



Exploration of Economic literacy, Psychological and Economic Antecedents to Cryptocurrency Investors' Behavior

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ABSTRACT

Investment in cryptocurrency can bring huge investor profits or losses. An investor should be conscious of the implications of his choices and the variables influencing those choices. Past studied showed that investors' behaviour can be studied by analysing variables like literacy, psychological, social, and economic factors etc that influence their judgements. The authors of this study looked at how economic literacy, psychological characteristics, and economic factors influence the decision-making of cryptocurrency investors in order to fill a research vacuum. The study used primary particulars gathered with the help of an adapted questionnaire from the cryptocurrency investors of Delhi NCR. The data was collected from 300 respondents using convenient sampling, but 244 responses were used for the purpose of analyses. Data were analysed using descriptive statistical techniques, independent t-tests, one-way ANOVA, and regression. It was shown that psychological considerations, as opposed to economic ones, had a greater impact on the decision-making of cryptocurrency investors.

Keywords: Cryptocurrency, satisfaction, behaviour, psychological factors, and economic factors.

1. Introduction

In this global world many options for investment are there, out of which cryptocurrency is the new trend. Blockchain based cryptocurrencies have been continuously evolving as a new form of money during the last decade (Rehman et al., 2020). Economy and cryptocurrency will be having roof and pillar relationship in coming era. Since Bitcoin's introduction to the market in recent years, cryptocurrencies have attracted a lot of interest. The ability to openly trade online without the need for a centralised authority's permission is made possible by cryptocurrencies (Rehman et al., 2020) and make cryptocurrencies easily accessible that have turned it into an international commercial commodity across the world. However, other people believe that cryptocurrencies are unsafe due to the absence of regulatory requirements. But the blockchain mechanism used by cryptocurrencies makes operations traceable. Cryptocurrencies have become increasingly widely used by consumers, rapidly expanding their market share thanks to low transaction fees, peer-to-peer trading hubs, and less regulation. Its large-scale trading, market bubbles, extreme volatility, and herding have all been brought on by this rapid expansion (Jalal et al. 2021).

As the first digital money in the world, Bitcoin currently controls the cryptocurrency market. Other cryptocurrencies are referred to as "Altcoins" in popular parlance (alternative coin). With the exposure of several altcoins and the ongoing progress of legal digital currency in many countries, academics have increasingly focused on the investing potential of cryptocurrencies (Yue et al., 2021). Moreover, India has created Central Bank Digital Currency (CBDC), a digital rendition of currency notes issued by the Reserve Bank of India, the nation's central bank (Ozili, 2023) (Bank, 2022).

Since decades, economic and psychological factors have been regarded as being equally significant in investment decisions (Gianinno & Crittenden, 2005), now the query arises here that whether these factors do affect the investor decision specifically for cryptocurrency. Investors evaluate several points of view before making judgements based on what is likely a very faulty knowledge of economics. Investment in cryptocurrencies was positively connected with both financial literacy and investing experience, albeit investment experience had a greater impact (Zhao & Zhang, 2021).

There are numerous studies that assess financial literacy (Zhao & Zhang, 2021) in India and around the world, but in this study, authors made an attempt to assess economic literacy of cryptocurrency investors. Cryptocurrency is the recent trend therefore this study focused on cryptocurrency investment specifically. With the use of this research foundation, the current study has analyzed cryptocurrency investors' behavior in the Delhi-NCR region. Additionally, it is the first study to look at economic literacy, psychological factors, and economic antecedents of cryptocurrency investors all at once. As a result, the primary goal of this study is to assess the economic literacy of Delhi NCR cryptocurrency investors. Second, this study draws attention to cryptocurrencies among investors and investigates the impact of psychological and economic aspects on satisfaction with decision-making among cryptocurrency investors.

2. Review of Literature

A literature review is a comprehensive and systematic assessment of the research studies related to a particular area. To carry out the research in any area, it is very important to be familiar with the work done in the related areas. Literature makes the foundation for conducting a sensible investigation or research through the application of scientific methods. This section of research paper will provide a glance view on the past studies related to investment decision making, cryptocurrency, demographics, financial literacy, economic literacy, psychological and economic factors. The already existing literature has been reviewed in order to get knowledge about the research gap and future research aspects. The database utilised for the article search was Web of Science, and as of January 30, 2023, 193 publications were located on the associated keywords. Out of those, 60 publications were reviewed, and the research included 29 of those articles and one Reserve Bank of India report since they were relevant to the current investigation. The details related to search criteria including keywords, search filters etc have been explained undersigned.

