Herd Behaviour in Cryptocurrency Markets

Completed research paper

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Abstract

Cryptocurrency markets are highly volatile, with significant and sudden price shifts often influenced by investor sentiment. We demonstrate the significant role of herd behaviour in influencing positive attitudes and subsequent behaviour in cryptocurrency purchasing. Through a survey of 130 active cryptocurrency investors, we empirically examine the factors which influence attitudes and behaviours. Our results indicate that perceived behavioural control, social norms, and propensity to imitate others, a dimension of herd behaviour, strongly influence attitudes towards cryptocurrency behaviour and subsequent behaviours. These findings provide new insights into some of the psychological factors involved in the decision to invest in cryptocurrency and help to understand the unpredictable cryptocurrency market environment.

Keywords blockchain, cryptocurrency, bitcoin, human behaviour, herding, investment

1. Introduction

Cryptocurrencies burst into the headlines in late 2017 when the price of the Bitcoin skyrocketed over USD\$20,000. While there had been moderate interest in some circles since its inception in 2008, it was this dramatic price shift that propelled cryptocurrency into the attention of a much wider audience. Proponents of cryptocurrency often view it as a means to strengthen individual freedom by providing a method to exchange a form of currency anonymously – that is, without the oversight of any third party, though it is also commonly associated with illicit purchasing on nefarious dark-web sites such as SilkRoad (Trautman 2014). The peak of 2017 was soon followed by a dramatic price crash in early-2018, strengthening the arguments that cryptocurrency is incredibly volatile Bohr and Bashir (2014).

Calderón (2018) argues that such volatility is an outcome of a behaviour known as herding. This is an attempt to explain why markets have peaks and troughs, especially when there appears to be no other known factor. For a herding event to occur, there needs to be a form of catalyst for the event. In the case of cryptocurrency and blockchain, this activity may be fuelled by the plethora of websites and social media filled with possibly biased information, often geared toward obtaining a financial benefit for those sharing this information.

Examination of herd behaviour on cryptocurrency has been approached in prior work from differing perspectives. Poyser (2018) examines the herding phenomena by drawing parallels to economic theory through empirical research. Haryanto et al. (2020) likewise apply economic theory to cryptocurrency markets, however, specifically examines how the disposition effect (that is, the reluctance to realise losses while being eager to realise gains) impacts the influence of herding. A further empirical examination of how bullish and bearish markets impact herding on cryptocurrencies is undertaken by Kyriazis (2020).

Our work is differentiated from prior work through our theoretical grounding of herd behaviour with respect to the Theory of Planned Behaviour where we seek to understand the individual drivers of cryptocurrency behaviour. Our research is guided by one central research question:

What, if any, influence does herd behaviour have on cryptocurrency purchase attitudes and behaviours?

To understand this research question, we leverage the Theory of Planned Behaviour (Ajzen 1991) to explore the constructs of perceived behavioural control, subjective knowledge, and subjective norms and their impacts on attitude formation towards cryptocurrency investment. Furthermore, the research in this paper explores the attitude-behaviour construct with respect to cryptocurrency investment, as described by Davidson and Jaccard (1979), to understand the degree to which attitude informs behaviour in cryptocurrency investment.

2. Theoretical Framework and Research Hypotheses

To understand the role of herding, we model the factors that influence attitudes, and the relationship of that attitude and behaviour when investing in cryptocurrency. We build upon prior work which has explained this attitude-behaviour relationship in related domains. Notably, Gamel et al. (2017) investigated various factors that affected attitudes, including subjective norms, in shaping people's attitudes to certain investments.

When we review the aspect of attitude and its effect on behaviour, the literature provides support for a measurable correlation between the two. Prior research suggests that when a subject exhibits attitudes relevant to the behaviour, that there is a strong relationship to performing that behaviour (Davidson and Jaccard 1979; Glasman and Albarracin 2006; Prislin 1987).

