

Association for Information Systems

AIS Electronic Library (AISeL)

ITAIS 2021 Proceedings

Annual conference of the Italian Chapter of AIS
(ITAIS)

2021

The Influence of Investors' Risk Attitude and Market Information on Cryptocurrency Investment: Evidence from an Experimental Study

Jalal Raja Nabeel-Ud-Din

Università degli Studi G. d'A. Chieti-Pescara, nabeel.jalal@unich.it

Francesca Di Pietro

Trinity Business School, Trinity College Dublin, francesca.dipietro@tcd.ie

Simona Leonelli

University of Padua, simona.leonelli@unipd.it

Follow this and additional works at: <https://aisel.aisnet.org/itais2021>

Recommended Citation

Raja Nabeel-Ud-Din, Jalal; Di Pietro, Francesca; and Leonelli, Simona, "The Influence of Investors' Risk Attitude and Market Information on Cryptocurrency Investment: Evidence from an Experimental Study" (2021). *ITAIS 2021 Proceedings*. 3.

<https://aisel.aisnet.org/itais2021/3>

This material is brought to you by the Annual conference of the Italian Chapter of AIS (ITAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ITAIS 2021 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

The Influence of Investors' Risk Attitude and Market Information on Cryptocurrency Investment: Evidence from an Experimental Study

Raja Nabeel-Ud-Din Jalal¹[0000-0002-1311-1418],

Francesca Di Pietro²[0000-0002-2436-1682]

Simona Leonelli³[0000-0001-8199-4585]

¹ Università degli Studi G.d'A Chieti-Pescara, Italy. Email: nabeel.jalal@unich.it

² Trinity Business School, Trinity College Dublin, The University of Dublin Ireland. Email: francesca.dipietro@tcd.ie

³ University of Padua, Department of Economics and Mananent "M.Fanno" ,Italy
Email: simona.leonelli@unipd.it

Abstract

The existing studies underline the relationship between individual behavior and market information on investment decisions. However, to our knowledge, few studies investigated this relationship in the field of cryptocurrencies. Cryptocurrencies are hybrid assets with high volatility. This paper explores the impact of investors' risk attitude and market information on cryptocurrency investment using an experimental research design. We employed 185 Master students in our experiment. We tested our model through a probit regression, and results indicate that investors' risk attitudes and market information positively impact investment in cryptocurrencies. Our study contributes to behavioral finance literature on risk attitude and market information related to cryptocurrencies.

Keywords: Investor risk behavior; Market information; Cryptocurrencies; Investment's decision; experiment design; logit-probit

1 Introduction

Cryptocurrencies are hybrid assets with high volatility, making them higher-risk investments than other financial assets [1]. They entered the financial market in 2008 with the creation of bitcoin. From 2008-2014, investors gave little attention to bitcoin and other cryptocurrencies due to a lack of understanding and regulators' campaigns branding cryptocurrencies as a new potential asset bubble. Between 2014-2015, the

increase in bitcoin trading has created a debate in academics; researchers started to explore the market nature and how it reacts to information. The efficient market hypothesis [2–4] illustrates that information availability enables security prices to increase or decrease. Thus, investors’ decision to invest is also influenced by information available in the market [3, 5–7]. Post-2015, cryptocurrency trading increased, inflating prices and increasing market share.

Because of their low transaction costs, peer-to-peer transaction networks, and lack of control, cryptocurrencies have grown in popularity among users, rapidly expanding their market size. This rapid growth has resulted in high volume trading, market bubbles, high volatility, and market herding [8, 9]. Nevertheless, bitcoin prices have been rising since 2014, and this trend has continued through the middle of 2018. According to Frisby [10], Bitcoin appears to possess the characteristics of money while also providing additional benefits. It can operate as a value shop due to its mining process and limited supply. In addition, its resilience, divisibility, portability, increased liquidity, and lower transaction costs enable the market to function. Bitcoin and other cryptocurrencies suffered a setback in the early stages of the COVID-19 pandemic, like the stock market and other commodities. However, after October 2020, the bitcoin price increased to more than \$33,000, indicating that COVID-19 boosted the cryptocurrency market compared to different financial needs [7].