Table 1: Research article selection criteria:

Database used to search articles	Web of Science	Number of documents
Search criteria as on 30th January 2023	Time period-1995 to 2023 Document type- Article, Review Article Subject category- Economics, Social Sciences, Psychology, Business Finance, Business management Language- English	
Keywords used	“Psychological factors” AND “Investment” “Cryptocurrency” AND “Investment” (time period-2015-2021) “Economic literacy” “Demographics” AND “Investment” “Demographics” AND “Psychological factors” AND “Investment”	66 81 41 106 5
Article reviewed	Out of 193 articles, 133 articles were found to be irrelevant as per this research subject.	60 included for review
Articles included in study	Out of 60 articles	29 included in the study

2.1 Crypto currency investors and economic literacy

Economic literacy studies began in the early 1980s (Gianinno et al. 2005) and it has a direct effect on the financial decision making of people Fornero et al.(2019). But still people have lack of knowledge about this concept. T. A. Wunder et al., (2009) explored that citizen of U.S. have insufficient knowledge about actual economic variables. Hence, they were not aware about taxation and social security that were simply wrong in United States.

As per the study by Burke et al. (2014) more economically literate subjects performed better individual inflation forecasts. The statistics show that numeracy encourages decision-making which is more consistent with economic rationality (Moreira et al., 2020). Even this economics-related knowledge we learned in school sticks with us forever and enables us to make financially satisfying decisions. Gill et al.(2011)examined how California's high school economics requirement affected pupils' literacy related to economy. By applying regression analysis author concluded that students did not keep hold of all the knowledge they acquired in high school but the extent of the reduction in information was very little, results also indicated that economics as mandatory subject had a moderate but statistically significant positive effect on students' economic literacy.

2.2 Economic factors and satisfaction from decision making

Economic reforms or changes in economic elements that have significant financial ramifications for investment decisions seems challenging to undertake since they place stress on investors. It is very challenging for a government also to implement economic reforms and determine the circumstances in which changing policy is most likely to occur as per Fornero et al.(2019). Basically, economic factors are those factors which affect the value of investment (Sarwar & Afaf, 2016). According to the resource theory's hypotheses, there was evidence to support the significance of economic elements in

understanding financial decision-making (Guvuriro et al. 2021). The price movement, risk-taking capability, profitability, and overall performance of cryptocurrencies are all considered as economic factors in this study in order to determine how they affect investors' satisfaction. Economic factors are very important to get satisfaction from decision making especially when the matter revolves around finance, no one is interested in investing such option that does not provide satisfaction.

2.3 Psychological factors and satisfaction from decision making

Overconfidence, herd behavior, and the consulting effect are cognitive characteristics that have an impact on an individual's behavior, particularly their decision-making process (Sarwar & Afaf, 2016). Akhtar et al. (2014) examined the effects of various psychological predecessors, information unevenness, and individual personality factors on short-term investing intents and behaviors. The findings showed that those with greater levels of risk aversion were found to be more receptive to experiencing and conscientious tend to involve in investing of short period. The conclusions also demonstrated that people involved in short period investing at the time of larger information unevenness or asymmetry. Copur (2019) examined economic, social, and psychological factors to increase a better understanding of the saving habits of university staff in Ankara. A total of 171 employees took part in the poll (29.1 percent female and 70.9 male). The findings revealed that certain economic and psychological characteristics were statistically important in determining whether an individual holds both saving and investing accounts, only saving account, or having none of these. The chance of holding a savings account was significantly connected to habits of finance management, recognized subjective standards, and the extent of an individual's planning horizon. The chance of holding both saving as well as investing accounts was remarkably associated to having a residence, financial management habits, and more impulsivity. The outcomes of Ganbat et al., (2021) reported favorable findings from the psychometric assessment of efficient financial decision-making. On basis of literature authors conceptualized the hypothesis as:

