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An Investigation of Impact of Personality Traits using OCEAN as a Personality Test and Crypto Market Participation in Kolkata

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ABSTRACT

This research adds to the body of knowledge on cryptocurrency market involvement. It is the first work to use survey data from Kolkata to examine the connection between personality factors and participation in the cryptocurrency market. There were 866 participants in total, 261 of them were involved in the cryptocurrency market. The Big Five (OCEAN) — openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism—are used to describe the personality traits. Both openness to experience and neuroticism are revealed to have a substantial negative connection with participation in the cryptocurrency market. The remaining three personality qualities show little association with one another.

Key Words: Personality traits, Crypto market, Big Five, Cryptocurrency

Introduction:

Digital currency is more than just a credit card number used for online shopping. Digital currencies and cryptocurrencies are examples of digital currencies. Because it is a relatively new area, defining individual terms, particularly their legal personality, is extremely difficult.

Cryptocurrencies are widely used. This is a type of digital currency that uses cryptography to secure transactions and control the issuance of new currency units. The main feature of cryptocurrencies is their decentralisation, which contrasts with traditional digital currencies that are controlled centrally by governments or other institutions, as well as traditional physical money. Neither the production of units of the respective currency nor the price of the currency can be influenced in this way by a single entity, as is the case with central bank interventions. Currency issuance, on the other hand, occurs collectively across the entire system of the given cryptographic, and the rate of issuance of new currency units is defined with the system's origin and is publicly known. In general, new coins are created in such a way that their value decreases over time until they represent the circulation of the entire, pre-programmed, and publicly known number of coins. Transparency is another feature of cryptocurrencies. This is because of the use of a public database known as a blockchain. This database records all network transactions, and the database itself serves as a public accounting book that is constantly under public control, allowing unauthorised users' transactions to be prevented. Because of the blockchain, each user can view any transaction that occurred in the network at any time, as well as determine how much digital currency was sent to which address.

In practice, the technology works like any computer connected to a distributed node network, it has a copy of the blockchain that synchronizes with its copies users and each new transaction that users make is recorded in the string of previous transactions, respectively. a series of transactions creates a so-called block that is then grouped into a string of blocks. Such entry can no longer be changed because of the individual blocks in the string refer to the previous block, and it is also necessary to change the data in the previous blocks. There are currently over 1620 different cryptocurrencies with open-source code, and anyone can create their own currency with specific parameters; 21 of them have market capitalizations in excess of a billion dollars. Bitcoin is the most well-known, widely used, and oldest decentralised cryptocurrency; however, its main shortcoming in becoming a truly global payment system is its low transaction throughput. Now, some new ideas for increasing transaction throughput, with varying system scalability, and a new generation of cryptocurrencies have emerged.

Traditional finance theories hold that most individual investors make rational financial decisions, that is, they do not let their emotions influence their decisions (Vidya, 2021). However, emotions appear to play a role in people's general decision-making, and people's reactions to this vary (Ahn & Kim, 2021). Cryptocurrencies are known for their high volatility, with price drops of up to 20% occurring frequently within hours. Because of this, some people decide to sell. Others react differently; they do not panic and may even buy more. Previous research found a link between an individual's personality traits and general and investment decision making. (El Otman et al., 2020; Chitra & Sreedevi, 2011).

However, as far as we know, no research has been conducted on the possible relationship between personality traits and cryptocurrency investment decisions in Kolkata. As a result, this study will concentrate on the relationship between personality traits and individual decisions about crypto market participation. The findings could be beneficial to individual investors if they become more aware of their own personality traits and the impact this may have on their decisions. By understanding the benefits and drawbacks of their personality traits, they should be better able to deal with the drawbacks and make more informed decisions when investing in cryptocurrencies.

There has been some previous research on why people enter the stock market, such as Kaustia and Knüpfer (2012) and Blaurock et al (2018). However, as far as we know, no prior research has been conducted on the potential relationship between personality traits and the decision to enter the cryptocurrency market. Trading cryptocurrencies has grown in popularity among people of all ages (Hasso et al., 2019). An individual may invest in cryptocurrencies for a variety of reasons. For example, they distrust the government, and cryptocurrencies are decentralised, or they are afraid of missing out (Martin et al., 2022). A lot of young people also buy cryptocurrencies in the hope of making easy money. The extreme volatility of cryptocurrency prices may attract different types of investors than stocks and bonds (Baur & Dimpfl, 2021). The purpose of this study is to convey the perspective of the average investor in the Kolkata crypto market. The following is an example of a research question: 'Which personality traits are important in cryptocurrency investing?'