Therefore, this paper aims to address the following research question: *How do investor’s risk attitudes and market information impact cryptocurrency investment decisions?*

In the behavioral finance domain, investors’ behavior is the main debated topic to understand how investment decisions are managed [11]. Previous studies underline that investment decisions depend on investors’ risk attitude, market factors, and asset types. Investors are sensitive to loss and respond quickly in uncertain conditions to reduce losses. Risk attitude configures investors’ risk-response behavior [12] and refers to the risk-taking propensity of the individuals to either engage in or avoid making risky choices [13]. Risk-seeker individuals may prefer risky choices with higher returns than those who are risk-averse. Market factors - such as market information of financial or non-financial nature, trading forces, regulations, and legislation - help to devise an effective investment plan in such conditions. Market information refers to the “information related to a firm, asset, or brand linked to ethical, socio-technological, or financial aspects” [14]. Finally, asset types generally include equities, bonds, currencies, commodities, and other assets. Bitcoin’s classification as a commodity by US CFTC¹ has opened a new market with investment opportunities [15].

However, these studies have not observed how individual behavior is related to cryptocurrencies. We fill this gap by analyzing the relationship between investors’ risk attitude and market information on cryptocurrencies investment. In detail, our hypotheses are:

Hp 1: Risk attitude has a significant impact on cryptocurrency investment decisions.

¹ “In September 17, 2015 United States “Commodity Future Trading Commission (CFTC)” released a press release (No. 7231-15) in which it recognized Bitcoin and other cryptocurrencies as commodity in US territory. <https://www.cftc.gov/PressRoom/PressReleases/pr7231-15>”

Hp 2: Market information has a significant impact on cryptocurrency investment decisions.

We conduct our research by targeting prospective investors using an experimental research design. According to Miller [16] experimental markets are the best method to explain the relationship between our variables. We target 185 Master's students who have studied investment and portfolio management courses at PMAS-Arid Agriculture University in Pakistan. The experiment started at the end of March 2020 till the end of August 2020. Our results confirm that the risk attitude and market information influence investor decisions. Our study contributes to behavioral finance literature focusing on personal factors [13, 17], investment, and risk attitude [18, 19].

2 Methods and Data

2.1 Data collection

We conducted an experimental study at PMAS-Arid Agriculture University in Pakistan targeting master students and examining risk attitude and market information impact on cryptocurrency investment. The sample was composed of 185 master students. 41.62% identified themselves as female, whereas the remaining 58.38% recorded themselves as males. 70.27% of respondents are between 20 and 24 years old, and 29.73% reported being between 25 and 30 years old. Around 44.32% of students stated they work part-time. The study was approved by the tutor of the class. Before administering the experiment, students were informed by the tutor about the survey in Urdu and English language. We explained the possible situations in the market related to cryptocurrencies, and we asked them to create a portfolio based on provided percentages by considering three out of four cryptocurrencies. Also, participants were informed that their responses would be kept private and not be subjected to any academic scoring. Further, we stated that this experiment has no right or wrong answer in instructions, but their responsible thinking would be highly appreciated. Finally, we provided the instructor with the link to the experimental survey. The survey was sent to all participants, and their responses were collected automatically.

2.2 Data measurement and methodology

Based on the research question, cryptocurrency investment is our dependent variable. Investor risk attitude and market information are independent variables. Whereas age, gender, part-time work portfolio risk, and reputation are control variables. Post survey, we screened all information to calculate the study variables mentioned. Table 1 explains the coding, definitions, and description of the study variable.

