DeFi era: the behavioral intentions toward cryptocurrency in Lebanon

Ali Abdel Karim Abou Ali
Faculty of Business Administration, Beirut Arab University, Beirut, Lebanon

Abstract

Purpose – This paper examines the factors which impact the behavioral intentions toward cryptocurrency based on signaling theory.

Design/methodology/approach – Data were collected through online questionnaire, and responses from 223 individuals in Lebanon were analyzed through SEM technique using Amos 24.

Findings – The outcomes portrayed the positive effect of perceived benefits and trust in cryptocurrency on behavioral intentions toward cryptocurrency; while not supporting the hypothesized influence of herd behavior and regulatory support.

Originality/value – This paper is among the first studies to adopt Signaling Theory (ST) in the cryptocurrency behavioral intentions research. Moreover, it is of the initial efforts in Lebanon and Middle East in evaluating behavioral intentions to use cryptocurrency, and it provide insights for future researchers, crypto project owners, crypto investors and crypto trading platforms.

Keywords Perceived benefits, Cryptocurrency, Herd behavior, Usage intentions, Regulatory support, Trust in cryptocurrency

Paper type Research paper

Introduction

The cryptocurrency market have developed dramatically through the past decade, as it rose in November 2021 to a new record, realizing a market cap of $3 trillion, as Bitcoin and Etherium rushed to score highs (Lau, 2021). Emerged in 2009, cryptocurrency are decentralized digital currencies using encryption to confirm transactions, it is a digital token formed by cryptographic algorithms and moved through cyberspace and blockchain using protocols (Mazikana, 2018). Blockchain is a database where blocks are added to the chain through mining process, i.e. solving mathematical equations and computational puzzles, where the participant motivation is getting coin rewards and transaction fees (Kjærland, Khazal, Krogstad, Nordstrøm, & Oust, 2019). Cyptocurrency leveraged on blockchain disruptive technology which revolutionized the data structure permitting the formation of decentralized digital ledgers where single entities (i.e. governments, organizations, etc.) could not alter or control transactions on the blockchain (D'Alfonso, Langer, & Vandelis, 2016). These technological proficiencies expedite the one-to-one decentralized monetary dealings without a central payment intermediary party, improving the business effectiveness while lessening the operation time and fee (Alqaryouti, Siyam, Alkashri, & Shaalan, 2020b).

Cryptocurrency trading started in 2013, yet, concerns are raised whether the dynamic behavior of crypto assets is predictable or not; and whether forecasts of the parameters of the crypto market can be utilized in trading strategies for obtaining higher profits (Mikhaylov, Danish, & Senjyu, 2021). As of 2022, the estimated global crypto ownership rates at an

average of 4.2%, with over 320 million crypto users worldwide (TripleA.io, 2022). Decentralized finance (DeFi) might grow into a podium for more progressive, comprehensive, and transparent financial services, which may carry some potential gains for users but also impose financial stability challenges, especially for developing economies where macro-financial risks apply with respect to asset and currency substitution (IMF, 2021).

Users of cyrptocurrency have various objectives, where some are holding the coins as strategic long term digital assets, some are looking to speculate through short term transactions, and others use it for transferring money around the globe. Also, fast transaction speed, low transaction fees, privacy and security are one of the critical benefits behind adopting cryptocurrency (Gao, Clark, & Lindqvist, 2016); compatibility, awareness and facilitating conditions (Ayedh, Echchabi, Battour, & Omar, 2021); in addition to investment opportunities, businesses acceptance, financial and technological knowledge, performance and effort expectancy (Alzahrani & Daim, 2019; McMorrow & Esfahani, 2021).

However, individuals might have little information about this fledgling technology, and this imprecise atmosphere can adversely influence attitudes to accept coins in daily transactions (Daryaei, Jassbi, Radfar, & Khamseh, 2020). Cryptocurrency markets remain tremendously volatile, with noteworthy and unexpected price swings habitually prejudiced by investor psychology; where research indicate that perceived behavioral control, social norms, and herd behavior (i.e. propensity to imitate others) intensely impact cryptocurrency behavior (Boxer & Thompson, 2020). The influence of trust on cryptocurrency behavioral intentions has not been adequately discovered and researchers argue for the high need for trust-building given their unregulated nature (Jalan, Matkovskyy, Urquhart, & Yarovaya, 2022).

