

Behavioral factors in today's cryptocurrency markets: A survey among university students

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Abstract: This paper discusses behavioral aspects that drive students to invest in cryptocurrencies. University students represent a growing category of investors within digital finance markets. In today's society, students invest, for example, in Bitcoin, especially on social networking sites. Using a sample of 104 students from diverse geographic and academic backgrounds, we tested the impact of age and education level on five behavioral factors: the potential for high returns, interest in investment technology and blockchain, recommendations from friends and family, fear of missing out (FOMO), and diversification of investment portfolios. Based on a structured questionnaire, we analyzed the data using cross-tabulations. We also researched specific behaviors using SPSS. Using an analytical framework of decision-making and rational expectations theory, the paper shows that technological sophistication, peer recommendations, and portfolio diversification enhance cryptocurrency investment choices. Seeking high potential returns and FOMO, however, had little impact. The research is helpful for educators, financial advisors, and policymakers. This study provides useful information to educators, financial planners, and policymakers who require information on how to implement effective financial competency campaigns for youth to increase positive financial behaviors. These findings provide helpful insights for formulating strategies to improve financial literacy and the application of investment actions among young investors.

Keywords: cryptocurrency investment; behavioral factors; financial literacy; decision-making; university students

Citation:

Abou Saad, R. & Sági, J. (2025). Behavioral factors in today's cryptocurrency markets: A survey among university students. *Prosperitas*, 12(1), Article 2. Budapest Business University. https://doi.org/10.31570/prosp_2025_0122

History:

Received: 9 Nov 2024
Revised: 12 Dec 2024
Accepted: 18 Dec 2024
Published: 15 Jan 2025



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1. Introduction

Technological advancements and developments are the hallmark of the modern era and impact all aspects of our lives in the economic, legal, social, cultural, and even political spheres. Research papers within this category largely concur that the idea of cryptocurrencies was introduced by Satoshi Nakamoto, the creator of the first cryptocurrency (Bitcoin), who published the cryptocurrency concept in a paper in 2008, and then later launched the actual Bitcoin software on 8th January 2009 to enable individuals to use bitcoin as a type of currency around the globe just as the dollar and the euro are used (Chakravaram et al., 2021; Wang, 2020; Farrell, 2015). Bitcoin has value, is independent does not fall under government control, and is being widely used. One of the most contemporary economic issues to be studied and understood due to its ambiguity and controversy in the last decade (Taleb, 2021).

In recent years, there has been a noticeable increase in the popularity of cryptocurrencies through social media platforms. This is especially true among younger demographics who are actively involved in cryptocurrency markets. As for the explanations for this trend, academic background and knowledge of the banking and financial sector acquired during university studies, or the apparent influence of friends, family and community members may be mentioned. Be that as it may, students have clearly shown interest in and commitment to investing in cryptocurrencies.

We invited undergraduate and graduate students from various universities to contribute to the study: with respect to this particular sample population, we wished to analyze the factors that shape behavior when changes in bitcoin value happen (Gao, 2016). There is a need to investigate and understand the growing rationale behind the almost unfathomable dedication of university students to the cryptocurrency market. The primary objective of this research was to examine the attitudes, motives, financial behavior, and psychology of students in relation to the decision to invest in cryptocurrencies and the risk/reward relationship associated with these digital currencies.

Accordingly, this research aims to examine and identify the factors that influence university students' decisions to invest or not to invest in cryptocurrencies and, if they do invest, what type of investors they are. Research questions address two aspects. Firstly, there are general research questions: What is the relationship between psychological factors and crypto trading among university students? What measures affect students' psychological behaviors in the crypto trading market? Secondly, there is also the specific research question: How do psychological biases such as the potential for high returns, recommendations from friends or family, and fear of missing out (FOMO) affect university students' decisions to invest in cryptocurrencies, and how do students behave as investors in cryptocurrency markets?

2. Literature review

The literature review discusses the main effects of the increase in cryptocurrency trading and how these effects relate to psychological theories concerning university students in our age of globalization, as seen by scholars.