Table 1: Coding, definition, and description of study variables

Variables	Definition	Variable type	Description	Source
Dependent variable				
Cryptocurrency Investment	Number of investments in cryptocurrencies.	Dummy variable	1= Buy 0= Sell	Survey
Independent variables				
Risk attitude	Individual propensity towards risk [20, 21]	Dummy variable	1= High risk-taking 0= Low risk-taking	Survey
Market Information	Financial information available related to cryptocurrencies	Dummy variable	1= Positive information 0= Negative Information	Survey
Control variables				
Portfolio Risk	Risk associated with the combination of cryptocurrencies [22]	Dummy variable	1= High risky portfolio combination 0= Low risky portfolio combination	Survey
Reputation	Psychological factors explaining investor perception towards cryptocurrencies based on market information and news and public opinion [23].	Dummy variable	1= Positive reputation 0= Negative reputation	Survey
Gender	Identified sex of the participant.	Dummy variable	1= Male 0= Female	Survey
Age	Age of participants	Multinomial Variable	0= 20-24 years 1=25-30 years	Survey
Part-time work	Participants working condition	Dummy variable	1= Full-time student 0= Part-time worker	Survey

In the first step, we used this information to calculate the portfolio risk of each investor. After that, we classified their choices in risk levels (i.e., high and low risk) based on market information related to each cryptocurrency. We generated a risk attitude dummy that captures investor risk by investing in cryptocurrencies with higher or lower risk. We recorded individuals who actively invested in risky cryptocurrencies as “1” and “0” otherwise. In the second step, we asked respondents to decide between buying or selling their cryptocurrencies by providing them buying and selling rates. In the second step, we asked them to choose between buying or selling their cryptocurrencies by providing them buying and selling rate. We evaluated investments in cryptocurrencies through this step, considering those who decided to retain cryptocurrencies, investing for a long-term perspective. Blajer-Gołębiewska and Kos [24] used a similar technique to measure investment decisions in their study. Also, we asked subjects whether they trust cryptocurrencies to analyze the reputation, which is a control variable. In order to predict the cryptocurrency investment decisions, we apply a probit model following prior studies [24–26]. The model reported in equation 1 analyzes the impact of risk attitudes and market information on cryptocurrency investment decisions.

$$CInvD_i = \beta_0 + \beta_1 RiskA_i + \beta_2 MKTINF_i + Controls_i + \varepsilon_i \quad (1)$$

Where “CInvD” is cryptocurrency investment decisions, “RiskA” is risk attitude, “MKTINF” is market information.

3 Results

We ran probit regression based on the investment that states the buying and selling of cryptocurrencies to answer our research questions. Table 2 reports our results; Model 1 (M1) considers only the relation between the dependent variable and our controls, while in Model 2 (M2), the independent variables are included. The probit model is significant as the χ^2 probability is less than 0.01, with McFadden’s pseudo R^2 at 0.491 level. Our results highlight that investor’s risk attitude is significant (1.244, $p < 0.01$), showing that investors’ risk attitudes positively impact the decision to make a risky investment, allowing us to accept hypothesis 1. This means a 1% increase in risk attitude (risk-seeking), there are chances of increasing cryptocurrency investment by 1.244. The higher the risk-taking attitude, the higher would be the chances of investment in cryptocurrencies. We also found that market information positively impacts investment in cryptocurrencies (0.739, $p < 0.05$), which means a 1% increase in positive market information causes an increase in cryptocurrency investment by 0.739. Thus, in light of the above result, hypothesis 2 is supported. Similarly, more accessibility to market information will have a positive effect on investment intentions. We

also find that only portfolio risk has a significant impact on cryptocurrencies investment comparison to other control variables, which are not significant.