Our research also builds on the well-established arguments posed by Ajzen and Fishbein (1980) in the Theory of Reasoned Action (TRA). The TRA sought to understand and define the relationship between a person and their beliefs, attitude, intention, and ultimately, the behaviour towards the object. The TRA describes a "causal sequence" (Thomas Sarver Jr 1983) that is first defined in a subject's attitude, their subjective norm (societal norms) to explain an intention to act (Thomas Sarver Jr 1983). Ajzen (1991) then further extended the TRA by developing the Theory of Planned Behaviour to define a conceptual model to understand the "complexities of human social behaviour" (Ajzen 1991).

2.1. Attitude towards Cryptocurrency Investment

Ajzen and Fishbein (1980) posit that A*ttitude* is the feeling of favourableness towards an object. Furthermore, by forming an attitude regarding an object, individuals are also inclined to exhibit behaviour towards interacting with the object (Lee and Tsai 2010). Research by Davidson and Jaccard (1979) as well as Liska (1974) proposes that there is a direct causal path between attitude and behaviour when the individual's attitudes are in the context of a behaviour. Therefore, we model attitudes towards cryptocurrency investment as a direct influence on the corresponding behaviour i.e. to invest in cryptocurrency.

Glasman and Albarracin (2006) argue that the relationship correlation between attitude and behaviour is strongest where there is direct experience with the behaviour. Prior research of studies of playing online games (Lee and Tsai 2010), Bitcoin transaction adoption (Walton and Johnston 2018; Yoo et al. 2019) as well as gambling (Flack and Morris 2017) all reference attitude as being a significant influence and precursor of behaviour. Thus, we hypothesize that attitude towards cryptocurrency will directly influence investment behaviours:

H1: Attitude toward cryptocurrency investment will positively influence behaviour to invest in cryptocurrency.

2.2. Subjective Norm

Subjective Norm is often modelled in research that aims to explain adoption rates, behaviours, and consumption in the context of new or emerging technologies (Sivo et al. 2007). Most of the existing literature incorporating Subjective Norm is based on the well-known models of the Theory of Planned Behaviour (TPB) and the Technology Acceptance Model (TAM). In these models, Subjective Norms are more typically hypothesised to influence behaviour through the mediating construct of intention rather than Attitude. The Subjective Norm-Attitude relationship is explored by Sivo et al. (2007) to explain usage rates of software utilisation by university students. It is argued by Sivo et al. (2007) that a Subjective Norm is a significant predictor of attitudes. This is in contrast to the finding of Taylor and Todd (1995) whereby they found that Subjective Norm did not have an overwhelming influence on the determination of IT use; however, they further posit that this was due to a lack of consequences associated with the behaviour. This would infer that for the Subjective Norm to be effective, the person who is performing the behaviour needs to be aware that there is some effect of that behaviour, either positively or negatively. For example, avoiding a queue and jumping to the front of the line could be perceived as being rude by others. The effect of the actioned behaviour (jumping the line) has a consequence on those that are external to the person where the behaviour originated.

Though cryptocurrency has not achieved widespread adoption, it has a committed following within certain smaller groups. Baron et al. (1992) argue that in such small groups, norms among the group are particularly influential and we, therefore, find this area to be of interest in this study. Walton and Johnston (2018) used the Theory of Planned Behaviour in their study of Bitcoin adoption. They found that Subjective Norm has a positive relationship with the adoption of Bitcoin (the behaviour to invest) within society. This result was in line with Ajzen (1991) when it was posited that the higher acceptance of an object by society, the greater the likelihood of a person's behaviour with that object. Further to this, Hyun-Sun and Kwang Sun (2019) found that Subjective Norm had a positive relationship with behaviour when it comes to speculative Bitcoin investing. Therefore, we propose the following hypothesis:

H2: Subjective Norm will positively influence Attitude toward cryptocurrency investment.