First and foremost, a study exploring students' perspectives on the use of blockchain technologies was conducted during the COVID-19 period using a questionnaire on a sample of 64 students from 7 different educational majors at the Algebra University of Croatia. The results showed that although most students were aware of Bitcoin, only 26.6% owned any cryptocurrency, and less than half of the surveyed students intended to invest in the technology due to its unfamiliarity and unregulated price market volatility (Knežević et al., 2020). Furthermore, during periods of instability of the selected cryptocurrencies, behavioral biases in the trading environment significantly impacted traders' strategic decisions. Shahid et al. (2018), Nobre et al. (2022), and Gharbi and Jarboui (2022) used both qualitative and quantitative methods to examine the link between behavioral biases and strategic decision-making in the field of management. They found that psychological factors like emotional intelligence, overconfidence, risk aversion, and optimism aided decision-making. Chang et al. (2022) conducted social network analysis experiments on secondary school students and Bitcoin trader networks. They found that the environment influenced both groups to behave similarly to the majority in the ways they traded and lived. This influence reinforces the decision-making process regarding security issues within the trading network.

In their study, Mattke et al. (2021) used mixed-method research and supplemented it with a fuzzy-set qualitative comparative analysis (fsQCA) to determine seven motivational factors unique to Bitcoin usage. They stated that the most prominent incentive found in their sample involved a Bitcoin ideological belief, which was described as a conviction in a decentralized, revolutionist form of money. This, however, contrasts with those persons who are engaged in this money primarily because of the profit that it brings, which means that such individuals were mainly in the Bitcoin trading business for business reasons and not because of the technology itself. Furthermore, a new cryptocurrency categorization system was used to analyze college students' perceptions of use, which followed a methodology divided into three sections: categorization of cryptocurrencies, previous literature on the adoption of cryptocurrency usage in Europe, and a questionnaire among college students to examine their perceptions of said currencies. Results indicate that college students have a higher perception of cryptos as an asset than as a medium of exchange. Furthermore, government regulations and restrictions influence the acceptance of cryptos (Butt, 2021).

In addition, Maduranga et al. (2022) conducted a linear regression analysis among non-state university students in Sri Lanka, validating two variables from their hypothesis testing. These variables were awareness and ease of use, which positively influenced behavioral intention among non-state university undergraduates, while trust and risk negatively impacted their behavior. Rahyuda and Candradewi's (2023) study, which surveyed 179 active university

students in Bali, Indonesia, found that herding behavior and perceived risk significantly influenced students' investment decisions. These factors correlate perfectly with the students' financial literacy level in the cryptocurrency market.

Given the research gaps and the lack of studies that would clearly show and combine the above psychological variables concerning the crypto markets, the present study aims to shed light on the issue by examining other important psychological factors that influence trading behaviors among 104 undergraduate and postgraduate university students from a range of nationalities, age groups, and educational backgrounds. While these studies tackle the psychological motivations that underlie investment behaviors. However, little research has been conducted to determine how these influences are present among university students, a problem this study seeks to solve. Therefore, the present research proposes the following hypotheses:

Hypothesis 1 (H1): The potential for high returns positively influences university students' crypto investment decisions.

Hypothesis 2 (H2): Nowadays, interest in technology and blockchain positively affects university students' crypto investment decisions.

Hypothesis 3 (H3): Recommendations from friends or family positively affect crypto investment decisions.

Hypothesis 4 (H4): FOMO does not positively affect investment decisions in crypto among university students.

Hypothesis 5 (H5): Diversified investment portfolios positively affect students' crypto investment decisions.

3. Methodology

The main purpose of this study is to describe and explain the methodology used and the collection of primary data. We have divided the primary data into four sub-sections, each of which is described below.

3.1. Context

This research aims to investigate the phenomenon of cryptocurrency trading investment, which has become increasingly prevalent globally through various trading platforms, including applications, brokers, and prop firms. Moreover, researchers have previously highlighted the crucial role of psychological factors in trading behaviors and habits, particularly among younger generations and university students. These factors, i.e. strong beliefs and overconfidence in trading styles, significantly influence trading decisions, often without considering the psychological implications of losing and winning scenarios. However, this study aims to improve our understanding of the factors that limit excessive spending in the trading world.

3.2. Participants

In this study, 104 university students (N = 104) shared their cryptocurrency investment perspectives and experiences. The research focuses on two main factors: the student's age and educational level. Participants were contacted via social media platforms such as Facebook and WhatsApp groups, and university-based groups were selected to include diverse areas of academic backgrounds and regions. Respondents were students from different European and Middle Eastern universities aged between 18 and 30+. The survey also captured the academic background of the respondents, categorizing them into three groups: undergraduate students, those pursuing a master's degree or Doctorate, and finally those who are undergraduates but do not have an active status at the university. Moreover, areas of specialization mainly comprised areas of finance and economics, and other related fields in engineering, social sciences, and arts. This diversity offers a better perspective of the impact of education on investments.

