Psychological Factors behind Risk-Taking Behaviors:

Correlational Relations between Personality Traits and **Financial Risk Tolerance**

by

Zixuan Lin

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Professor Marti G. Subrahmanyam

Professor Yiqing Lu

Professor Yuxin Chen

Faculty Advisers

Thesis Adviser

Abstract

This study was designed with the purpose to measure the level of financial risk tolerance of individual Chinese investors and explore the personality factors that might have influence on individuals' level of risk tolerance. In this study, we studied on the correlational relations between personality traits from Big Five Personality Traits Theory with it sub-dimensions and the level of financial risk tolerance for individual investors in China. In the data analysis of 233 questionnaire participants, reliability analysis, KMO and Bartlett's Test, Principal Component Analysis and Pearson Correlation were introduced and used. Analysis on the risk tolerance of Chinese investors indicated that new investors in China tended to overestimate their level of risk tolerance compared to their risk preferences in real-life investment decisions. Results from statistical analysis showed that six personality sub-dimensions of personality traits— Arrogant, Aggression, Curiosity, Risk Tolerance, Anxiety and Dominance – were founded to have significant correlational relations with level of financial risk tolerance.

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Introduction

Financial risk tolerance (FRT), defined as the maximum amount of uncertainty that an individual is willing to accept when making the financial decisions, is always regarded as a fundamental issue underlying individuals' investment choices. According to Grable and Lytton (1998), there were four fundamental inputs that played an essential role in the financial and investment planning, which were goals, time horizon, financial stability and financial risk tolerance. Financial risk tolerance, different from the other three inputs that were relatively easy to measure, seemed to be subjective and different from person to person. Callan, Facid & Johnson (2002) also summarized risk tolerance as an attitude that consisted of "a balance of different components". Over time, with the introduction of various financial instruments, financial risk tolerance as a multi-dimensional attitude has naturally become much more complicated.

Since the expected utility is closely related the riskiness of the investment, from the perspectives of both financial advisors and individual investors, a better understanding of financial risk tolerance might help explain the motivation behind financial decisions in a more comprehensive way. Although the importance of financial risk tolerance measurements has been widely recognized by the public, there is still great difficulty to measure the level of financial risk tolerance due to its natural as a complex attitude. For this reason, there are numerous studies try to assess financial risk tolerance with measurements from psychological theories to economic models. As we can see from these past studies, there has been considerable attention paid to the riskiness of the situations and its influence on individual's financial decisions. However, there haven't been a lot of studies that focus on the risk propensity of these decision makers.

Moreover, due to the fact that most studies with topics related to risk preferences were introduced in the western context, there haven't been a lot of studies focusing on individual

investors from other counties such as China. However, the research report showed that China, as one of the biggest finance markets in the world, had had more than 133.76 million investment accounts in its financial market by the end of 2017 (Shenzhen Stock Exchange, 2018). Thus, with the goal to have a better understanding of the investment behaviors of Chinese investors, we would like to introduce this research to study on the financial risk tolerance of Chinese investors.

In this study, we designed to assess the financial risk tolerance with the measurements of psychological factors, and especially the personality traits. In this paper, the level of financial risk tolerance was measured by the questionnaires designed with questions on individuals' past investment behaviors, future expected investments as well as their self-perception in risky situations. We first used these questionnaire answers to explore the level of financial risk tolerance of individual Chinese investors and analyze on the distribution of financial risk tolerance among Chinese investors. In the second part of this study, we also related these financial risk tolerance measures to the personality traits obtained from the psychological questions. With the statistical analysis, we studied on the correlational relations between personality traits and level of financial risk tolerance of Chinese investors.

Literature Review

Factors related to Financial Risk Tolerance

Researchers have been trying to measure risk tolerance from various perspectives for a number of years. Horvath and Zuckerman (1993) suggested that individual's biological, demographic characteristics, together with the psychological factors would affect the level of risk tolerance. Among all the current assessments of financial risk tolerance, demographic and socioeconomics factors were usually used as the key factors to determine the level of risk tolerance (Grable & Joo, 2004). We can see from the past studies that the factors such as gender, family income and age were thought to be significant in differentiating individuals into different risk tolerance levels (Grable & Lytton, 2010). Other factors such as education level, financial knowledge, racial background were also studied as the possible factors that might work as the determinants of financial risk tolerance.