2.4 Psychological factors, economic factors and cryptocurrency investors' decision making

An individual's economic prosperity is intimately tied to their level of financial literacy; there is a correlation between that level and wiser investment choices, which ultimately results in decision satisfaction. Differential in retirement planning is extended by different level of financial literacy (Lusardi et al., 2007), participation of investors in financial market (Rooij et al., 2011), decisions of diversification (Calvet et al., 2009) and investment errors (Agarwal et al., 2015). Gurdgiev & O'Loughlin, (2020) examined the issue of how investor decision-making processes and publicly available data flows combine to influence the price dynamics of cryptocurrencies. The impact of public opinion on investment markets and on the pricing of crypto assets was examined using sentiment analysis. The findings showed that the price dynamics of cryptocurrencies exhibit the negative impacts of the preliminary phase (about growth and evolution) securities market, which was marked by forces of volatility, uncertainty, complexity, and ambiguity (VUCA). Because of this, it is more difficult for investors to pinpoint macro- and micro-economic factors that dictate the stability of cryptocurrency values over time and across different market situations (Gurdgiev & O'Loughlin, 2020). Notwithstanding reservations about its flaws, researchers looked into the many variables contributing to the Bitcoin frenzy. Here Kim et al., (2020) expected that Bitcoin investors would differ from share investors in a number of areas, including personality characteristics including psychological conditions, internet usage habits, and investment patterns and numerous variables may interact to affect bitcoin investments, but personality, psychological moods, and investing behavior were particularly significant on.

3. Objectives and Hypotheses of the Study

On the basis of literature reviewed following objectives have been framed and on the basis of objectives hypotheses are proposed.

- a. To measure the economic literacy level of cryptocurrency investors.
- b. To investigate the impact of economic antecedents on cryptocurrency investors' behavior.
- c. To check the impact of psychological factors on cryptocurrency investors' behavior.
- d. To compare how psychological and economic factors influence the behavior of crypto currency investors.

H1 The crypto currency investors have significant knowledge of economic literacy.

H2 The satisfaction levels of cryptocurrency investors in their decision-making processes are significantly influenced by economic factors.

H3 Psychological factors have a significant impact on the satisfaction experienced by cryptocurrency investors in their decision-making processes.

H4 Psychological and economic factors do not have a similar impact on the satisfaction levels of cryptocurrency investors in relation to their decision-making processes.

Research Methodology

The current study explores investor behavior and the effects of psychological factors, economic literacy, and economic antecedents on cryptocurrency investment behavior using research variables. This descriptive study of the behavior of crypto currency investors was led by the main research questions that were:

1. How well-versed cryptocurrency investors are in economic literacy?

2. What are the main variables influencing the actions of cryptocurrency investors?

3.1 Sample Selection

This study has been conducted to comprehend the important aspects that influence decision-making of cryptocurrency investors. Impact of psychological, economic factors and economic literacy on satisfaction level from investment decisions has been assessed. Exploratory research design was used because it will help in identifying cause and effect relationship between variables. Participants were chosen specifically based on their investment in cryptocurrencies and their fulfilment of a few criteria that reflected the social-demographic profile of residents of Delhi NCR. The focus was on the Delhi NCR region since Delhi is a relatively developed metropolis in India. Since cryptocurrency is such a fresh and risky investment choice, most individuals were out of reach who invest in this option.

Among the requirements for selection were:

- Cryptocurrency investors.
- Both male and female belongs to Delhi NCR region.

Out of the 300 individual cryptocurrency investors in the Delhi NCR population, 244 replies were refined and used. Data were gathered using a technique called purposive sampling. Adaptive questionnaire was used to get primary information from the cryptocurrency investors. It is having statements on Likert scale and divided into five segments; first segment includes economic literacy questions, second & third psychological & economic factors related questions, fourth is about decision making of cryptocurrency investors and last section covers demographic profile of respondents covered under study. Analysis was conducted using Statistical package for Social Sciences (SPSS).

4. Data Analysis

Using Cronbach's Alpha in SPSS, the instrument's reproducibility was initially assessed. The value of each item is greater than 0.7 as shown in table 2 which denotes that the data is reliable and consistent.

Table2: Reliability analysis

Items	Cronbach's Alpha	Numbers of items
Psychological factors	.816	10
Economic factors	.944	15
Investors satisfaction	.906	4
Overall	.941	29

4.1 Descriptive Analysis

The frequency of demographic variables, a few investment-related questions, and the economic literacy level of cryptocurrency investors were all examined using descriptive analysis. During descriptive analysis, it was discovered that male respondents outnumbered female respondents. As 60.7% data was collected from males while 39.3% from females. In comparison to the other older age groups across the four age groups, young people were more interested in cryptocurrencies. It was observed that 21-30 range have the greatest percentage of investors (54.5 %), 31-40 age group range covered 30.3%, 41-50 age group includes 13.1% and above 51 age group shows least interest (2%) in cryptocurrency. It has been observed that mostly investors who invest in cryptocurrency have income up to 500000 as it includes 78.7% responses (Table 3).