3.3. Data collection and analysis

To obtain the desired results from the findings, the study used a quantitative method to collect accurate data. Furthermore, the questionnaire consisted of a mixture of 1 closed (yes/no) question and 11 multiple-choice questions. For instance, one of the central questions was “How do you react to sudden price fluctuations or volatility in the cryptocurrency markets?” and the choices were: “Buy more cryptocurrencies; Hold onto existing investments; Sell some or all of my investments; Wait and observe before making any decision; Other.” The questionnaire in its entirety can be found at the end of this paper, in Appendix 1.

We designed and implemented the survey using online Google Forms and shared the link on social media platforms like WhatsApp and Facebook to encourage respondents to complete the survey. We circulated the questionnaire among university students for over a month. Respondents demonstrated their willingness to help by completing the questionnaire within the above timeframe. We analyzed the relationships between the variables in the questionnaire using crosstabulation (crosstabs) in the Statistical Package for the Social Sciences (SPSS).

4. Results

This study examines the behavior of university students and their reasons for using digital currencies, focusing on the segment that has embraced cryptocurrencies. Bitcoin and other cryptocurrencies have received much attention recently, particularly from young people in the academic community on social media. Therefore, understanding the motivations of university students to invest in cryptocurrencies will allow us to outline the significant stimuli and regularities in the use of digital currencies. The results of the identified demographic characteristics and the frequency of students' investment behavior, grouped according to the two independent variables of age and level of education are presented in the following tables and brief descriptions. Tables 1 and 2 show the breakdown of students surveyed by age group and level of education. Table 1 shows the distribution of responses according to the first independent variable of the study, age demographics.

Table 1. Responses to the distributed questionnaire in relation to the first control variable (age groups).
Source: Authors' own

Age Group	Number of responses (N)	Response rate (%)
18-20	23	22.10%
21-24	31	29.80%
25-29	29	27.90%
30 or above	21	20.20%
Total	104	100.00%

As shown in Table 1, most participants are between 21 and 24 years old making up 29.80%, the second largest group are 25-29-year-olds. Those aged between 18 and 20 and those aged 30 years and older make up a smaller proportion of the participants, with 22.10% and 20.20%, respectively. Table 2 shows the three category levels of the second variable in the study, the education level of the participants:

Table 2. Participants' responses in relation to the second control variable (level of education). *Source: Authors' own*

Educational Level	Number of responses (N)	Response rate (%)
Undergraduate Student	36	34.60%
Graduate student (Master's or PhD)	39	37.50%
Completed undergraduate degree but not currently enrolled	29	27.90%
Total	104	100.00%

As shown in Table 2, 37.50% of the respondents are master's degree or PhD students, forming the largest group in the sample. Undergraduate students followed with 34.60%, and the remaining 27.90% of the participants had previously obtained an undergraduate degree. The following table (Table 3) shows the five motivational factors for university students to invest in cryptocurrencies by age group:

Table 3. Crosstab Analysis of Age Groups and Investment Factors. Source: Authors' own

Age Group	Factor 1: Potential for High Returns	Factor 2: Interest in Technology and Blockchain	Factor 3: Recommendation from Friends or Family	Factor 4: FOMO	Factor 5: Diversification of Investment Portfolio
18-20	19	3	12	7	1
21-24	24	14	11	13	10
25-29	21	12	10	11	14
30 or above	15	10	6	9	10
Total	79	39	39	40	35

As can be seen in Table 3, the potential for high returns remains the most significant factor across all age groups, which underscores the popular theme of investment gains. The analysis of students' technological interest in blockchain technology reveals an exceptionally high level of curiosity or confidence expressed by this age group, particularly among students aged 21 to 24. Additionally, the analysis shows that FOMO and the need for investment diversification, both essential factors that vary according to age, also contribute to students' technological interest. However, the youngest participants, aged 18-20, are the least concerned about diversification, probably because they need to gain some experience with cryptocurrency investments. The following table (Table 4) shows how chi-square tests relate age groups to the factors that are critical in making cryptocurrency investment decisions.

