affected and changed from 0 to 0.016 for every addition. Similarly, Openness did not directly influence investment performance, but if an individual integrates this trait with perceived uncertainty, his/her investment performance will have a positive change from 0 to 0.022 for every addition. More importantly, for investors whose personality are prone to Extraversion, when they combine this personality trait and perceived uncertainty, their investment results become better and have the highest increase from 0 to 0.039 for every additive to this combination.

In summary, investors should draw attention to the effects of perceived uncertainty when making decisions on investing in securities on the Vietnam stock exchange. Particularly, if investors have dominant to Conscientiousness, they will achieve a good investment result. Besides, these investors should perceive uncertain situations when making decisions on investing in order to receive higher profits as well as satisfaction with their investment results. For investors who are prone to Neuroticism, Openness and Extraversion, these traits must be integrated with perceived uncertainty for yielding good investment results. For investors who are dominant to Agreeableness, they should refrain from investing in securities.

Ⅵ. Conclusion

The study achieved all the objectives that were proposed. Firstly, it explores Conscientiousness directly influence investment performance. Additionally, the study also found out that Neuroticism, Openness to experience, and Extraversion directly impacted perceived uncertainty; Extraversion directly affected perceived risk. Finally, the paper discovered that Neuroticism, Openness to experience, and Extraversion affect investment performance through perceived uncertainty. And then, some recommendations are exposed to individual investors trading on the Vietnam stock market.

The study used mix methods including interviews and questionnaires to individual investors. And then, the study applied factor analysis, multiple regression analysis, and path analysis for achieving empirical results. Moreover, the study explained the correlation of independent variables mutually and between independent and dependent variables. Mediation analysis and significant level of mediated variables are concretely mentioned. The direct and indirect effects were fully explained to achieve the research objectives as well as hypotheses supported. In general, this research contributes to the field of personality traits, perceived risk, uncertainty and investment performance of individual investors.

Further researches should take notice of mediating roles of behavioral biases, e.g. loss aversion and gambler's fallacy in the effects of personality traits on investment performance or investment intention since losses are twofold as powerful as gains and reversed points-based decision making (Kahneman & Tversky, 1984).

Acknowledgements

The authors are grateful to the anonymous referees of the journal for their extremely useful suggestions to improve the quality of the article. In addition, the authors express our sincere thanks to financial advisors, experts, managers, individual investors, Hoa Sen University, and a proofreader for your support and contributions to our article.

References

Allport, G. W., & Odbert, H. S. (1936). Trait-names: A psycho-lexical study. *Psychological monographs*, *47*(1), i-171.

Bauer, R.A. (1960). Consumer Behavior as Risk-Taking, Dynamic Marketing for Changing World. American Marketing Association, Chicago, 389-398.

Beyer, A. R., Fasolo, B., de Graeff, P. A., & Hillege, H. L. (2015). Risk Attitudes and Personality Traits Predict Perceptions of Benefits and Risks for Medicinal Products: A Field Study of European Medical Assessors. *Value in Health*, *18*(1), 91-99.

Bélanger, F., & Carter, L. (2008). Trust and risk in e-government adoption.*The Journal of Strategic Information Systems*, *17*(2), 165-176.

Cattell, H. E., & Mead, A. D. (2008). The sixteen personality factor questionnaire (16PF). *The SAGE handbook of personality theory and assessment*, *2*, 135-178.

Caligiuri, P., & Tarique, I. (2012). Dynamic cross-cultural competencies and global leadership effectiveness. *Journal of World Business*, *47*(4), 612-622.

Costa, P. T., & McCrae, R. R. (1992). *Neo Personality Inventory-Revised (NEO PI-R)*. Odessa, FL: Psychological Assessment Resources.

Cuong, P. K., & Jian, Z. (2014). Factors Influencing Individual Investors' Behavior: An Empirical Study of the Vietnamese Stock Market. *American Journal of Business and Management*, *3*(2), 77-94.

Dequech, D. (2011). Uncertainty: a typology and refinements of existing concepts. *Journal of economic issues*, *45*(3), 621-640.

Dowling, G. R., & Staelin, R. (1994). A model of perceived risk and intended risk-handling activity. *Journal of consumer research*, 119-134.

Ellsberg, D. (1961). Risk, ambiguity, and the Savage axioms. *The quarterly journal of economics*, 75(4), 643-669.

Epstein, L. G. (1999). A definition of uncertainty aversion. *The Review of Economic Studies*, *66*(3), 579-608.

Eysenck, H. J. (1997). Personality and experimental psychology: the unification of psychology and the possibility of a paradigm. *Journal of Personality and Social Psychology*, 73(6), 1224−1237.

Fisch, J. H. (2008). Investment in new foreign subsidiaries under receding perception of uncertainty. *Journal of International Business Studies*, *39*(3), 370-386.

Gherzi, S., Egan, D., Stewart, N., Haisley, E., & Ayton, P. (2014). The meerkat effect: Personality and market returns affect investors' portfolio monitoring behaviour. *Journal of Economic Behavior & Organization*, *107*, 512-526.

Ghirardato, P., & Marinacci, M. (2001). Risk, ambiguity, and the separation of utility and beliefs. *Mathematics of operations research*, *26*(4), 864-890.

Gifford, W. E., Bobbitt, H. R., & Slocum, J. W. (1979). Message characteristics and perceptions of uncertainty by organizational decision makers. *Academy of Management Journal*, *22*(3), 458-481.