Although Crypto adoption in some emerging markets and unindustrialized economies has outpaced that of developed economies (IMF, 2021); very few studies have been steered to explore the causes behind adopting cryptocurrency in the developing regions in Asia (Xiong & Tang, 2020). This study is one response to this need for investigating the motivation behind adopting and using cryptocurrency in the Lebanese market, and will investigate the demographic characteristics of crypto users as well.

Theoretical background and hypotheses development

Intention is "an indication of a person's readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior" (Ajzen, 2019). The research about crypto adoption intention is relatively new, and researchers in this field used many theories as Diffusion of Innovation Theory, Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Technology Acceptance Models (TAM), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Alzahrani and Daim, 2019; Arias-Oliva, Pelegrín-Borondo, & Matías-Clavero, 2019; Ayedh et al., 2021; Boxer and Thompson, 2020; Lou and Li, 2017).

However, as a foundation in developing the conceptual framework of the paper, this study will deploy the Signaling Theory (ST) originally theorized by Spence (1973), where his main idea was that "at the time of hiring an employee, the employer will have conditional assessments and informational gaps over productive capacity of employees; given various combinations of signals and indices (e.g. education); with the fact that it takes time to learn an individual's productive capabilities means that hiring is an investment decision, in addition to the fact that these capabilities are not known beforehand makes the decision one under uncertainty". Signaling theory focuses mainly on the communication of positive information in an effort to convey positive attributes to reduce information gaps or asymmetry; and has been widely used in different fields to explain customer choice phenomenon (Connelly, Certo, Ireland, & Reutzel, 2011).

ST advocates three chief elements, specifically, the signaler (the provider), the receiver (the customer) and the signal (Boateng, 2019). In cyberspace and through online transactions, there exist a large amount of information asymmetry between buyers and sellers in online transactions (Rao, Lee, Connelly, & Iyengar, 2018); where the provider (here could be considered crypto project owners or crypto trading platforms) has access to the product itself and consequently has a significant amount of information that the possible buyer does not have; whereas the user has information about his trading needs which are unknown by the provider.

In this paper, ST will be utilized to explain the types of signals such as perceived benefits and trust offered to users in order to reduce information asymmetry and uncertainty that assist purchasers in making more accurate judgments of value/attributes when there is incomplete info about crypto. The provider in an effort to influence the opinions of buyers, regularly communicates information regarding the attributes to reduce information asymmetries with the intent of impacting buyers perceptions and behavioral intentions (Boateng, 2019).

Trust in crypto

Trust might be viewed as "a relationship between two or more parties, whereby one party-the trustor-voluntary decides under a condition of uncertainty, to rely on another party -the trustee-which can be an individual or institution or a system-for the achievement of a particular task, based on the belief that the latter will perform the task in line with the expectations of the former, thereby putting the trustor in a vulnerable position with regard to the trustee; and blockchain technology enables a shift from trusting people to trusting math" (De Filippi, Mannan, & Reijers, 2020). Cryptocurrency biggest hurdle is the trust of the market, which is affected by price fluctuations and instability; and it is shown in emerging countries that the higher market penetration of crypto, the higher the stability of its value which will upsurge acceptance among individuals as well (Connolly & Kick, 2015). The primary design of crypto is to eliminate the necessity of financial institutions, governments, and trusted third parties; and for instance Bitcoin in its essence increases efficiencies and eliminates the probability of fraud via providing proof of work protocols to guarantee transactions' validity (D'Alfonso et al., 2016). Trust can be seen as "the willingness to take risks based on the belief in, integrity of, competence in and expectations regarding the use of cryptocurrency and is developed based on beliefs regarding the integrity, reliability, trustworthiness, security and privacy of cryptocurrency" (Mendoza-Tello, Mora, Pujol-López, & Lytras, 2019). Trust plays an significant role in promoting innovation (in this case cryptcurrency) when official bodies are absent, and where states of risk and uncertainty exist (Jalan et al., 2022). Earlier research has shown that Trust has a direct significant influence on intention to adopt cryptoassets (Abbasi, Tiew, Tang, Goh, & Thurasamy, 2021; Ayedh et al., 2021; Mendoza-Tello et al., 2019; Voskobojnikov, Abramova, Beznosov, & Böhme, 2021).

Therefore, it is suggested that:

H1. Trust in cryptocurrency will influence positively the behavioral usage intentions of cryptocurrency.