The study is carried out as follows. It employs a survey to determine the respondent's personality traits, as well as personal information that will be used as control variables and information about cryptocurrency market participation. Multiple logistic regressions will be run on this data to investigate the relationship between personality traits and crypto market participation. The findings indicate a significant opposite relationship between two personality traits and crypto market participation, namely neuroticism and openness to experience.

Literature overview

Traditional finance theories assume that individual investors make rational decisions, that is, that they do not let their emotions influence their decisions (Vidya, 2021). People, on the other hand, do not always act rationally. Behavioural economics is a branch of economics that studies how people actually behave rather than how they would behave if they were perfectly rational (Thorgeirsson & Kawachi, 2013). Simon Herbert coined the term "bounded rationality" in 1995 to describe humans' problem-solving abilities.

Individuals' investment decisions are influenced by behavioural biases. Overconfidence, the disposition effect, herding effect, endowment effect, and loss aversion are some examples. When people are overconfident, they are overly optimistic about trading outcomes and believe they can make sound investments based on the information they have (Zahere & Bansal, 2018). According to the disposition effect, investors tend to sell stocks early in order to realise gains and to hold losing stocks in order to postpone losses (Shefrin & Statman, 1985). In the financial market, herding refers to the tendency to follow other investors rather than think for oneself (Banerjee, 1992).

The endowment effect demonstrates that people place too much emphasis on what they currently own, as a result of which they are unwilling to change their position and may miss out on excellent investment opportunities (Kahneman et al., 1990). Finally, loss aversion is a bias in which investors value gains and losses differently. Because people are more sensitive to decreases in their well-being than increases, they value losses more than profits (Benartzi & Thaler, 1995). These behavioural biases cannot be taken into account due to the time constraints of this study. It would be interesting to include these variables in future research.

Shehhi investigated factors influencing cryptocurrency selection, which is similar to our research in some ways, but our sample is much larger, our analysis includes personal traits, and we used multivariate rather than bivariate testing.

The Five Factor Model (OCEAN), which consists of openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism, is one of the most widely used assessment tools for personality traits (Johnsi & Sunitha, 2019). Previous research supports the model's comprehensiveness and cross-cultural applicability (McCrea & John, 1992). Personality traits influence an individual's decision-making (Othman et al., 2020). Emotions also appear to play a role in individuals' general decision-making (Ahn & Kim, 2021), and emotional decisions lead to irrational thinking and may cause anomalies in financial markets (Vidya, 2021). According to research, an individual's personal characteristics influence their behaviour, risk perception, and willingness to make risky decisions (Akhtar & Das, 2019). As a result, it is possible that investor behaviour and decisions are influenced by personality traits. An individual's score on these five personality traits can be measured using a questionnaire based on certain personality trait characteristics.

However, there is a scarcity of literature focusing on cryptocurrency users, particularly on their psychological profiles or personality traits - which is what our paper aims to address.

Hypothesis

Based on previous research and the characteristics of the personality traits, a hypothesis is generated for each personality trait.

H_{o1}: 'There is a positive relationship between this person's level of openness to experience and the likelihood that this person will participate in the cryptocurrency market.'

H_{A1}: 'There is a negative relationship between this person's level of openness to experience and the likelihood that this person will participate in the cryptocurrency market.'

H_{o2}: 'There is a positive relationship between this person's level of conscientiousness and his or her likelihood of participating in the cryptocurrency market.'

H_{A2}: 'There is a negative relationship between this person's level of conscientiousness and his or her likelihood of participating in the cryptocurrency market.'

H_{o3}: 'There is a positive relationship between this person's level of extraversion and his or her likelihood of participating in the cryptocurrency market.'

H_{A3}: 'There is a negative relationship between this person's level of extraversion and his or her likelihood of participating in the cryptocurrency market.'

H_{o4}: 'There is a positive relationship between this person's level of agreeableness and his or her likelihood of participating in the cryptocurrency market.'

H_{A4}: 'There is a negative relationship between this person's level of agreeableness and his or her likelihood of participating in the cryptocurrency market.'