2.3. Perceived Behavioural Control

Perceived Behavioural Control is the perception of how easy or difficult it is to perform a behaviour or action (Ajzen 1991). This is similar to self-efficacy, where Bandura (1977) argues the positive relation between the belief that a person can complete a task and the observed performance of completing a task. That is, given that a person has the time, resources, knowledge, and ability at their disposal, that they also require the belief that they are able to execute the behaviour (Steward 2019).

Perceived Behavioural Control is predicated on the perception of being able to complete a task. Though this might not reflect actual control, that is to say, a person may believe that they can perform a behaviour but might not have the resources to actually do so (Ajzen 1991). Without measuring the effect that actual control has on the outcome of behaviour, Ajzen (1991) argues that perceived control is an appropriate substitute when the control the person has on performing is realistic (Ajzen 1985).

The Perceived Behavioural Control and relationship to attitude formation is explored by the following hypothesis:

H3: Perceived Behavioural Control will positively influence Attitude toward cryptocurrency investment.

2.4.   Subjective Knowledge

In a study on product knowledge regarding information systems, Brucks (1985) discusses the topic of how individuals act on the information they have acquired to make future decisions, and more importantly, how they represent their knowledge. *Subjective Knowledge* can be defined as the perception or confidence (Brucks 1985) a person has about what or how much information they know about a subject (Park et al. 1994). Hyun-Sun and Kwang Sun (2019) have studied the mediating behaviour that Subjective Knowledge has on the speculative purchase intentions of cryptocurrency. They found that there was a higher chance of impulsive behaviour when the subjects' exhibited higher levels of Subjective Knowledge. Thus, we hypothesise that

H4: Subjective Knowledge will positively influence Attitude toward cryptocurrency investment.

2.5.   Herding – Imitating Others & Discounting Own Information

Herding is a prominent topic among economic theorists as it can explain why investment markets exhibit bubbles and toughs (Calderón 2018). Furthermore, Heshan (2013) argues that we can consider herding to be a construct of two dimensions: *Imitating Others* and *Discounting Own Information*. By distilling down this measurement into two distinct components, it is possible to understand what, if any, motivation there is towards following the crowd when it comes to cryptocurrency investment.

From a practical perspective of herding, if everyone else in a social group is performing a behaviour, then the perception from a singular person perspective that the action will lead to a negative outcome would be low (Kartasova 2013). We can observe herding when we see groups of people acting on the knowledge of a collective, while simultaneously disregarding their individual insights thus causing a cascade of potentially inaccurate information throughout a population (Banerjee 1992).

A notable historical example that has been suggested as a parallel to the modern cryptocurrency phenomenon is the event known as "tulipmania" where, in 1634, The Netherlands was caught up in a frenzy of buying and selling tulips. The price of tulips began to rise as they suddenly became in-vogue within Dutch society and the demand increased dramatically, to the point where merchants could make fortunes (tens of thousands of dollars per month in modern currency); this culminated in an equally sudden crash and drop in demand when prices plummeted (Garber 1989). In economic terms, this behaviour can be deemed as being irrational and is known to lead bubble and crash scenarios (Haryanto et al. 2020) and is argued by Calderón (2018) to be the same behaviour that is observed within cryptocurrency markets.

> *"Prices of intrinsically useless bulbs could rise so high and collapse so rapidly seems to provide a decisive example of the instability and irrationality that may materialise in asset markets."*
>
> *- Garber (1989)*

Garber (1989) puts forth the notion that the rapid rise and decline in the price of tulips is due to a lack of market regulation in managing the herding behaviour during the mania. Interestingly, this suggestion of regulation is also vehemently opposed in cryptocurrency markets (Bohr and Bashir 2014; Teddy 2017). This stems from the original vision of blockchain to operate independently of central banking oversight and regulation (Nakamoto 2008). The fact that the original Bitcoin white paper was published under a pseudonym reinforces this position of anonymity and de-regulation by design.