Perceived benefits

Intentions to adopt Cryptocurrency upsurges if additional benefits are apparent from using it (Xiong & Tang, 2020). Obviously the investment opportunity, digitized currency, time and cost of transaction, ease of use, and security are deliberated to be benefits to consider (Gao et al., 2016), in addition to anonymity and universality (Esmaeilzadeh, Cousins, and Subramanian, 2020) Perceived Benefit refers to "an individual's perceptual belief that the use

of Bitcoin (or another cryptocurrency) will result in both direct and indirect positive outcomes" (Abramova and Böhme, 2016). In this study, perceived benefits will be measured by the three first-order constructs: "1) Transaction Processing (TP) comprises transaction related benefits of using cryptcurrency for payments; 2) Security and Control (SC) refers to perceptions about the overall security of the crypto system; 3) Decentralization (DE) conceptualizes beneficial implications of the cryptocurrency core design principle" (Abramova & Böhme, 2016; Alqaryouti, Siyam, Alkashri, & Shaalan, 2020a). The decentralized nature of cryptocurrency is independent from bodies such as governments and international organizations that are not able to impose financial sanctions and embargos which were executed formerly via traditional means (World Economic Forum, 2021). Number of studies showed the positive influence of perceived benefits on adoption intention of cryptocurrency (Alqaryouti *et al.*, 2020b; Esmaeilzadeh *et al.*, 2020; Gazali, 2019; Muchlis Gazali, Hafiz Bin Che Ismail, & Amboala, 2018). Hence, it is hypothesized that:

H2. Perceived benefits will influence positively the behavioral usage intentions of cryptocurrency.

Regulatory support
In response to the financial markets' collapse in 2008, some investors wanted enhanced regulation, firmer capital requirements and higher standards of business disclosure and transparency, while others found the notion of substitute, unregulated, and entirely decentralized financial systems and mechanisms mostly pleasing (Jalan *et al.*, 2022). Regulatory frameworks can be defined as "the degree that an individual perceives that the technology is under the authorities' control" (Daryaei *et al.*, 2020). Crypto makes the cross-border transaction easier and more comfortable with the existence of the ledger, however, it lacks specific regulations that can control it like fiat currencies, and it is no wonder that some people are apprehensive about it. Regulatory risks associated with crypto may influence the attitudes and usage intentions of individuals mainly for reliability matters, and those risks are considered one of the most important barriers for potential users (Esmaeilzadeh *et al.*, 2020).

Regulators and policy makers are evaluating how best to address the novel issues posed by cryptocurrency, which swiftly grew from just a substitute to old-style money and systems, to a well-considered asset to investors, organizations and some countries (World Economic Forum, 2021). One of the main barriers to adopt blockchain tech is the regulatory uncertainties which refers to "the policies and regulations provided by the government to regulate and monitor the industries for the usage of new technology" (Etemadi, Strozzi, Van Gelder, & Etemadi, 2021). With incomplete or insufficient disclosure, the crypto ecosystem is open to users' fraud and marketplace honesty risks due to the fact that most crypto tokens are speculative assets extremely unpredictable, and investors probably face losses from terminated tokens; something that is less common in regulated securities markets (IMF, 2021). Consequently, the study hypothesizes the following:

H3. Regulatory support will influence positively the behavioral usage intentions of cryptocurrency.

Herd behavior
Herding as a behavioral bias gained its popularity after considered to be the motive behind the bursting of dotcom bubble in late 1990, the real estate bubble in 2008, and lately the cryptocurrency bubble during the past few years (Dewan & Dharni, 2019). Herding can be labeled as "a group of investors who ignore their private data and follow the investing behavior of other market members or base their investments on a marketplace accord"

(Chong, Bany-Ariffin, Nassir, & Muhammad, 2019). Herd behavior is present in crypto market, it is robust during ascending market and periods of high instability (Aydın, Agan, & Aydın, 2022). Many studies tested herding behavior in crypto markets and detected empirical evidence pointing to significant herding behavior, which varies over time and depends on levels of uncertainty and turbulence (Ajaz & Kumar, 2018; Bouri, Gupta, & Roubaud, 2019; da Gama Silva, Klotzle, Pinto, & Gomes, 2019; Jalal, Sargiacomo, Sahar, & Fayyaz, 2020). Henceforth, it is hypothesized that:

H4. Herd behavior will influence positively the behavioral usage intentions of cryptocurrency.