Compared to the general demographic and socioeconomic information, other possible factors such as psychological factors were much less accessible to researchers due to the difficulties of sampling and analyzing. However, as people saw individual's risk tolerance as the comprehensive reflection of individual's attitudes, motivation, preferences, perception and other recessive factors, these conclusions were not comprehensive enough without taking personality traits into consideration. Psychological studies also showed that personality could help explain the attitudes and behaviors toward specific things, situations, or people. Currently, with the introduction of questionnaire design to test the risk tolerance, researchers proved that personality factors did have effect on risk perception. (Bouyer, et al., 2001)

Psychological Theories in Financial Risk Tolerance

A number of studies have investigated how psychological theories can be applied to

measure financial risk tolerance. Carducci and Wong (1998) described personality in terms of Type A and Type B categorical behaviors in their studies. A Type A behavior was thought to be characterized by "individuals who are hard driving and competitive, with an underlying tendency for hostility and aggressiveness", which they argued as the willingness to take financial risks. In another study, Bailard, Biehl, and Kaiser (1986) classified investors into five categories: adventurers, celebrities, individualists, guardians, and straight arrows. These classifications were based on two personality characteristics: careful versus impetuous, and anxious versus confident. Each category was shown to imply a different aspect of risk tolerance. Other measurements such as the Myers-Briggs Type Indicator (MBTI) was also used as an individual personality preference instrument (Filbeck, et al., 2005). Based on MBTI, the breakdown by dimension in the general U.S. population was approximately:

•	Extroverted (E)	75%
•	Introverted (I)	25%
•	Sensing (S)	75%
•	Intuitive (N)	25%
•	Thinking (T)	50%
•	Feeling (F)	50%

Mullet et al. (2001) also introduced three kinds of personality factors: anxiety factors, affective reaction/personal valuation factors. However, based on the different uses of psychological models as well as research methodology, different researchers had found inconsistent results regarding the relations between these personality factors and risk evaluation.

Cultural Differences in Perceived Risks

In one study of the cultural differences in risk preference, the research team led by Weber and Hsee measured and analyzed the buying prices for risky financial options of both Chinese and American investors. By assessing risk preferences in the traditional expected-utility framework,

they found out that Chinese respondents were significantly less risk-averse in their pricing than Americans (Weber and Hsee, 1998). The present study also suggested that a culture's position on the individualism-collectivism continuum seemed to contribute to the risk preferences of its members. Since most current studies were carried out in a western context and the evidence showed that the cultural differences played a role in individuals' preferences and attitudes towards riskiness, whether these past conclusions could also be applied to Chinese investors were still questionable. Based on these studies, we would like to have an in-depth study on the financial risk tolerance of Chinese investors with the goal to research on the correlational relations between psychological factors in personality traits and financial risk tolerance of Chinese investors.

Big Five Personality Traits Theory and the Sub-dimensions

In the 1990s, two research teams led by Paul Costa and Robert R. McCrae of the National Institutes of Health and Warren Norman and Lewis Goldberg of the University of Michigan at Ann Arbor and the University of Oregon, respectively, discovered that most human character traits could be described using five dimensions. The personality traits used in the 5-factor model are Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to experience. Because, for example, humans are essentially a social species, we can view variation on the five dimensions as answers to fundamental social questions: "who is good company (Extraversion), who is kind and supportive (Agreeableness), who puts in sustained effort (Conscientiousness), who is emotionally undependable (Neuroticism), and who has ideas that pan out (Openness to experience)" (Bouchard & Loehlin, 2001). Table 1 shows the detailed definition of each dimensions of Big Five Theory. Paunonen and Ashton (2001) extended the existing theories of Big Five personality traits and extended the five dimensions into sub-dimensions, which could be used as the facet scales of these five big dimensions.

Table 1
Big Five Personality Traits and the Descriptions

Traits	Description	Score Low	Score High
Openness	Imagination, Feelings, Actions, Ideas	Practical, Prefer Routine, Conventional	Curious, independent, wide range of interests
Conscientious -ness	Competence, Self-discipline, Goal-driven, Thoughtfulness	Impulsive, Careless, Disorganized	Hardworking, Organized, Dependable
Extraversion	Sociability, Assertiveness, Emotional Expression	Quiet, Reserved, Withdrawn	Outgoing, Warm, Seek Adventure
Agreeableness	Cooperative, Good-natured, Trustworthy,	Critical, Suspicious, Uncooperative	Optimistic, Helpful, Trusting, Empathetic
Neuroticism	Tendency towards Unstable Emotions	Calm, Secure, Eventempered	Anxious, Unhappy, Prone to Negative Emotions

In this paper, I would introduce Big Five personality traits theory as well as the 13 sub-dimensions as the main measurements of the personality traits. Table 2 shows the 13 sub-dimensions that were chosen as the possible indicators of financial risk tolerance in this study. With the assumption that the level of financial risk tolerance would be impacted by individuals' personal traits, we expected to find the statistical results to correlate personality traits with the level of financial risk tolerance of Chinese investors.

Table 2

Big Five Personality Traits and their Sub-dimensions

Dimensions	Sub-dimensions
Agreeable	Arrogant Aggression
Openness	Tolerance Curiosity
Neuroticism	Risk Taking Anxiety Stability
Extraversion	Introversion vs. Extraversion Interpersonal Relationships Dominance
Conscientiousness	Order Responsibility Deceptive

Methodology

Hypotheses

Inconsistency between real-life financial decisions and perceived risk tolerance exists in the financial behaviors of individual investors in China.