H_{o5}: 'There is a positive relationship between the level of neuroticism and the likelihood that this person will participate in the crypto market.'

H_{A5}: 'There is a negative relationship between the level of neuroticism and the likelihood that this person will participate in the crypto market.'

Research Methodology:

This study makes use of data that was collected through survey. The survey wass used to collect data, and it can be completed by anyone between the ages of 18 and 29. The survey is divided into three sections. In the first section, personal information such as age, gender, employment, level of education, and marital status will be collected (Othman et al., 2020; Chitra & Sreedevi, 2011; Conlin et al., 2015). The second section assesses the respondent's personality traits. Brown and Tayler's short 15-item personality test is used to determine the respondents' personality traits (2014).

The main reason for using the 15-item test rather than the 60-item test from Costa and McCrae (1992) is that a longer survey will almost certainly result in fewer respondents. Aside from that, the shorter test has acceptable levels of reliability and validity and adequately captures the personality domains (Hahn et al., 2012). Questions about investing in cryptocurrencies were asked at the end of the survey. For example, if they currently hold cryptocurrencies, how long ago they began investing, and why.

The information was gathered between January 5 and February 1 of 2023. In total, 916 people began the survey. However, 50 people did not complete the survey, resulting in a total of 866 people in the final dataset, with 393 females and 473 males.

Dependent variable

Participation in the cryptocurrency market is the dependent variable (CMP). This indicates whether or not this person is participating in the crypto market, or if he or she is holding any cryptocurrencies at the time. This is a binary variable which has the value of 1 if that person is currently holding any cryptocurrencies, and a value of 0 otherwise.

Independent variables

The five personality traits that comprise the independent variables are conscientiousness, extraversion, agreeableness, neuroticism, and openness to experience. The 15-item personality test is used to determine the scores on the personality traits.

Descriptive statistics

Table 1 displays the descriptive statistics of the dataset divided into two groups, one for individuals who participate in the crypto market and one for those who do not.

Table 1 : Descriptive statistics of the variables

VARIABLES	CMP No N	mean	sd	min	max	CMP Yes N	mean_1	sd_2	min_3	max_4
Conscientiousness	605	5.318	0.943	3	7	261	5.171	0.942	2	6
Extraversion	605	5.186	1.071	1	7	261	5.212	0.980	2	7
Agreeableness	605	5.343	0.905	1	7	261	5.411	0.873	3	7
Neuroticism	605	4.311	1.265	2	7	261	3.491	1.253	1	6
Openness	605	4.467	1.101	2	7	261	4.106	1.190	2	7

Source: Author own calculations

SPSS was used to analyse the data. The potential relationships between personality traits and cryptocurrency investing were investigated using regression analysis. The dependent variable is whether or not they participate in the cryptomarket, which is measured with a dummy variable. A logistic regression will be used to regress the dummy variable, as Conlin et al. (2015) did when they studied personality traits and stock market participation.

Following assumptions for a logistic regression was taken into consideration.

1: The dependent variable must be of the binary type. Because the dependent variable, crypto market participation, has a value of 0 or 1, this assumption is met.

2: Observations are independent from each other. Since the observations are from a random sample, and people were allowed to only participate once, this assumption is most likely met.

3: No multicollinearity between explanatory variables. To test for this the Variance Inflation Factor is used:

Variance inflation factor. There are no alarmingly high scores for the explanatory variables, so this assumption is met.

Table 2: Variance inflation factor

Control Variables & Dependent Variables	Variance inflation factor	Inverse of Variance inflation factor
Age	3.469	.288
Marital	2.703	.37
Income	1.766	.566
Neuroticism	1.634	.612
Gender	1.505	.664
Risk	1.293	.773
Conscientiousness	1.281	.781
Employment	1.234	.81
Education	1.227	.815
Agreeableness	1.158	.863
Extraversion	1.13	.885
Openness	1.065	.939
Mean VIF	1.622	.

Source: Author own calculations

4: There are no extreme outliers. Looking at the descriptive statistics table there are no extreme minimum or maximum scores on the variables.

5: There is a linear relationship between explanatory variables and the logit of the response variable. To test this assumption, the Box-Tidwell test is used:

Table 3: Box-Tidwell test

Dependent Variables	P-Value
Conscientiousness	P = 0.919
Extraversion	P = 0.416
Agreeableness	P = 0.899
Neuroticism	P = 0.976
Openness to experience	P = 0.256

Source: Author own calculations

Since all p-values are >0.05, all independent variables are linearly related to the logit of the outcome variable and the assumption is satisfied.