Table 3: Descriptive Statistics

Demographics Variables	Category	Frequency	Frequency in %
Gender	Male	148	60.7
	Female	96	39.3
Age	21-30	133	54.5
	31-40	74	30.3
	41-50	32	13.1
	51 and above	5	2.0
Annual Income	below 250000	118	48.4
	250000-500000	74	30.3
	500001-750000	34	13.9
	750001-1000000	11	4.5
	above 1000000	7	2.9

As results shown in Table 4 concluded that the basic objective of investors behind investment was to earn regular income (56%) as well as to accumulate wealth (32%). Majority of investors manage their investment account themselves (71.7%) while 14.8 % consult brokers while 13.5 % investors consult friends or relatives respectively. It was observed that most of the investors were interested in short term gain that counts 44.3% while 31.6% followed long term appreciation motive as trading strategy.

Table 4: Descriptive statistics of investment related questions

Category	Sub- category statements	Frequency	Frequency in %
Portfolio objectives	to accumulate wealth	78	32.0
	to earn regular income	138	56.0
	tax management	12	4.9
	protecting family future	16	6.6
Management of trading account	Self	175	71.7
	Broker	36	14.8
	friend/relative	33	13.5
Trading strategy	short term gain	108	44.3
	medium term gain	59	24.2
	long term appreciation	77	31.6

Results from table 5 concluded that most of the cryptocurrency investors were aware about the meaning of scarcity, opportunity cost, profit, and function of money but they were less knowledgeable regarding the concept of demand and supply.

Table 5: Descriptive statistics of economic literacy

Sr. No.	Statements	Responses	Frequency	Frequency in%
1	What primary function is money serving when it is used to buy crypto currency?	Incorrect	109	44.7
		Correct	135	55.3
2	The problem of scarcity means	Incorrect	81	33.2
		Correct	163	66.8
3	If price value of cryptocurrency decreases, then there will be	Incorrect	144	59.0
		Correct	100	41.0
4	Opportunity cost meaning	Incorrect	83	34.0
		Correct	161	66.0
5	Profit means	Incorrect	65	26.6
		Correct	179	73.4

4.2 Inferential statistics

Inferential statistics were used to examine how psychological and economic aspects affect decision-making satisfaction levels. For demographics, a 0.05 significance level independent t-test and one-way ANOVA were employed.

Table 6: Inferential statistics

Test variable	Grouping variable	p-value	Test
Overconfidence	Gender	0.965	Independent t-test
Herd behavior		0.941	Independent t-test
Consultancy effect		0.895	Independent t-test
Price movement		0.673	Independent t-test
Risk taking capacity		0.916	Independent t-test
Profitability		0.628	Independent t-test
Overall performance of crypto currency		0.967	Independent t-test
Investor decision making (satisfaction)		0.370	Independent t-test
Psychological factor	Age	0.182	One way ANOVA
Economic factor		0.33	One way ANOVA
Decision making behavior		0.00	One way ANOVA
Psychological factor	Annual Income	0.06	One way ANOVA
Economic factor		0.01	One way ANOVA
Decision making behavior		0.00	One way ANOVA

Inferential statistics were employed to investigate how demography affected psychological, economic, and decision-making processes. To study the impact of gender, independent t-test and further one way ANOVA for age, income with significance level ($\alpha=0.05$) was used. Independent t-test findings revealed that there is no connection between gender and psychological aspects, economic considerations, or investors' decision-making satisfaction.

One way ANOVA results concluded substantial association between age and economic factors with a 0.00 significant-value which is below 0.005 p-value. Here null hypothesis was rejected against alternate hypothesis. Further, annual income also showed a significant relationship with economic factors and investors satisfaction level from their decision making with a significant value of 0.01 and 0.00 respectively. Significant value in case of psychological factor with annual income was 0.06 and with age was .182, greater than 0.05 p-value implied no significant relationship of psychological factors with annual income and age.

4.3 Regression analysis

In regression analysis cause and effect relationship between dependent variable and independent variable is checked. It is assumed that there is a variable that is influencing another one. Assumptions associated with a linear regression model include: Normality and No perfect multicollinearity.

4.4 Assumptions of regression analysis

4.4.1 Normality of data

To check normality of data Q-Q plot was used. The results found that data related to satisfaction, psychological and economic factors was normally distributed (figure 1,2,3).