Table 4. Chi-Square Tests for the relationship between age group and factors affecting cryptocurrency investment decisions. Source: Authors' own

Factor	Chi-Square Value	df	Asymptotic Significance (2-sided)
Potential for High Returns	1.029	3	0.794
Interest in Technology and Blockchain	7.75	3	0.051
Recommendations from Friends or Family	2.994	3	0.393
FOMO	0.959	3	0.811
Diversification of Investment Portfolio	13.485	3	0.004

The collected data reveals a statistically significant correlation between the variable 'age' and the factor 'diversification of investment portfolio,' with a probability value of 0.004. This means that older students may prioritize diversification more than their younger counterparts. We also concluded that as individuals get older, they will value the importance of diversifying their investments and possibly improve their financial literacy. Moreover, there was no statistically significant correlation between the potential for high returns and FOMO across the various age groups, which suggests that these motivations are universal across age groups. Table 5 shows how students' level of education influences the factors that drive cryptocurrency use and investment decisions:

Table 5. Crosstab analysis of education level and investment factors. *Source: Authors' own*

Educational Level	Factor 1: Potential for High Returns	Factor 2: Interest in Technology and Blockchain	Factor 3: Recommendation from Friends or Family	Factor 4: FOMO	Factor 5: Diversification of Investment Portfolio
Undergraduate	30	6	15	12	4
Graduate (MSc. /PhD.)	27	18	9	13	18
Not Enrolled (past undergraduate)	22	15	15	15	13
Total	79	39	39	40	35

We concluded that the potential for high returns is equally important at all levels of education. However, graduate students are more focused on technology and blockchain. This implies that the technical aspects of cryptocurrencies are more likely to be appreciated by those with a higher level of education. In addition, graduate students are more concerned about portfolio diversification than undergraduate students, who rely mainly on word of mouth and recommendations from friends and family members. Differences in the level of financial literacy on cryptocurrency among individuals and the propensity to take risks among the different educational groups could account for this change. The Chi-square tests in Table 6 examine the effect of educational level on cryptocurrency investment decision-making and factors:

Table 6. Chi-Square tests for the relationship between level of education and factors influencing decision to invest in cryptocurrencies. *Source: Authors' own*

Factor	Chi-Square Value	df	Asymptotic Significance (2-sided)
Potential for High Returns	2.039	2	0.361
Interest in Technology and Blockchain	10.416	2	0.005
Recommendations from Friends or Family	6.232	2	0.044
FOMO	2.989	2	0.224
Diversification of Investment Portfolio	12.544	2	0.002

The results reveal statistically significant associations between educational level and three factors: technology and blockchain ($p = 0.005$), friends or family recommendations ($p = 0.044$), and investment portfolio diversification ($p = 0.002$). Hence, based on these findings, we can say that the educational level of students is a primary determinant of their cryptocurrency investment. For example, graduate students spend more time understanding technology and making strategic investments, such as diversification, than students with lower educational levels, who make decisions quickly based on social recommendations and their environment.

5. Discussion

The analysis of the significant findings of the research aimed to identify the behavioral factors through which the educational level and the age group of university students influence motivation to invest in cryptocurrency. Using the two independent variables of age group and educational level, this study examines how different demographic variables affect the willingness to invest in the cryptocurrency market. First, we tested the relationship between educational level and the belief in the possibility of high returns. The chi-square value of 2.039 and the probability level of 0.36 indicate that most respondents have high expectations of returns. Therefore, we accepted the null hypothesis as the p -value (0.05) is equal to the 5%

significance level, which means there is insufficient strong evidence of a significant effect. Similarly, no correlation was found between age group and expectation for high returns, showing that students at all levels of education and across different age categories expect high returns when investing in cryptocurrencies, which makes the potential for high returns a common factor across all educational levels in the studied sample.

Second, statistical significance was increased ($\chi^2 = 10.416$, $p = 0.005$) when we tested the educational level in relation to the interest in technology and blockchain as part of the demographics. Respondents interested in investing for technological reasons were predominantly graduate students (46.15%) and postgraduate students (38.46%), while undergraduate students were a minority. Similarly, the cross-tabulation by age revealed that postgraduates and students in the pre-employment category, who typically have more knowledge and experience, were more interested in and attentive to the technological aspects of cryptocurrencies than other age groups.