Table 2: Probit Model

Cryptocurrency investment	M ₁	M ₂
Attitude Toward Risk	-	1.244*** (0.318)
Market Information	-	0.739** (0.212)
Control variables		
Portfolio Risk	0.462* (0.255)	0.800*** (0.256)
Reputation	-0.091 (0.152)	-0.178 (0.162)
Gender	-0.412 (0.274)	-0.33 (0.285)
Age	0.072 (0.269)	0.110 (0.245)
Part-time work	-0.210 (.248)	-0.251 (0.256)
Constant	1.251*** (0.492)	0.850 (0.543)
Prob > χ^2	0.000	0.000
Pseudo R ²	0.350	0.491
Where, n=185, ***p<0.01, **p<0.05, *p<0.1, standard errors are reported in parenthesis.		

3.1 Robustness check

Further, we performed a robustness check by employing Ordinary Least Square (OLS) as the probit model relies on binary outcome variables. For OLS, we calculated

investment as the sum of cryptocurrencies invested. We ensured our robustness check validity by performing OLS diagnostic testing. The diagnostic testing indicated no presence of multicollinearity, heteroskedasticity, and autocorrelation. Our OLS model predictability is approximately 56% and is fit for robustness check. Table 3 reports our results; Model 1 (M1) considers only the relation between the dependent variable and our controls, while in Model 2 (M2), the independent variables are included. Results indicate that risk attitude has a significant and positive impact on cryptocurrency investments. Similarly, market information significantly positively impacts investments in cryptocurrencies. In total, our results confirm that risk attitude and market information have a positive influence on cryptocurrencies.

Table 3: OLS Outcomes

Cryptocurrency investment	M ₁	M ₂
Attitude Toward Risk	-	0.377*** (0.101)
Market Information	-	0.128* (0.067)
Control variables		
Portfolio Risk	0.154*** (0.052)	0.120*** (0.048)
Reputation	0.023 (0.062)	0.021 (0.060)
Gender	0.037 (0.107)	0.063 (0.102)
Age	0.046 (0.104)	0.046 (0.099)
Part-time work	0.293*** (0.101)	0.284 (0.096)
R ²	0.384	0.567
F-stat	3.61***	5.082***
Durbin-Watson stat	1.91	1.97
Where, n=185, ***p<0.01, **p<0.05, *p<0.1. Standard errors are reported in parenthesis.		

4 Discussion

Cryptocurrencies have seen immense growth in recent years. Due to prompt profit-making image, investors are attracted to cryptocurrencies which increased the market share of cryptocurrencies. The paper analyzed how risk attitude and market information impacted cryptocurrency investment decisions. Our results underlined that the higher

the risk-taking attitude, the higher the chances of invest in cryptocurrencies. This finding is in line with the study of Mayfield et al. [13], reporting that individuals who are hesitant to take risks avoid risky investment compared to risk seekers. However, our contribution to the literature relies on the use of cryptocurrencies as an investment decision. We also answer the call for further studies investigating the relationship between personal factors and cryptocurrencies [8, 9, 13, 17].

Furthermore, our results underlined that the higher the market information, the higher the chances of invest in cryptocurrencies. This result is in line with the study of Blajer-Gołębiewska and Kos Blajer-Gołębiewska and Kos (2016) reporting that investors are more sensitive to market information. Generally, rational investors use financial indicators to evaluate a security performance and make investment decisions after processing the maximum amount of information available [27]. However, when investors lack information, the investment may follow a so-called “herd behavior” [9] which can be observed in uncertain markets and assets. This result also contributes to the investment and risk attitude literature, answering the call of more studies in the field of investment behavior related to cryptocurrencies [18, 19].

Although our experimental design was focused on only one specific group of students from one university, future studies may build on and increase the generalizability of our results using heterogeneous multi-groups. Further, we used experimental design-based research, future studies can use the experiential learning method by collecting data at two different points of time for examining trends and the role of financial education.

5. Conclusion

Investor behavior is widely linked with personal and market factors [28, 29]. Through an experiment, we investigated the influence of investor risk attitude and market information on cryptocurrency investment. Results showed that investors who like to take risks might invest in risky securities like cryptocurrencies. Similarly, we found that market information also has a positive influence on investment in cryptocurrencies.