Significant correlational relations will be found between the sub-dimensions of Big Five personality traits theory and the level of financial risk tolerance.

Study Design

The research sample was conducted by surveying the individual investors with various levels of investment experiences. In this study, we designed to use questionnaires as the main method of data collection. The reason for this study design was based on the evidence from past studies that questionnaire was one of the most effective ways to measure financial risk tolerance. Also, since financial risk tolerance was defined as a multi-dimensional psychological feeling in this paper, using questionnaires would be the best way to help us reveal the recessive parts such as attitudes and emotions.

The questionnaires were distributed as hardcopies, and the chosen participants were volunteers from various age ranges and employment history that had some past experiences of financial behaviors. The questions were well-designed based on psychological theories and financial situations that were introduced and developed in past studies.

During the data collection process, 300 questionnaires were sent out and more than 260 responses were collected. Among these responses, 233 responses were identified as the valid questionnaires (78.6%). There were 107 female participants and 120 male participants (6 participants left it empty), and the age range is from 21 to 69 with the majority in 25 - 35.

Questionnaire

The questionnaire was designed to contain two parts of questions with total number of 112 questions that will be used to measure the level of the financial risk tolerance as well as the personality traits based on the Big Five personality traits. (Appendix)

Part I: Financial Risk Tolerance

For the first part, 15 questions were introduced to measure financial risk tolerance of individual investors. The first 14 questions were multiple choices and the last one was a fill-in blank question. The questions were designed from three dimensions with the intention to test the risk tolerance level from individuals' past investment behaviors, future expected investments as well as their self-perception in risky situations. The sample question would be like: "If you made an investment of 500,000 RMB, by how much could the total value of all your investments go down before you would begin to feel uncomfortable?". In the original design, the 15th fill-in blank question asked about participants' perception of their own financial risk tolerance. Since a lot of participants chose not to answer and left the answer blank, the results of this question were not used in the following analysis. By summing up the scores of the first 14 questions, each individual will get a total score on his level of financial risk tolerance.

Part II: Big Five Personality Traits Theory

For the second part of the personality study, the original design contained 112 questions related to personality traits. With the application of explorative factor analysis and t-test, 15 questions were found to have insignificant relations or have negative impact to the overall reliability and validity of each dimension. Thus, these 15 questions were eliminated in the correlational study and the remaining 97 questions were used for further analysis. These 97 questions were chosen from 5 general dimensions of personality (extraversion, agreeableness,

openness, conscientiousness, and neuroticism) and also fitted in 13 sub-dimensions within five broad dimensions.

The questions were measured with the scale from "Strongly Disagree" to "Strongly Agree". For half of the questions that were positively keyed, "Strongly Disagree" was keyed as 1 and "Strongly Agree" was keyed as 5. The other half negatively keyed questions had the opposite rating scale. The questions were designed in this way to ensure the consistency of the information provided. The sample questions to test Responsibility dimension would be: "Q1: It is hard for me to make decisions." (Negatively keyed); "Q2: I will try my best to do everything I have promised." (Positively keyed). If inconsistent answers were shown in multiple questions, then the credibility of the responses would actually effect the validity and reliability of the study.

Results

Level of Financial Risk Tolerance of Chinese Investors

From the questionnaire answers of the financial risk tolerance, we first analyzed the demographic distribution of the participants (Table 3 and Table 4). Based on the Research Report on Chinese Individual Investors published by Shengzhen Stock Exchange (2018), the demographic distribution we had in this study was a relatively good match to the new investors in Chinese market with the features: a) 55.8% of new investors were under 30, b) half of new investors were female, c) investors under 30 had lowest scores on financial knowledge. Thus, we had reasons to believe that the sample of this study could be a good representation of the new investors in Chinese market who didn't have a relatively good understanding of their own risk preferences.

Table 3

Age Range of Questionnaire Participants

Age Range	N of Participants	Percentage (%)
20 - 25	46	19.7 %
26 - 30	77	32.9 %
31 - 35	61	26.1 %
36 - 45	40	17.1 %
≥ 45	10	4.3 %

Table 4

Gender Distribution of Questionnaire Participants

Gender	N of Participants	Percentage (%)
Male	107	47.1 %
Female	120	52.9 %

Figure 1 shows the results from the questions about past investment behaviors. From the bar chart, we found that there are about half of investors (44.4%) scored themselves as the ones who tended to be risk-averse in their past investments. The majority of participants believed they

had relatively low level of risk tolerance in their existing investment behaviors. Only a very small portion of participants (2.2%) showed strong preference to risk-taking behaviors in their past investments.