Greco, V., & Roger, D. (2001). Coping with uncertainty: The construction and validation of a new measure. *Personality and individual differences*, *31*(4), 519-534.

Hong, Z., & Yi, L. (2012). Research on the influence of

perceived risk in consumer on-line purchasing decision. *Physics Procedia*, *24*, 1304-1310.

Hubbard, D. W. (2010). *How to measure anything: Finding the value of "intangibles" in business*. Hoboken, N.J: Wiley.

Huy, N. (2010). Hoanh trang, song gio, thu thach va an so. *The Saigon Times*, <http://www.thesaigontimes.vn/Home/taichinh/chungkhoan/37597/>, [Retrieved 2011-03-28].

John, O. P., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. *Handbook of personality: Theory and research*, *2*(1999), 102-138.

Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American psychologist*, *39*(4), 341-350.

Kovaleva, A., Beierlein, C., Kemper, C., & Rammstedt, B. (2013). Psychometric properties of the BFI-K: A cross-validation study. *International Journal of Educational and Psychological Assessment*, *13*(1), 34-50.

Klir, G., & Wierman, M. (1999). *Uncertainty-based information: elements of generalized information theory* (Vol. 15). Springer Science & Business Media.

Knight, F. H. (1921). Risk, uncertainty and profit. *New York: Hart, Schaffner and Marx*.

Krejcie, R. V., & Morgan, D. W. (1970). Table for determining sample size from a given population. *Educational and Psychological Measurement*, *30*, 607-610.

Laroche, M., McDougall, G. H., Bergeron, J., & Yang, Z. (2004). Exploring how intangibility affects perceived risk. *Journal of Service Research*, *6*(4), 373-389.

Laroche, M., Vinhal Nepomuceno, M., & Richard, M. O. (2010). How do involvement and product knowledge affect the relationship between intangibility and perceived risk for brands and product categories?.*Journal of Consumer Marketing*, *27*(3), 197-210.

Lauriola, M., & Levin, I. P. (2001). Personality traits and risky decision-making in a controlled experimental task: An exploratory study. *Personality and Individual Differences*, *31*(2), 215-226.

Lee, T. H., & Tseng, C. H. (2015). How personality and risk-taking attitude affect the behavior of adventure recreationists. *Tourism Geographies*, *17*(3), 307-331.

Loiacono, E. T. (2015). Self-disclosure behavior on social networking web sites. *International Journal of Electronic Commerce*, *19*(2), 66-94.

Luce, R. D., & Raiffa, H. (1957). *Games and decisions: Introduction and critical surveys*. New York, NY.: Wiley.

Matthews, G., Deary, I. J., & Whiteman, M. C. (2009). *Personality Traits*. Cambridge University Press.

McCrae, R. R. and Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, *52*(5), 509–516.

Mitchell, V. W. (1999). Consumer perceived risk: conceptualisations and models. *European Journal of marketing*, *33*(1/2), 163-195.

Nepomuceno, M. V., Laroche, M., & Richard, M. O. (2014). How to reduce perceived risk when buying online: The interactions between intangibility, product knowledge, brand familiarity, privacy and security concerns. *Journal of Retailing and Consumer Services*, *21*(4), 619-629.

Nga, J. K., & Yien, L.K. (2013). The influence of personality trait and demographics on financial decision making among Generation Y. *Young Consumers*, *14*(3), 230-243.

Pasewark, W. R., & Riley, M. E. (2010). It's a matter of principle: the role of personal values in investment decisions. *Journal of business ethics*, *93*(2), 237-253.

Peter, J. P., & Ryan, M. J. (1976). An investigation of perceived risk at the brand level. *Journal of marketing research*, 184-188.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, *40*(3), 879-891.

Rizvi, S., & Fatima, A. (2015). Behavioral Finance: A Study of Correlation Between Personality Traits with the Investment Patterns in the Stock Market. In *Managing in Recovering Markets* (pp. 143-155). Springer India.

Schröder, D. (2011). Investment under ambiguity with the best and worst in mind. *Mathematics and Financial Economics*, *4*(2), 107-133.

Stein, L. C., & Stone, E. (2013). The effect of uncertainty on investment, hiring, and R&D: Causal evidence from equity options. *Hiring, and R&D: Causal Evidence from Equity Options (October 4, 2013)*.

Takemura, K. (1996). Ishikettei to Sono Shien [Decision-making and support for decision making]. In S. Ichikawa (Ed.), *Ninchi Shinrigaku* 4kan Shiko [*Cognitive psychology* vol. 4 thoughts] (pp. 81−105). Tokyo: University of Tokyo Press.

Takemura, K. (2014). Decision-Making Phenomenon and Behavioral Decision Theory. In *Behavioral Decision Theory* (pp. 3-13). Springer Japan.

Temple, P., Urga, G., & Driver, C. (2001). The influence of uncertainty on investment in the UK: a macro or micro phenomenon?. *Scottish Journal of Political Economy*, *48*(4), 361-382.

Thanh, V. T., & Quang, P. C. (2008). Managing capital flows: The case of Viet Nam.

Ton, H. T. H., & Dao, T. K. (2014). The Effects of Psychology on Individual Investors' Behaviors: Evidence from the Vietnam Stock Exchange. *Journal of Management and Sustainability*, *4*(3), 125-134.