References

1. Demir, E., Gozgor, G., Lau, C.K.M., Vigne, S.A.: Does economic policy uncertainty predict the Bitcoin returns? An empirical investigation. *Finance Research Letters*. 1–5 (2018). <https://doi.org/10.1016/j.frl.2018.01.005>
2. Fama, F.E.: Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*. 25, 383–417 (1970). <https://doi.org/10.1111/j.1540-6261.1970.tb00518.x>
3. Jalal, R.N.-U.-D., Leonelli, S.: Does self-attribution impact investor perception about cryptocurrency market efficiency? Mediating role overconfidence in the relation of self-attribution with perceived market efficiency. In: *ITAIS2020: XVII CONFERENCE OF THE ITALIAN CHAPTER OF AIS* -

ORGANIZING IN A DIGITIZED WORLD: DIVERSITY, EQUALITY AND INCLUSION (2020)

4. Jalal, R.N.-U.-D., Sahar, N.U.: Asian Emerging Market Perspective of Macroeconomic Factors , Stock Return , and Volatility. *International Journal of Management*. 11, 1456–1475 (2020). <https://doi.org/10.34218/IJM.11.8.2020.133>
5. Dyhrberg, A.H.: Hedging capabilities of bitcoin. Is it the virtual gold? *Finance Research Letters*. 16, 139–144 (2016). <https://doi.org/10.1016/j.frl.2015.10.025>
6. Jalal, R.N.-U.-D., Zeb, N., Fayyaz, U.E.R.: The effect of personality traits on employee job satisfaction with moderating role of islamic work ethics. *Journal of Asian Finance, Economics and Business*. 6, 161–171 (2019). <https://doi.org/10.13106/jafeb.2019.vol6.no2.161>
7. Jalal, R.N.U.D., Alon, I., Paltrinieri, A.: A bibliometric review of cryptocurrencies as a financial asset. *Technology Analysis and Strategic Management*. 0, 1–16 (2021). <https://doi.org/10.1080/09537325.2021.1939001>
8. Jalal, R.N.-U.-D., Sargiacomo, M., Sahar, N.U.: Commodity Prices , Tax Purpose Recognition and Bitcoin Volatility : Using ARCH / GARCH Modeling. *Journal of Asian Finance, Economics and Business*. 7, 251–257 (2020). <https://doi.org/10.13106/jafeb.2020.vol7.no11.251>
9. Jalal, R.N.-U.-D., Sargiacomo, M., Sahar, N.U., Fayyaz, U.: Herding Behavior and Cryptocurrency : Market Asymmetries ., *Journal of Asian Finance, Economics and Business*. 7, 27–34 (2020). <https://doi.org/10.13106/jafeb.2020.vol7.no7.027>
10. Frisby, D.: *Bitcoin: the future of money?* Unbound Publishing (2014)
11. Wilt, J., Oehlberg, K., Revelle, W.: Anxiety in personality. *Personality and Individual Differences*. 50, 987–993 (2011). <https://doi.org/10.1016/j.paid.2010.11.014>
12. Murad, Z., Sefton, M., Starmer, C.: How do risk attitudes affect measured confidence? *Journal of Risk and Uncertainty*. 52, 21–46 (2016). <https://doi.org/10.1007/s11166-016-9231-1>
13. Mayfield, C., Perdue, G., Wooten, K.: Investment management and personality type. *Financial Services Review*. 17, 219–236 (2008)
14. Barnett, M.L., Jermier, J.M., Lafferty, B.A.: Corporate Reputation: The Definitional Landscape. *Corporate Reputation Review*. 9, 26–38 (2006). <https://doi.org/10.1057/palgrave.crr.1550012>
15. Corbet, S., Lucey, B.M., Urquhart, A., Yarovaya, L.: Cryptocurrencies as a Financial Asset: A Systematic Analysis. *International Review of Financial Analysis*. 62, (2019). <https://doi.org/10.2139/ssrn.3143122>
16. Miller, G.J.: The Impact of Economics on Contemporary Political Science. *Journal of Economic Literature*. 35, 1173–1204 (1997)
17. Oehler, A., Wendt, S., Wedlich, F., Horn, M.: Investors' Personality Influences Investment Decisions: Experimental Evidence on Extraversion and Neuroticism. *Journal of Behavioral Finance*. 19, 30–48 (2018). <https://doi.org/10.1080/15427560.2017.1366495>