Figure 1. Distribution of Past Investment Behaviors

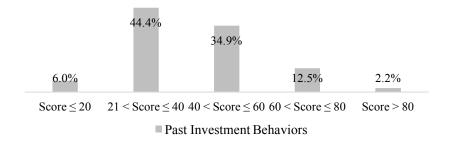
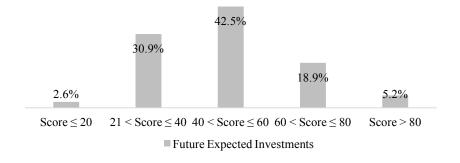


Figure 2 shows the results for future expected investments that indicates around half of participants (42.5%) tended to be risk-neutral for their future investments and were willing to take medium degree of risk. Around one third of the participants (30.9%) preferred to take relatively low risk investments, compared to 18.9% participants who were willing to choose risky investments.

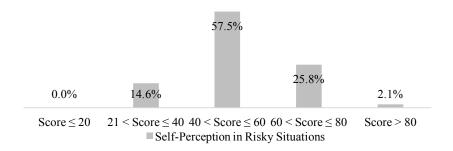
Figure 2. Distribution of Future Expected Investments



From figure 3, we found that for the distribution of self-perception in risky situations, 57.5% of participants preferred medium level of investment risks. There were more participants

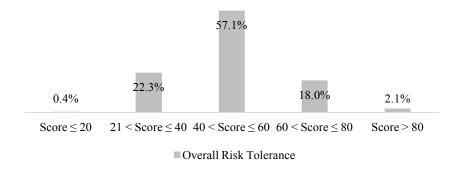
saw themselves as relatively risk-seeking (25.8%), compared to those see themselves as risk-averse (14.6%).

Figure 3. Distribution of Self-Perception in Risky Situations



Using data collected from these three dimensions, we got the distribution of overall risk tolerance for these participants (Figure 4). Based on the results, we could see that the overall risk tolerance of participants was roughly distributed normally. The majority of the participants (57.1%) still fitted in the category of medium level of risk tolerance.

Figure 4. Distribution of Overall Risk Tolerance



Correlational Relations between Financial Risk Tolerance and Personality Traits

Based on the questionnaire results, we introduced Cronbach's Alpha Test (Figure 5) and KMO and Bartlett's Test (Figure 6) to examine the reliability and validity of the collected data. Based on the analysis results, there was some significant inconsistency in the sub-dimensions of Anxiety ($\alpha = 0.42$), Stability($\alpha = 0.551$), Introversion vs. Extraversion($\alpha = 0.582$), Dominance ($\alpha = 0.554$) and Order($\alpha = 0.498$).

Figure 5. Formula of Cronbach's Alpha Test

$$\alpha = \frac{R}{R - 1} \left(1 - \frac{\sum \sigma_I^2}{\sigma_X^2} \right)$$

R = Number of items σ_I^2 = variant items σ_X^2 =total score variant

Figure 6. Formula of KMO and Bartlett's Test

$$KMO = \frac{\sum \sum_{i \neq j} r_{ij}^2}{\sum \sum_{i \neq j} r_{ij}^2 + \sum \sum_{i \neq j} \alpha_{ij}^2}$$

 r_{ij} = correlation between question i and j a_{ii} = partial correlation between question i and j

Before doing the correlational analysis with financial risk tolerance, we introduced Principle Component Analysis (PCA) as the extraction method to adjust the number of questions used in correlational tests. Based on the results of PCA, one question was taken out from each sub-dimension of Tolerance, Anxiety and Introversion vs. Extraversion. However, after the adjustment, the two sub-dimensions Stability($\alpha = 0.551$) and $Order(\alpha = 0.498)$ still showed relatively low validity and reliability with negative impact on the consistency of the dimensions they belonged to. So, based on the statistical results, these two sub-dimensions were not included in the correlation test. Table 5 presents the validity and reliability of each dimension after the adjustments.

The detailed information for the remaining 83 questions is shown in Table 6.

Table 5
Validity and Reliability of each dimension from Big Five

Dimensions	N of Items	Cronbach's Alpha	KMO and Bartlett's Test
Agreeable	18	0.833	0.871
Openness	12	0.733	0.769
Neuroticism	17	0.741	0.765
Extraversion	23	0.819	0.828
Conscientiousness	14	0.753	0.741

Table 6
Validity and Reliability of each sub-dimension after adjustments

Dimensions	Sub-dimensions	N of items	Cronbach's Alpha	KMO and Bartlett's Test
Agreeable	Arrogant	9	0.786	0.837
	Aggression	9	0.692	0.806
Openness	Tolerance	5	0.614	0.672
	Curiosity	7	0.644	0.738
Neuroticism	Risk Taking	9	0.667	0.77
	Anxiety	7	0.62	0.71
	Stability	5	0.551	0.592
Extraversion	Introversion vs. Extraversion	8	0.637	0.779
	Interpersonal Relationships	8	0.772	0.813
	Dominance	7	0.554	0.575
Conscientiousness	Order	6	0.498	0.712
	Responsibility	8	0.679	0.748
	Deceptive	6	0.676	0.705