6: The sample size is sufficiently large. Since the total number of respondents is 866, the assumption is met.

Results & Discussion

Table 4 shows the outcomes of the simple logistic regressions for each personality trait. The findings indicate a link between two personality traits and crypto market participation, namely neuroticism and openness to new experiences. There is a significant negative relationship between neuroticism and crypto market participation at the 1% level. Furthermore, there is a 10% significant negative relationship between openness to experience and crypto market participation. There is a small negative relationship between conscientiousness, a small positive relationship between extraversion, and a small positive relationship between agreeableness and crypto market participation. However, none of these relationships are statistically significant at 10% or higher. The simple logistic regressions show that there is a significant relationship between two personality traits and crypto market participation.

Table 4: Simple logistic regression of each personality trait with crypto market participation as dependent variable, combined in one table.

Variable	CMP	CMP	CMP	CMP	CMP
Openness	-0.281* (0.144)				
Conscientiousness		-0.0880 (0.171)			
Extraversion			0.044 -0.157		
Agreeableness				0.044 -0.157	
Neuroticism					-0.518*** (0.136)
Constant	-0.0832 (0.907)	-0.772 -0.833	-0.657 -1.004	1.634*** (0.558)	0.693 (0.647)
Observations	866	866	866	866	866

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Source: Author own calculations

Table 5 shows a logistic regression with crypto market participation as the dependent variable and all five personality traits as the independent variables to see what the combined effects of the personality traits are. This regression shows that there is still a negative relationship between neuroticism and crypto market participation at the 1% level, as well as a negative relationship between openness to experience and crypto market participation at the 5% level. In contrast to the separate regression, conscientiousness now shows a significant negative relationship with 10% crypto market participation. Extraversion and agreeableness still have a (small) positive relationship, but it is not significant.

Table 5: Logistic regression with crypto market participation as dependent variable, and all personality traits as independent variables.

Variables	CMP
Openness to experience	-0.384*** (01.64)
Conscientiousness	-0.367 * (0.204)
Extraversion	0.0287 (0.181)
Agreeableness	0.141 (0.219)
Neuroticism	-0.643*** (0.151)
Observations	866

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Source: Author own calculations

According to the findings, both openness to experience and neuroticism have a significant negative relationship with cryptocurrency market participation. The remaining three personality traits have little in common with one another.

Conclusions

The purpose of this conference paper was to investigate the impact of personality traits and demographics on cryptocurrency usage. So far, this new technology has not been investigated in terms of user motivation, and we have (correctly) assumed that personality traits and demographics could be an interesting explanatory variable.

People who are more open to new experiences are more likely to use cryptocurrencies. As a new technology, it is obviously appealing to "early adopters" because it demonstrates their open mind and technological abilities. Cryptocurrencies are on the same path to mass adoption as other technologies (mobile phones, social media, and the internet), which were also pioneered by geeks.

When it comes to technology use, the majority of studies where gender is significant show that men use it more, which confirms our findings. The final finding can be interpreted as more people with more money adopting cryptocurrencies. The simple explanation is that many people regard cryptocurrencies as an interesting (though risky due to high volatility) investment tool, so people with regular income may be more interested in them.

This research, of course, has limitations. To begin with, the number of respondents is insufficient to form a reliable picture of the average crypto investor, but it can be viewed as a good starting point for future research because some significant results were discovered. Furthermore, only the most important variables from the literature are used in this study, so there is a chance that some variables are missing, which could affect the results. We would recommend increasing the number of variables in future studies. It would be interesting to include behavioural biases as control variables, such as one that measures overconfidence, as this may increase the likelihood of participation in the future because they overestimate the price.

Another interesting control variable to include is a 'crypto fear & greed index,' which measures the level of fear or greed in the cryptocurrency market at the time. People may be less likely to participate in the crypto market if their level of fear is high, and vice versa. Furthermore, we would be a good addition to use data from different countries, allowing us to study differences between countries. Finally, because we discovered some differences in the determinants of crypto market and stock market participation, future research could focus on this to see if the characteristics of the average crypto market participant differ significantly from those of the average stock market participant.

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