18. Forgas, J.P., George, J.M.: Affective influences on judgments and behavior in organizations: An information processing perspective. *Organizational Behavior and Human Decision Processes*. 86, 3–34 (2001). <https://doi.org/10.1006/obhd.2001.2971>
19. Murad, Z.: Does group discussion lead to better informed and more strategic market entry decisions? *Economics Letters*. 144, 25–28 (2016). <https://doi.org/10.1016/j.econlet.2016.04.032>
20. Bo, H., Sterken, E.: Attitude towards risk, uncertainty, and fixed investment. *North American Journal of Economics and Finance*. 18, 59–75 (2007). <https://doi.org/10.1016/j.najef.2006.09.001>
21. Gloede, O., Menkhoff, L., Waibel, H.: Risk attitude and risk behavior: Comparing Thailand and Vietnam. In: *Proceedings of the German Development Economics Conference, Berlin 2011, No. 33*. ZBW - Deutsche Zentralbibliothek für Wirtschaftswissenschaften, Leibniz-Informationszentrum Wirtschaft, Kiel und Hamburg, Berlin (2011)
22. Guesmi, K., Saadi, S., Abid, I., Ftiti, Z.: Portfolio diversification with virtual currency: Evidence from bitcoin. *International Review of Financial Analysis*. 1–7 (2018). <https://doi.org/10.1016/j.irfa.2018.03.004>
23. Blajer-gołębiewska, A.: Do Stock Exchange Indices Based on Reputational Factor Matter? *International Journal of Academic Research*. 6, 227–231 (2014). <https://doi.org/10.7813/2075-4124.2014/6-4/B.35>
24. Blajer-Gołębiewska, A., Kos, M.: Investors are more sensitive to information about financial rather than ethical reputation of a company: Evidence from an experimental study. *Economics and Sociology*. 9, 11–22 (2016). <https://doi.org/10.14254/2071-789X.2016/9-1/1>
25. Bonsang, E., Dohmen, T.: Risk attitude and cognitive aging. *Journal of Economic Behavior and Organization*. 112, 112–126 (2015). <https://doi.org/10.1016/j.jebo.2015.01.004>
26. Ullah, R., Shivakoti, G.P., Ali, G.: Factors effecting farmers' risk attitude and risk perceptions: THE case of Khyber Pakhtunkhwa, Pakistan. *International Journal of Disaster Risk Reduction*. 13, 151–157 (2015). <https://doi.org/10.1016/j.ijdrr.2015.05.005>
27. Bouri, E., Gupta, R., Roubaud, D.: Herding behaviour in cryptocurrencies. *Finance Research Letters*. 0–1 (2018). <https://doi.org/10.1016/j.frl.2018.07.008>
28. Mushinada, V.N.C., Veluri, V.S.S.: Elucidating investors rationality and behavioural biases in Indian stock market. *Review of Behavioral Finance*. 11, 201–219 (2019). <https://doi.org/10.1108/RBF-04-2018-0034>
29. Vidal-Tomás, D., Ibáñez, A.M., Farinós, J.E.: Herding in the cryptocurrency market: CSSD and CSAD approaches. *Finance Research Letters*. 1–6 (2018). <https://doi.org/10.1016/j.frl.2018.09.008>