Herding requires some sort of catalyst, where knowledge is derived from results or perceived results that then influence the herd. In this case, social media and cryptocurrency news sites (Calderón 2018), have been argued to drive cryptocurrency markets. Users of social networking sites routinely disclose high levels of information about themselves and others, reaching a far wider audience than ever before (Thompson and Brindley 2020). Furthermore, social media is flooded with misinformation (Thompson et al. 2019) and sites which promise "news" may still contain questionable and sometimes misleading information (Craggs 2017) relating to cryptocurrency. By creating an environment with more favourable information towards investing in a cryptocurrency, this may catalyse the decision for potential investors to commit to making an investment purchase. We thus hypothesise that:

H5: Imitating Others will positively influence Attitude toward cryptocurrency investment.

H6: Discounting Own Information will positively influence Attitude toward cryptocurrency investment.

3. Research method and design

Data collection was conducted through an anonymous, online survey administered through the Qualtrics platform in May 2020. As cryptocurrencies are not used or widely understood by the general population, recruitment was conducted through 11 web forums relating to cryptocurrency (Table 1). This ensures that respondents did possess knowledge and normative beliefs about cryptocurrency in general and strengthens the validity of the findings.

Forums used in this survey	
cryptocompare.com (bitcoin)	reddit.com/r/cryptocurrency
cryptocompare.com (xrp)	reddit.com/r/dogecoin
hotcopper.com	reddit.com/r/ethtrader
mastersofcrypto.com	reddit.com/r/redditrxrp
reddit.com/r/bitcoin	whirlpool.com
reddit.com/r/bitcoinmarkets	

Table 1: Cryptocurrency Forums used in Survey

The survey instrument was developed using previously validated scales and included items for each of the six constructs. Behaviour was measured as the frequency of cryptocurrency investment activity ranging from less than annually, to more than daily. This measure was chosen as all respondents were active cryptocurrency investors, generally trading across multiple platforms and currencies. Therefore, the most holistic view of behaviour was deemed to be the frequency at which they transact. All participants were at least 18 years of age and gave their consent before participating in the survey. Participation was encouraged by offering a prize draw, and this was offered in cryptocurrency as a further means to encourage responses from those who genuinely understand the concepts of cryptocurrency investment and trading. Human Research Ethics Committee approval was obtained prior to commencing data collection.

Following a brief section to collect general demographic details, the questions relating to the research model were based on previously validated scales in prior literature and are summarised in Table 2. Note that while these constructs are discussed in various prior work, Table 2 lists the citations for the specific items used in this study. All items were measured on 5-point Likert scales ranging from 1 "Strongly Disagree" to 5 "Strongly Agree". A mean value was then calculated across each of the items for each construct.

Construct	Definition	Source of items
Attitude toward cryptocurrency investment	A reflection on the participants view towards cryptocurrency investment.	Lee and Tsai (2010)
Subjective Norm	The perception of the views on cryptocurrency investment held by an individual's social circle.	Hyun-Sun and Kwang Sun (2019)
Perceived Behavioural Control	The perception of an individual to be able to manage their behaviours relative to cryptocurrency investment.	Taylor and Todd (1995)
Subjective Knowledge	The perception of an individual of their own knowledge of cryptocurrency and cryptocurrency investment.	Hyun-Sun and Kwang Sun (2019)

Imitating Others	The willingness of an individual to follow others in their decision making.	Heshan (2013)
Discount Own Information	The willingness of an individual to disregard their own information, in favour of the knowledge of a collective.	Heshan (2013)

Table 2: Survey Item Sources

4. Results and analysis

The survey was open for 15 days during May 2020 and was able to elicit 201 responses. Out of this, 130 complete and valid responses were received yielding a 64.7% usable response rate.

The survey returned a particularly strong response rate from males (n=126, 96.62%) as opposed to females (n=1, 0.77%) or other (n=3, 2.31%). The largest group of responses was from the 25-34 age bracket (n=46, 35.38%). The 18-24 and 35-44 brackets were also more numerous than other groups (n=31, 25.85%; n=37, 28.46%) There was a low level of participation of the survey in the 45-54, 55-65 and 65+ age brackets (n=7, 5.38%; n=5, 3.85%; n=4, 3.08%). Table 3 depicts the respondent demographic details.