By doing the correlational analysis between these 83 personality questions and the financial risk tolerance score of each individual, we found that 32 personality questions had strong correlational relations with individual's score of financial risk tolerance (sig. 2-tailed < 0.05). The results also indicated that the majority of these 32 questions were within 6 sub-dimensions, which

were Arrogant, Aggression, Curiosity, Risk Tolerance, Anxiety and Dominance. Table 7-12 show the questions that were significantly correlated with financial risk tolerance, as well as six sub-dimensions they belonged to. To determine whether the correlational results reflected the relations between each dimension and financial risk tolerance, we also considered the Pearson Correlation of each question and the results indicated the coefficients of those significant questions had the consistent signs within each sub-dimension.

Table 7

Correlational Relation, Significant Level between Questions from Arrogant and financial risk tolerance

Arrogant	Pearson Correlation With FRT	Sig. (2-tailed)	Sum of Squares and Cross-products
PTA16	.158*	0.016	361.206
PTA24	0.118	0.072	260.133
PTA25	-0.038	0.565	-68.343
PTA38	.136*	0.038	278.927
PTA39	0.125	0.056	199.262
PTA46	.199**	0.002	374.313
PTA73	.193**	0.003	366.717
PTA79	.188**	0.004	319.133
PTA95	0.065	0.320	125.189

^{**.} Correlation is significant at the 0.01 level (2-tailed)

Table 8

Correlational Relation, Significant Level between Questions from Aggression and financial risk tolerance

Aggression	Pearson Correlation	Sig. (2-tailed)	Sum of Squares and
	With FRT		Cross-products
PTA12	.191**	0.003	392.927
PTA23	.193***	0.003	365.086
PTA43	0.028	0.675	60.416
PTA56	0.039	0.551	87.85
PTA58	.169**	0.010	327.039

^{*.} Correlation is significant at the 0.05 level (2-tailed).

PTA89	.153*	0.019	273.137
PTA85	0.111	0.090	208.099
PTA82	0.054	0.410	111.013
PTA76	0.081	0.217	169.318

^{**.} Correlation is significant at the 0.01 level (2-tailed)

Table 9
Correlational Relation, Significant Level between Questions from Curiosity and financial risk tolerance

Curiosity	Pearson Correlation	Sig. (2-tailed)	Sum of Squares and
	With FRT		Cross-products
PTO04	.195**	0.003	429.691
PTO14	.291**	0.000	703.717
PTO31	0.074	0.261	144.953
PTO67	.156*	0.017	336.09
PTO91	.264**	0.000	551.403
PTO93	0.06	0.363	135.627
PTO94	0.071	0.281	171.725

^{**.} Correlation is significant at the 0.01 level (2-tailed)

Table 10

Correlational Relation, Significant Level between Questions from Risk Taking and financial risk tolerance

Risk Taking	Pearson Correlation	Sig. (2-tailed)	Sum of Squares and
	With FRT		Cross-products
PTN10	.234**	0.000	547.026
PTN13	.322**	0.000	692.468
PTN27	.272**	0.000	665.884
PTN29	.172**	0.008	345.876
PTN30	-0.076	0.250	-175.73
PTN47	.167*	0.011	349.206
PTN53	.152 [*]	0.020	340.472
PTN69	0.122	0.062	276.609
PTN80	.157*	0.016	338.961

^{**.} Correlation is significant at the 0.01 level (2-tailed)

^{*.} Correlation is significant at the 0.05 level (2-tailed).

^{*.} Correlation is significant at the 0.05 level (2-tailed).

^{*.} Correlation is significant at the 0.05 level (2-tailed).

Table 11 Correlational Relation, Significant Level between Questions from Anxiety and financial risk tolerance

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Anxiety	Pearson Correlation With FRT	Sig. (2-tailed)	Sum of Squares and Cross-products
PTN21	.236**	0.000	556.459
PTN32	.161*	0.014	363.944
PTN42	0.097	0.139	199.451
PTN55	.199**	0.002	337.888
PTN66	0.117	0.075	231.433
PTN74	-0.042	0.524	-97.464
PTN90	-0.046	0.481	-107.202

^{**.} Correlation is significant at the 0.01 level (2-tailed)

Table 12

Correlational Relation, Significant Level between Questions from Dominance and financial risk tolerance

Dominance	Pearson Correlation With FRT	Sig. (2-tailed)	Sum of Squares and Cross-products
PTE01	0.022	0.736	54.755
PTE05	.185***	0.005	365.845
PTE17	-0.012	0.852	-24.159
PTE28	.147*	0.025	312.73
PTE49	.360***	0.000	764.391
PTE71	-0.041	0.533	-92.562
PTE86	.279**	0.000	627.948

^{**.} Correlation is significant at the 0.01 level (2-tailed)

^{*.} Correlation is significant at the 0.05 level (2-tailed).