Third, we analyzed the data for the effect of recommendations by friends or family as a factor in relation to the level of education ($\chi^2 = 6.232$, $p = 0.044$). The results showed that undergraduate students were more likely to follow recommendations (38.46%) than graduate students (23.07%), which indicates that recommendations from others play an important role in investor behavior and decisions. The distribution by age shows that younger persons are more likely to listen to others in their age group. This shows that because they may lack the confidence or knowledge to make investment decisions, less experienced and new investors rely on the recommendations of friends and relatives.

Moreover, with regards to the FOMO factor, the Chi-Square test revealed no relationship between educational level and FOMO ($\chi^2 = 2.989$, $p = 0.224$). Similarly, we observed no variability in FOMO by age group, which indicates that its significance remained invariant. This demonstrates that FOMO is a cross-sectional incentive that extends to levels of education and age. Therefore, personal traits may not influence FOMO, but general trends such as market trends or popular trends on social media may do so.

Finally, the educational level was strongly related to the investment portfolio diversification attribute, $\chi^2 = 12.544$, $p = 0.002$). Graduate students (51.43%) and former undergraduates (37.14%), defined as those who have completed their first degree but are not currently enrolled, were more likely to invest in cryptocurrencies than undergraduate students (11.42%). In addition, diversification as a motivating factor was more strongly expressed by older students, i.e. those further along in their education journey. This suggests that educated and older investors are more likely to make rational decisions and include cryptocurrencies in their investment portfolios to diversify risks. On the basis of the results, Table 7 summarizes the previously formulated hypotheses and indicates whether or not the findings support them:

Table 7. Summary results of proposed hypotheses. Source: Authors' own

Hypothesis	Result
H1: The potential for high returns affects crypto investment decisions.	Not Supported
H2: Interest in technology and blockchain positively influences students' crypto investment decisions.	Supported
H3: Recommendations from friends or family positively affect crypto investment decisions.	Supported
H4: FOMO does not influence crypto investment decisions.	Not Supported
H5: Diversification of investment portfolios positively affects students' crypto investment decisions.	Supported

Therefore, we can conclude that education level and age group have a moderating effect on some of the motivational factors affecting cryptocurrency investment. Some slight differences increase with age and education: in particular interest in technology and blockchain, recommendations by friends and family, and the diversification of investment

portfolios. Other factors, such as the potential for high returns and FOMO, appear to be helpful but are not directly influenced by demographic indicators. Therefore, older students and post-graduates with high technological skills and diverse interests are more attracted to the crypto investment market. In contrast, young and inexperienced investors are mainly influenced by recommendations from family and friends.

Even though the observed behavioral patterns correlate with respondents' age and educational background in the sample. For example, the nature of change in graduate students' portfolio preferences may require more attention to portfolio diversification, which may be explained by their age, or, more specifically, life experience rather than only by the academic effect. At the same time, the role of education and age characteristics further stress the necessity of subsequent studies considering the differentiation between the influence of education level and age-related characteristics. This indicates that our findings are consistent with previous scholarly research about financial literacy pointing at education as an influential factor in determining the ability to invest. Zhao and Zhang (2021) employed a three-model hierarchical logistic regression analysis based on the National Financial Capability Study (NFCS) Investor Survey of 2018, and they found that there was positive dependency of cryptocurrency investments on two factors: financial literacy and investment experience, but investment experience was dominant. Similarly, Lusardi and Mitchell (2014) as well as Van Rooij et al. (2011) in their studies agreed on a common ground that education level shapes financial literacy levels and the corresponding probability of undertaking strategic investment plans. The same can be observed in the shifts of concerns regarding investments in cryptocurrencies, technology, blockchain, and diversification of portfolio as a concern among the groups of graduate students. Yet, these observations give clear justification for undertaking initiatives aimed at improving users' knowledge of financial services, particularly as far as young and relatively inexperienced clientele active in digital finance is concerned.

6. Conclusions

The present study aimed to describe cryptocurrency investment, particularly among university students. The paper is one of the few that attempts to identify the relationship between education, age, and motivations for investing in emerging financial markets. Additionally, the variables of this study take into account the perception and use of cryptocurrencies by various subgroups of students. The paper documents the psychological and educational considerations that have an impact on investments in cryptocurrencies. The key findings of the current study revealed that technology, blockchain, social networks, and portfolio diversification are the main drivers of investment choice. The study analyzed these motivations with respect to both financial behavior and learning psychology. As a result, the article contributes to the development of investment behavior theory. It provides educators, policymakers, and financial advisors with evidence on how to help young investors in the world of digital assets.