Question	Response	# of Responses	% of Responses
Gender	Male	126	96.92
	Female	1	0.77
	Other	3	2.31
Age	18-24	31	25.85
	25-34	46	35.38
	35-44	37	28.46
	45-54	7	5.38
	55-65	5	3.85
	65+	4	3.08

Table 3: Respondent demographic details

Perceived Behavioural Control was high (4.277/5) indicating respondents felt they were aware of the control they had over their behaviours. The mean of Subjective Knowledge (3.878/5) was high indicating that the overall cohort exhibited high levels of confidence in their understanding of cryptocurrency. Attitude toward cryptocurrency investment returned a moderate mean value (3.298/5) indicating that respondents did not have an overwhelmingly positive or negative attitude towards the activity of cryptocurrency investment. The responses to Imitating Others and Discounting Own Information (2.813/5; 2.579/5) resulted in a lower than neutral mean, indicating that the respondents generally reported low herding behaviour. Subjective Norm returned the lowest mean (2.452/5) and suggested that the respondents did not look to others to influence how or when they invest in cryptocurrency. The findings are summarised in Table 4.

Construct	Minimum	Maximum	Mean	Standard Deviation
Attitude towards cryptocurrency investment	1	5	3.298	1.049
Subjective Norm	1	4.750	2.452	0.865
Perceived Behavioural Control	1	5	4.277	0.881
Subjective Knowledge	1.200	5	3.878	0.871
Imitating Others	1	4.667	2.813	0.964
Discount Own Information	1	4	2.579	0.733

Table 4: Descriptive Statistics

4.1. Determinants of Attitudes towards Cryptocurrency

As the model seeks to predict the influence of multiple variables on a single outcome (investment behaviour), a multiple linear regression analysis was suitable. Before proceeding with the multiple linear regression, the data was first checked to ensure that it met the required quality and assumptions necessary for the statistical test. This is a necessary step to ensure that the multiple regression is accurate and that the results can be interpreted correctly. The independence of observations was assessed by a Durbin-Watson statistic of 1.846. This is sufficiently close to the target value of 2 to conclude that there the observations are independent of one another. Next, the presence of a linear relationship between variables was assessed through visual inspection of a scatter plot containing the unstandardised predicted values and the studentised residuals. When undertaking this visual inspection of the scatter plot of the studentised versus unstandardised predicted values, the shape of the results also indicated homoscedasticity was present in the result set thus satisfying a further requirement for multiple linear regression. Next, the data was assessed to ensure that no two variables were highly correlated with one another. Should this situation occur, it can confound results as it is hard to discern which of these variables is influencing a particular outcome. The collinearity statistics showed that all Pearson correlations between variables were under the 0.7 threshold. Finally, the data was tested for the presence of outliers and normality. As the results were free from standardised residuals greater than ±3 standard deviations, leverage points more significant than 0.2 (Huber 1981), and influential points greater than 1 (Cooks and Weisburg 1982) it can be concluded that there were no significant outliers. A P-Plot reflected that the results are normally distributed, and this satisfied the final step of assumption testing, indicating that the multiple linear regression analysis could proceed. R^2 for the overall model was 27.1% with an adjusted R^2 of 24.2%, a moderate to significant effect, according to Cohen et al. (2013).

Subjective Norm, Perceived Behavioural Control, and Imitating Others were found to be statistically significant influences on Attitude, whereas Subjective Knowledge and Discounting Own Information were not found to be statistically significant.