^{*.} Correlation is significant at the 0.05 level (2-tailed).

Discussion and Conclusion

This study suggests that this questionnaire design is a good measure of individuals' personality traits and financial risk tolerance. The results show that the collected data have relatively high reliability and validity in most dimensions. The questionnaire design of 14 financial risk tolerance questions and 97 personality questions helps eliminate the bias effectively with more than 77% valid responses. By cross-matching the research sample in the study with the government report on the new investors of Chinese market, we believe that our sample is a good representation of the new Chinese investors who might have difficulty in estimating their levels of risk tolerance. Also, since the results from overall risk tolerance are roughly normally distributed with the majority (57.1%) of investors have medium level of risk tolerance, it reflects from the other side that our sample has captured the group of individual investors from different preference levels.

The results from the level of risk tolerance of Chinese investors indicate that investors show the tendency of risk-averse behaviors in their past financial investments. However, the future expected investments suggest that the majority of the investors will prefer to take medium and even relatively high level of risk for their future investments. There might be several possible reasons for this increase in the level of risk tolerance. One explanation is that these Chinese investors have positive attitudes towards the financial market in China and are willing to take more risks for future investments. On the other hand, another possible reason for this inconsistency in risk preferences might be that these investors actually hold a wrong belief of the level of financial risk they have taken in their past investments and become over-optimistic about their risk tolerance.

This possible misunderstanding of level of risk tolerance is also reflected in the analysis on self-perception in risky situations. The results of self-perception also suggest that more than half of the investors (57.5%) see themselves as risk-neutral and willing to take medium level of

investment risk. However, the results also indicate that the overall scores of risk tolerance from self-perception are even higher than those of future expected investments. Here, more investors are willing to have relatively risky investments (25.8%), compared to relatively safe ones (14.6%). The comparisons among investment behaviors and self-perception also indicate how investors will tend to overestimate their risk preferences and choose the investments that go beyond their risk tolerance.

Besides the distribution of financial risk tolerance of Chinese investors, this study is also one of the first study to correlate financial risk tolerance of Chinese investors with their personality traits. This study shows that the sub-dimensions related to Arrogant, Aggression, Curiosity, Risk Taking, Anxiety and Dominance have significant correlational relations with the level of financial risk tolerance. This study converges with the notion that individual investors tend to act "normal" instead of "rational" when making financial decisions (Filbeck, et al., 2005). The results prove that the decision-making for Chinese investors are heavily impacted by their value systems and especially some aspects of their personality traits.

The sub-dimension of Arrogant indicates people with lower level of abasement and higher level of aggression will tend to become more risk-seeking and have higher level of financial risk tolerance. Similar patterns are also found in Aggression, which show that investors with higher level of achievement-oriented motivation will show higher level of financial risk tolerance compared to those who tend to avoid the pressure of achieving goals. These two sub-dimensions belong to the big dimension of Agreeable. The results from this study are also consistent with the findings from past research that agreeableness are significantly negatively correlated with financial risk tolerance (Pinjisakikool, 2017).

The sub-dimension of Curiosity indicates the relatively strong correlational relations

between individuals' willingness to try new things and their level of financial risk tolerance. It reflects that fact that investors who are open to different options are more likely to make bold and risky investment choices. On the other hand, those investors who have strong conservative personalities are more willing to stay on the safe side and have less risky investment decisions.

Another obvious result is that the sub-dimension of Risk Taking also correlates to the individuals' level of risk tolerance. The study proves that investors who love challenges and have risk-taking behaviors in daily situations will show the similar behavior patterns in their financial investment decisions. Anxiety, as another sub-dimension of Neuroticism, is the only significant sub-dimension that is negatively correlated with the level of financial risk tolerance. The results show that individuals with higher level of anxiety will prefer to take lower level of risk in investments. Our findings are consistent with the study of Bouyer et al. (2001) that anxiety factors will have significant effect on individual's risk perception.

The last sub-dimension that is found to be significant is Dominance, which shows that individuals who are more determined in their own opinions are more willing to take risks. The reason behind this finding is because these individuals are likely to stick to their own decisions and want to prove to others that they have complete control over their own choices.

Our discussion at this point proves that the correlational relations exist between personality traits and level of financial risk tolerance. It also raises the possibilities that other personality traits, not limited to Big Five Theories and the sub-dimensions, might be studies in the future to see their relations with financial risk tolerance.