The present study's findings about the behavioral factors that affect cryptocurrency investments among university students are not exempted from the limitations inherent in the study. The data were collected solely from the above university students who had specific demographic structures and academic backgrounds. Therefore, since our study focused on a particular set of people, the findings cannot be applied to the general population of digital investors and customers. These results should not be generalized to other types of investors, including workers, or retirees since the observed behaviors and motivations may differ across these groups.

In addition, these limitations should be addressed in future research. This study focused on education level and age groups as critical variables. Future studies may also examine other variables, such as cultural orientation and income level, as the inclusion of such variables may help to explain why university students invest in cryptocurrencies. However, the studies need to be conducted on a large scale, with real investment data to overcome some limitations such as socially desirable responses and recall bias, which will increase the validity of the findings. Therefore, future studies should take into account the regulatory changes affecting cryptocurrencies and their market as well as the motivations behind investment decisions, particularly in light of significant changes such as the shifting position of the US authorities and the reclassification of cryptocurrencies as commodities. We need to provide a new empirical

analysis of investor behavior and market characteristics to elucidate how cryptocurrencies can evolve and actively penetrate financial markets. Finally, future research should aim to identify how motivation and investment activities are influenced by different aspects such as type of education, age, and others, as this could provide a deeper understanding of how different segments of the population react to emerging financial assets like cryptocurrencies.

In conclusion, this research has several practical implications for educators, financial advisors, and policymakers. First, theoretically conceived targeted educational interventions aimed at improving the existing and/or necessary students' financial literacy should be launched to investors, especially university students who are an increasingly significant group in cryptocurrency markets. Perhaps, the educational curriculum could pay more attention to the aspects, risks, and benefits of investing in a Cryptocurrency, to develop intelligent decision-making among individuals. These insights could be helpful to financial advisors in creating personalized advisory services for students whereby they can appreciate the various risks associated with multiple investment opportunities to manage the risks by making the right investment decisions. Lastly, young investors may be advised to include lessons about finances in the classroom experience and conduct more extensive marketing campaigns to support these investors.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

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Appendices

Appendix 1: Questionnaire

Below are the questions from the conducted questionnaire in the research field in Google Forms:

1. What is your age group? (18-20/ 21-24/ 25-29/ 30 or above).
2. What is your current level of education? (Undergraduate student/ Graduate student Master's or Ph.D./ Completed undergraduate degree but not currently enrolled).
3. Have you ever invested in cryptocurrencies? (Yes/ No).
4. If yes, what are the primary motivational/psychological factors for investing in cryptocurrencies? (Potential for high returns/ Interest in technology and blockchain/ Recommendation from friends or family/ FOMO/ Diversification of investment portfolio/ Other).
5. What are your primary concerns or reservations, if any, about investing in cryptocurrencies? (Lack of regulation and legal uncertainties/ Volatility and price fluctuations/ Security risks (e.g., hacking, theft)/ Complexity and technical barriers/ Reputation and credibility of cryptocurrencies).
6. How would you rate your level of risk perception when investing in cryptocurrencies? (Very Low, Low, Moderate, High, Very High).
7. How would you rate your knowledge and understanding of cryptocurrencies and blockchain technology? (Very Low, Low, Moderate, High, Very High).
8. What sources do you primarily rely on for information and research about cryptocurrencies? (News websites and blogs/ Social media platforms and applications (e.g., Twitter, Reddit, Revolut)/ Cryptocurrency exchanges/ Online forums and communities/ Academic research articles/ other).
9. How often do you monitor the performance of your cryptocurrency investments? (Multiple times a day/ Once a day/ Few times a week/ Once a week/ Less than once a week).
10. Have you ever experienced significant gains or losses from your cryptocurrency investments? (Yes, significant gains/ Yes, significant losses/ No, neither significant gains nor losses).
11. How do you react to sudden price fluctuations or volatility in the cryptocurrency markets? (Buy more cryptocurrencies/ Hold onto existing investments/ Sell some or all of my investments/ Wait and observe before making any decision/ Other).
12. Based on your overall previous experience in crypto markets. How confident are you to make successful investment decisions in cryptocurrencies? (Not confident at all/ Not very confident/ Neutral/ Confident/ Very confident).