4.2. Determinants of Cryptocurrency Investment Behaviour

Further regression analysis was conducted to observe any relation between the measured attitudes towards cryptocurrency investment and the cryptocurrency investment behaviour (cryptocurrency investment frequency). Assumption testing was repeated before this statistical analysis. Observations were independent as indicated by the Durban-Watson statistic of 2.063. There was a linear relationship between variables, and homoscedasticity detected by visual inspection of a scatter plot containing the studentised residuals and the unstandardised predicted values. The model passed the multicollinearity test with no correlations greater than 0.7. When testing for outliers, there were no standardised residuals outside the ±3 standard deviations but two studentised deleted residuals fell outside of the allowable ±3 standard deviations, both with a value of 3.13238. These two cases were excluded. Leverage points returned safe values with the greatest value being 0.04 - well under the 0.2 threshold for a safe value (Huber 1981). Analysis of the results of the Cook's Distance test showed no values exceeding the threshold of 1 (Cooks and Weisburg 1982), with the maximum value present in the results being 0.09. A review of the P-Plot showed that results were normally distributed and the analysis proceeded. The multiple correlation coefficient was moderate with a value of 0.406 with the

coefficient of determination (R^2) returning a value of 0.165 with an adjusted R^2 of 0.158; a moderate size effect according to Cohen et al. (2013).

Attitude toward cryptocurrency investment significantly predicted behaviour to invest in cryptocurrency ($F_{(1,126)} = 24.853$, $p < 0.0005$).

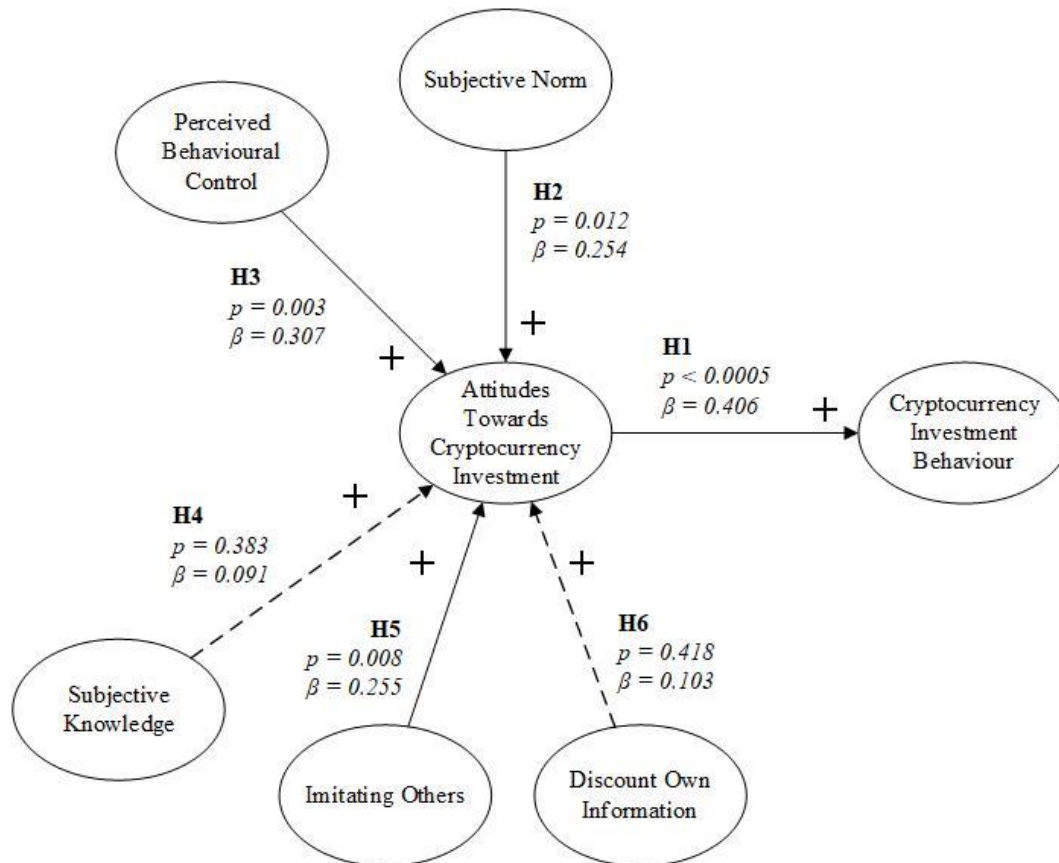The results of the regression testing are summarised below in Figure 1.