Limitation and Further Study

One limitation of this study is that the study design with questionnaire data have the constraints of sampling biases. Even though the age range of participants is from 21-69 (M=31.65) and the participants are chosen from various industries, the sampling group in this study is still a convenient sample that might be biased. Another limitation will be the construct-validity bias from the questionnaire design. This questionnaire is designed with 97 personality questions with the goal to increase internal reliability and validity. However, since there is strong inter-dimension correlational impact among each dimension, there is still not enough evidence to show that all these 97 questions can accurately value each personality dimension.

For the further study, the measures of regression relations should be introduced to test the correlational relations from a more comprehensive perspective. Beside, if the questionnaire study is still introduced in the further study, we need to look for a larger sample size that map the real-life demographic distribution of investors more accurately. Another point to improve is that further study can also get into more detailed analysis of each sub-dimension and try to study on other possible relations beyond the correlational relations.

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Appendix

Questionnaire

Thank you for taking this Questionnaire! The aim of this questionnaire is to understand some basic behavioral traits and characteristics of the public. The results will only be used for academic purposes and there are no right or wrong answers for the questions. Please answer all the questions by circling one of the options. Choose the option that best indicates how you feel about each question. If none of the options is exactly right for you, choose the option that is closest.

Part I: Risk Tolerance

- 1. How would you rate your willingness to take financial risks?
 - a. Extreme low risk taker
 - b. Very low risk taker
 - c. Low risk taker
 - d. Average risk taker
 - e. High risk taker
 - f. Very high risk taker
 - g. Extreme high risk taker
- 2. If you made an investment of 500,000 RMB, by how much could the total value of all your investments go down before you would begin to feel uncomfortable?
 - a. Any fall will make me feel uncomfortable
 - b. 0 50,000 RMB
 - c. 5 100,000 RMB
 - d. 100,000 150,000 RMB
 - e. 15,000 20,000 RMB
 - f. More than 20,000 RMB
- 3. In the past, what degree of risk have you ever taken with your investment decisions?
 - a. Very small
 - b. Small
 - c. Medium
 - d. Large
 - e. Very large
- 4. In recent years, how have your personal investments changed?
 - a. Always towards low risks
 - b. Mostly towards low risks
 - c. No changes with clear direction
 - d. Mostly towards high risks
 - e. Always towards high risks

- 5. When you think of the word "risk" in a financial context, which of the following words comes to mind first?
 - a. Danger
 - b. Uncertainty
 - c. Opportunity
 - d. Thrill
- 6. If you had to make a choice, would you pick more job security with a small pay increase or less job security with a big pay increase?
 - a. Definitely more job security with a small pay increase
 - b. Probably more job security with a small pay increase
 - c. Not sure
 - d. Probably less job security with a big pay increase
 - e. Definitely less job security with a big pay increase
- 7. How much confidence do you have in your ability to make good investment decisions?
 - a. Very small
 - b. Small
 - c. Medium
 - d. Large
 - e. Very large
- 8. Despite your mortgages, what were the greatest leverage ratio of investment you have in the past?
 - a. 0
 - b. 0.2
 - c. 0.5
 - d. 1
 - e. 1.5
 - f. more than 2
- 9. If your financial situation got worse, to which level your life would be impacted?
 - a. Very large
 - b. Quite large
 - c. Ouite small
 - d. Very small
- 10. Have you ever invested a large amount of money into some speculative investment?
 - a. No
 - b. Yes, very rarely
 - c. Yes, somewhat rarely
 - d. Yes, somewhat frequently

- e. Yes, very frequently
- 11. What were the average rate of return would you expected compared to Yu'ebao (4% annually)?
 - a. About the same as Yu'ebao
 - b. About 1.5 times the rate from Yu'ebao
 - c. About 2.0 times the rate from Yu'ebao
 - d. About 2.5 times the rate from Yu'ebao
 - e. About 3.0 times the rate from Yu'ebao
 - f. More than 3.0 times the rate from Yu'ebao
- 12. What degree of risk are you willing to take for your future investment decisions?
 - a. Very small
 - b. Small
 - c. Medium
 - d. Large
 - e. Very large
- 13. If you made an investment of 500,000 RMB, by how much could the total value of all your investments go down before you would sell your investments?
 - a. 0 50,000 RMB
 - b. 5 100,000 RMB
 - c. 100,000 150,000 RMB
 - d. 15,000 20,000 RMB
 - e. 20,000 25,000 RMB
 - f. More than 20, 000 RMB
- 14. If you currently have 500,000 RMB for investment, which mix of investments do you find most appealing?
 - (H—High Risk/Return; M—Medium Risk/Return; L—Low Risk/Return)
 - a. H 0%, M 0%, L 100%
 - b. H 0%, M 30%, L 70%
 - c. H 10%, M 40%, L 50%
 - d. H 30%, M 40%, L 30%
 - e. H 50%, M 40%, L 10%
 - f. H 70%, M 30%, L 0%
 - g. H 100%, M 0%, L 100%
- 15. What do you think your score of financial risk preference will be? (With the scale of 0 to 100, and 100 indicates the highest level of risk preference)