Figure 1 Q-Q plot of psychological factor

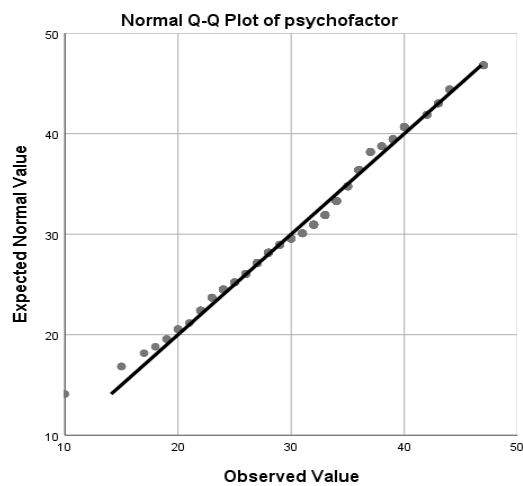


Figure 2 Q-Q plot of Economic factors

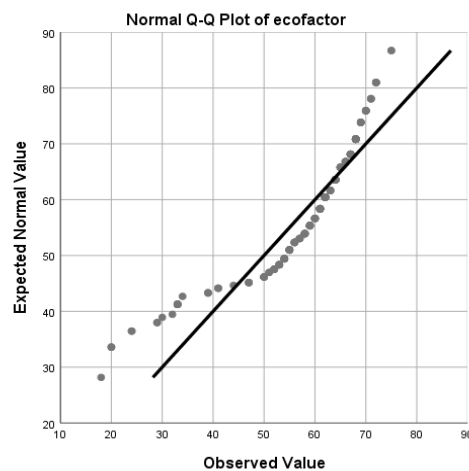
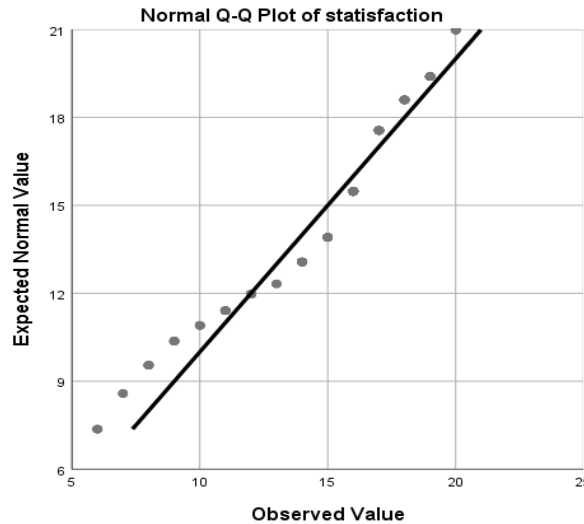


Figure 3 Q-Q plot of investors' satisfaction level from their decision making



4.4.2 Multicollinearity

Whenever two or more independent variables/ predictor variable in a regression model are highly correlated than it gives arise to the problem of multicollinearity. This problem of multicollinearity will result in less reliable conclusions because of large standard errors and that put question on the standard of research. A statistical technique named Variance Inflation Factor (VIF) is used to detect the multicollinearity which determines the strength of correlation between variables. Variables with a VIF value of 1 are not correlated, those with a value between 1 and 5 are moderately correlated, and those with a value above 5 are strongly correlated and as per Table 7, the value of VIF is almost equal to 1, hence multicollinearity is not an issue.

Table 7: Multicollinearity test

Coefficients			
Model		Collinearity Statistics	
		Tolerance	VIF
1	Economic factor	0.725	1.379
	Psychological factor	0.725	1.379

Linear regression was applied with two independent variables (psychological and economic component) with decision-making satisfaction as the dependent variable in order to investigate the cause-and-effect relationship.

Table 8 shows the value of correlation coefficient that is .544 (>0.5), indicating a somewhat good link between psychological components and decision-making satisfaction. R2 = 0.296, which indicates that psychological variables account for 29.6% of the variation in decision-making satisfaction.

Table 8: Regression analysis of psychological factors and satisfaction level from decision making

Model	Items	B	R	R square	Sig.
1	Constant	6.052			
	Psychological factor	.272	.544	.296	.000

The correlation coefficient value in Table 9 is .634, which is more than 0.5 and indicates a moderately favourable link between economic considerations and decision-making satisfaction. The decision-making satisfaction level has a R2 value of 0.402, which indicates that economic considerations account for 40.2% of the variation.