Figure 1: Statistical Significance and Standardised Coefficients

5. Discussion

The purpose of this research was to understand what influence Subjective Norm, Perceived Behavioural Control, Subjective Knowledge, Imitating Others, and Discounting Own Information have on Attitude towards cryptocurrency investment. Furthermore, the research sought to understand the degree to which these attitudes influence the behaviour of cryptocurrency investment. Of the 6 hypotheses, 4 were found to be statistically significant, as shown in Figure 1.

Attitudes towards investing in cryptocurrency strongly predicted investment behaviour (the frequency of investment) ($p < 0.0005$), thus supporting H1. The link between attitude and behaviour is one that exists in many contexts, whereby a positive attitude will positively influence the behaviour exhibited by a subject (Davidson and Jaccard 1979; Prislin 1987). This is more often observed when the attitude is in the context of the behaviour, as is the case in this research data. Therefore these findings are supported by prior research which refers to attitudes of consumers as being an indicator of behaviours (Lee and Tsai 2010). The results show that this influence is strong; in fact, it has the highest standardised coefficient among all tested constructs ($\beta = 0.406$).

The influence of Subjective Norms on Attitude toward cryptocurrency investment was also found to be significant ($p = 0.012$), lending support for H2. People have a more positive attitude towards cryptocurrency when their social group of family, friends and peers view cryptocurrency positively. The results provide evidence in support of Walton and Johnston (2018), who demonstrated that people invested in Bitcoin because other people that they knew were also investing in the

cryptocurrency. Hyun-Sun and Kwang Sun (2019) also find that Subjective Norm does have a positive influence on the self-control behaviour of purchasing cryptocurrency.

The influence of Perceived Behavioural Control on Attitude towards cryptocurrency investment was also found to be significant (p = 0.003), supporting H3. Perceived Behavioural Control refers to the perception of a person to control the outcome of their behaviour when they believe they have the time, resources, and knowledge to perform said action and has been influential in prior research on Bitcoin adoption (Walton and Johnston (2018). Our findings are thus consistent with prior research, and the theoretical foundation of our research model. One of the underpinning research models, the Theory of Planned Behaviour, draws a direct influence of Perceived Behavioural Control on the behaviour of the individual (Ajzen 1991). We find a similar influence in our research, through the mediating construct of Attitude with a strong (β = 0.307) relationship between Perceived Behavioural Control and Attitude toward cryptocurrency investment.

Levels of Subjective Knowledge were found not to influence Attitude toward cryptocurrency investment (p = 0.383), leading us to reject H4. This suggests that the level of information that people believe they have on cryptocurrency does not play a role in determining their attitude towards investing in cryptocurrency. This is a relationship that has not been explored in prior research, and the finding poses a new and interesting question: if people are not following their own perceived knowledge of cryptocurrency, then what is convincing people to invest in cryptocurrency? This suggests that there may be other factors at play here, which have a more strongly influential effect. Hyun-Sun and Kwang Sun (2019) showed that Subjective Knowledge of cryptocurrency purchases was associated with higher impulsivity and lower self-control – both reflexive characteristics. This, however, says nothing of the influence on more analytical and calculating decision making and attitude formation. This research population may likely have been more analytically oriented, given that they were active participants of cryptocurrency forums, reading cryptocurrency news, and current events helping them to develop reasoned attitudes over time.

Herding represents followings others, even when persons own information may suggest a different course (Banerjee 1992). Imitating Others, a dimension of herding was found to be influential in predicting Attitude toward cryptocurrency investment, lending support for H5. People who are more aware of others investing in cryptocurrency will have a greater tendency to imitate this behaviour in their investments. This relationship was found to be the second strongest predictor of positive Attitude toward cryptocurrency investment (β = 0.255). When contextualised to the survey population of online cryptocurrency purchasers it is plausible to suggest that what could be occurring is a form of an information cascade, where all members are part of the herd, though as a whole the herd itself may not have a complete understanding of the market, or take into account new information (Heshan 2013).