Part II: Behavioral Traits

Questions	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
1. I don't want to be responsible for others.					
2. I see myself as an energetic person.					
3. I don't have any close friends.					
4. I will proactively explore the unknown.					
5. My opinions and ideas cannot have impact on others.					
6. I will try to do the best for everything.					
7. I love taking tasks that can be finished individually without teamwork.	0	0		0	
8. I am good making plans for my tasks and keeping track of the process.					
9. If possible, I prefer not to take responsibility.					
10. I can accept the uncertainty of the future.					
11. I am an outgoing person with optimistic characteristics.		0		0	
12. I will be attracted by challenging tasks.					
13. I want to find a job with great stability.					
14. I am a conservative person.					
15. I have control over my temper even when I am faced with provocation from others.					
16. I don't have many things that I feel proud of.					
17. I have control over my life.					
18. I always think reflectively.					
19. I always participated in various activities.					
20. Sometimes I don't see myself as a reliable person.					
21. I try to avoid job transfer.					
22. I think we can cross the road whenever there is not vehicle on the road.					
23. I feel motived and challenged in the situations that test my abilities.					
24. In general, I see myself as a loser.					
25. I can finish the tasks as well as most people do.					
26. I can determinedly make decisions.					
27. I love to participate in thrilling activities.					
28. I have difficulty in sticking to my opinions when other					

Questions	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
people disagree.					
29. I love to take challenges.					
30. Compared to having creative ideas, I think it is more important to be practical.					
31. I am a person with strong imagination and curiosity.					
32. I need a large amount of time to feel comfortable with the new environment.					
33. I rarely feel upset.					
34. I am willing to share my own thoughts with others.					
35. I think that past experiences are more important than the new attempts.	0	0		0	
36. I sometimes choose to go against moral standards when there is no other people.					
37. I will follow the rules even when there are no legal restrictions.					
38. I am a unique and charming person.					
39. I always look for self improvement.					
40. I don't want to follow the rules.					
41. I always feel overwhelmed.					
42. I have great control of my temper.					
43. I will feel anxious if there is something I can't handle.					
44. I feel it is hard for me to make some decisions.					
45. I am a person with great tolerance.					
46. I believe I can succeed as long as I try my best.					
47.I feel excited about the competitions.					
48. Many people see me as an a person with great distance.					
49. I can ask other people to do what I want them to do.					
50. I understand the existence of things with different values.					
51. I try to avoid some social activities.					
52. I will insist on finishing every task.					
53. I wish to have a stable life.					
54. I can forgive the mistakes that others have made.					
55. I can get used to a new environment in both my daily and career life.	0	0			

Questions	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
56. I don't like the situations that intend to test my abilities.					
57. It is hard to change my existing judgments.					
58. I cannot take the consequences of failure.					
59. I will not talk to anyone when I am upset.					
60. I smile a lot during my daily life.					
61. I always feel regret of what I have done.					
62. I try my best to finish all the assigned tasks.					
63. I love to be around by my friends.					
64. I work hard to reach my goals.					
65. I am an active person in a team.					
66. I can face the difficulties with placid manner.					
67. I hold questions for a lot of things.					
68. I never go against the traffic rules.					
69. I prefer not to take risks.					
70. I can remain unflappable in a difficult situation.					
71. Others' problems have nothing to do with me.					
72. I prefer to stay alone.					
73. I am extraordinary in many perspectives.					
74. I am not someone who will worry a lot.					
75. I will try to keep my things neat and tidy.					
76. I will not try things without clearly knowing the consequences.					
77. I will make a detailed plan before doing anything.					
78.People see me as an impetuous person with bad temper.					
79. In general, I am pleased with my life.					
80. I have a fast-paced lifestyle.					
81. I understand the existence of things with different values.	0	0		0	0
82. I am not willing to do the tasks that might not succeed.					
83. I have strict demands on myself.					
84. I will do whatever I have promised.					

Questions	Strongly Disagree	Disagree	Not Sure	Agree	Strongly Agree
85. I feel happy when I am working on a challenging task.					
86. I usually work as a team leader in the team.					
87. Sometimes I want to be away from the public and stay alone.		0			
88. I think we must follow the moral disciplines.					
89. I would love to take difficult tasks.					
90. I always feel overwhelmed.					
91. I want to make myself look unique.					
92. I love to talk to others.					
93. I don't care about things that happen around me.					
94. I show no interests in exploring different things.					
95. I am proud of the abilities and skills I have.					
96. I don't usually talk about my Aggressions.					
97. I am an indecisive person.					