Table 9: Regression analysis of Economic factors and satisfaction level from decision making

Model	Items	B	R	R square	Sig.
1	Constant	3.709			
	Economic factors	.190	.634	.402	.000

The value of constant for psychological and economic factors which is intercept is 6.052 and 3.709 respectively. The value of slope or beta for psychological factor is 0.272 and 0.190 for economic factor. Then the equation will be as follows:

Satisfaction from Decision making behavior= $6.052 + (0.272 \times \text{Psychological factors})$

Satisfaction from Decision making behavior= $3.709 + (0.190 \times \text{economic factors})$

According to the equations, one unit of change in a psychological component can result in 6.052 changes in decision-making behavior, and decision-making satisfaction would change by 3.709 for every unit change in an economic factor.

5. Results and Discussion

Results of the descriptive analysis indicated that men invest more than women. The results are similar to the results of research (Pangestu & Karnadi, 2020) (Lusardi et al., 2010) (Lotto, 2020). Investors who are young especially 20-40 age group invest more in cryptocurrency to earn regular income and to accumulate wealth. Mostly investors are managing their investment account themselves and focusing on short-term gain as trading strategy. Investors having income up to 500000 are more interesting in cryptocurrency. An independent t-test has been performed to check the association of gender with decision-making satisfaction of Bitcoin investors and other factors such as psychological, economic, or other factors and outcomes revealed no such relationship. Outcomes of one-way ANOVA represented that there is significant association of age and income with economic factors. Also, significant relationship between income and satisfaction from decision making was observed. The outcome is in line with past research's findings (Krannich et al., 1988; Lown et al., 2016; Sarwar & Afaf, 2017). However, some studies show that age and satisfaction are not significantly related (Joo et al. 2004).

The hypothesis that stated cryptocurrency investors have significant knowledge of economic literacy is accepted. Regression analysis revealed a moderately favorable connection between psychological and economic parameters and investors' satisfaction with their choice of cryptocurrency investment. As a result the hypothesis forth is accepted. Earlier studies also supported the same relationship (Sarwar & Afaf, 2017; Naqvi et al., 2020; Muradoglu & Harvey, 2012). It was observed that psychological factors have more impression on the satisfaction from decision making of cryptocurrency investors as compared to the impact of economic factors. The outcomes are reliable as these are consistent with research of Sarwar & Afaf, (2017).

6. Conclusion

This research analyzed the behavior of cryptocurrency investors of Delhi NCR. The paper's goal was to assess Bitcoin investors' economic literacy. The study emphasized on the impact of economic and psychological factors on satisfaction from decision making behavior of cryptocurrency investors. The study concluded that cryptocurrency investors were aware about the concept of scarcity, opportunity cost, money, profit but have less knowledge regarding demand and supply. The results showed that factors such as age, income have significant relationship with economic factors. Income also has a significant impact on satisfaction from decision making of cryptocurrency investors implying satisfaction from decision will increase with the increase in income. Our research support previous research on demographic variables.

The insights from this study can help policy makers for understanding diversified Indian investors' behavior. The result of the study state that both psychological factors such as overconfidence, herd behavior, consultancy effect and economic factors such as price movement, risk taking capacity, profitability, overall performance of cryptocurrency have significant relationship with satisfaction from decision making. It was shown that psychological variables have a greater influence on cryptocurrency investors' decisions than economic factor do. It indicates that psychological factor measured using overconfidence, herd behavior; consultancy effect variables have influenced more the decision making as compare to economic factors measured by price movement, risk taking capacity, profitability, and overall performance variables.

The sample is solely comprised of investors who have made investments in cryptocurrencies due to the dataset's limitations. Consequently, there might be a selection bias. Based on the set of information used in this study, we were also not able to show prejudice between direct and indirect cryptocurrency investment. Even though it is feasible that people who invest in cryptocurrencies indirectly through a cryptocurrency investment fund don't share the same traits or objectives as those who do so directly. The participants of this study were individuals of Delhi NCR region only. As a result, it was impossible to generalize the outcomes of our study to investors worldwide. Given that most of the data were gathered using self-report questionnaires, there was a chance of reporting bias that need to be considered. Even though we made every effort to prevent it by using suitable data collecting time (1 month), issuing reminders, and maintaining confidentiality, there may still be non-response bias.

Research can be conducted for the comparison of cryptocurrency investors of different countries. There can also be other factors that affect satisfaction level. Future studies may concentrate on these additional variables and consider focusing solely on direct cryptocurrency traders to see if there have been any discernible differences between direct and indirect cryptocurrency traders. It is possible to conduct more study with a sizable sample size and a wider geographic scope.

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