The second dimension of herding, Discounting Own Information was not found to significantly predict Attitude toward cryptocurrency investment leading us to reject H6. We had hypothesised that attitude formation in cryptocurrency purchases might be influenced by buyers discounting their knowledge to follow others more. This however was not supported. What is particularly interesting in these results is that while we see that the influence of Imitating Others is statistically significant, the population did not appear to be influenced by Discounting Own Information. Prior research has also found that when observing others, discounting one's own information does not always occur, with both Heshan (2013) and Banerjee (1992) arguing that this happens in situations where the views of the respondent are already consistent with the population.

What this research has shown is that herd behaviour is nuanced and not all dimensions may be influential in a certain context. This research has helped to garner an insight into which aspect of herding is at play in the formation of positive attitude toward cryptocurrency investment. The result relating to the imitation of others was statistically significant, while the influence of discounting one's own information was not. This suggests that there is still more to be learned about the human factors which influence how cryptocurrency investment and markets work.

Another interesting aspect of this research is that there was an almost entirely male population (n = 126, 96.92%) present in the demographic. This phenomenon is explored by Eckel and Füllbrunn (2015) and Siquian (2020) and may also shed some light on group behaviour. They argue that financial bubbles are predominately fuelled by males, due to the physiological effect of testosterone on risk-taking propensity. Females, on the other hand, have demonstrated different behaviours, suggesting that any speculative bubbles conducted by women maintained a fair valuation (Eckel and Füllbrunn 2015).

6. Limitations and future work

Cryptocurrency is a relatively new medium where the applications are not widely understood by the general public. The occurrence of bubbles such as those experienced in 2013 and 2017 (Calderón 2018) are often examined when trying to understand the cryptocurrency market, yet no convincing explanation for the volatility has emerged. A lack of regulation is one reason why prices have remained volatile and unpredictable (Yoo et al. 2019). In such an unregulated environment, a picture of a highly emotive market starts to form. One which is driven not only by facts and figures but by individual perceptions and beliefs. The research has generated several opportunities for future work. Notably, a longitudinal study of cryptocurrency investment would provide a more detailed picture of market forces at play, as well as to explore various emotional and psychological factors involved in the decision to invest in cryptocurrency.

The research conducted as part of this paper is limited to cryptocurrency investment forums, and the survey population was typically male. While this does explain some of the observations, it is possible that females do also transact cryptocurrency but that they converse about this investment through other means. Understanding this apparent gender bias in cryptocurrency and how information is shared between genders could help to inform cryptocurrency investment behaviours further and is a promising area for future research.

7. Conclusion

The research described in this paper investigated several factors that influenced attitudes towards investing in cryptocurrency. Furthermore, the study explored how attitudes towards investing in cryptocurrency could predict the behaviour to invest in cryptocurrency. It was found that attitudes to investing in cryptocurrency were a strong predictor of actual investment behaviour. The study also found that these attitudes towards cryptocurrency investment were positively influenced by Subjective Norms, Perceived Behavioural Control, and Imitating Others.

Placing cryptocurrency in the context of traditional investment markets paints a picture of an unregulated, high-risk investment that at the whim of a few who hold a considerable market share or who are deft at communicating and initiating a cascade of information. This research has helped to understand to what degree herding impacts the behaviour to purchase cryptocurrency. While a foreseeable outcome of herding behaviour is cryptocurrency price fluctuation, this research has not directly studied other causes of price fluctuations in cryptocurrency and fiat currency markets. These topics are promising avenues for further research.

The findings in this paper should serve to highlight that despite the well-intentioned creation of this new form of currency, the markets are potentially influenced strongly by human perceptions and beliefs – leaving them open to manipulation and influence. While one could argue that regulation exists in traditional markets to remove such risk, this goes against one of the very tenets of cryptocurrency. Until there is some form of regulation, then the behaviours described in this paper, and market unpredictability, are likely to continue.

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