Accordingly, the following conceptual framework is suggested by the researcher as illustrated in Figure 1 below:

Research methods
An online questionnaire was developed and distributed to collect data nationwide. Participants are above 18 and reside in Lebanon. The survey link was shared on internet using social media networks and email marketing techniques, until we reached the needed sample size. According to (Start.io, 2022), only 377,031 individuals residing in Lebanon are crypto-users. This study used Covariance-Based Structural Equation Modeling (CBSEM) for statistical analysis, specifically Maximum Likelihood (ML) estimation method – which is of a confirmatory view unlike Partial Least Squares (PLS-SEM) which is of an exploratory view (Barroso, Carrión, & Roldán, 2010). The minimum sample size for structural equation modeling is at least 200 (Civelek, 2018); yet, the final number of responses for this study was 223 responses, and Table 1 shows the profiling of respondents. The questionnaire shows the measurements embraced for assessing the factors affecting crypto usage intention in Lebanon. The items to measure the constructs were sourced from current validated scales in
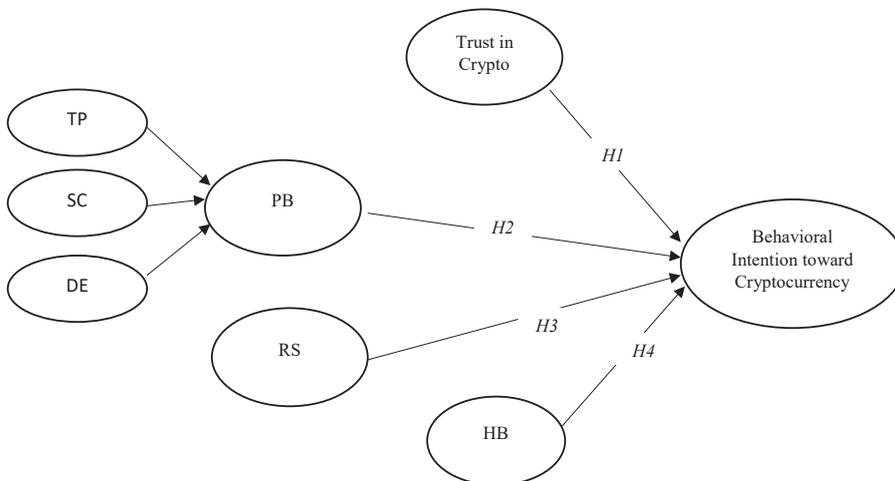
Note(s): TP: Transaction processing; SC: Security and control; DE: Decentralization;
PB: Perceived benefits; HB: Herd behavior; RS: Regulatory support
Source(s): Figure by author

Figure 1.
Conceptual framework

Attribute	Value	Frequency	Percentage (%)
Gender	Male	94	42.2
	Female	129	57.8
Age	18 to 28 years	185	83.0
	29 to 39 years	30	13.5
	40 to 50 years	5	2.2
	51 to 61 years	3	1.3
Marital Status	Divorced	2	0.8
	In a relationship	27	12.7
	Married	30	13.5
	Single	164	73.5
Area	Beirut	80	35.9
	Mount Liban	65	29.1
	Bekaa	12	5.4
	North	17	7.6
	South	49	21.9
Income	<500 $	145	64.6
	500$ - 1500$	43	19.3
	1501$ −2000$	13	5.8
	2000$- 2500$	9	4.0
	2501-3000	3	1.3
	3001-3500	3	1.3
	3501-4000	1	0.4
	more than 4000$	6	2.7
Education	Others	6	2.7
	Bachelor's Degree	183	82.1
	Master's Degree	29	13
	PhD Degree	5	2.2
Preferred platform	Binance	133	59.6
	Binance, Coinbase	4	1.8
	Binance, Coinbase, Kucoin, etoro, others	1	0.4
	Binance, etoro	1	0.4
	Binance, Kucoin	4	1.8
	Binance, others	8	3.6
	Coinbase	17	7.6
	etoro	3	1.3
	Kucoin	7	3.1
	others	45	20.2

Table 1.
Demographic profile of respondents; N = 223   **Source(s):** Table by the author

the literature namely: five items to measure Trust in Cryptocurrency (Mendoza-Tello *et al.*, 2019); nine items to measure perceived benefits (Abramova & Böhme, 2016); two items to measure regulatory support (Amini, 2014); three items for herding behavior (Rejikumar *et al.*, 2022); and five items to measure behavioral Intentions toward Cryptocurrency (Mendoza-Tello *et al.*, 2019).

Data analysis
Assessing the measurement model
To evaluate the construct reliability, composite reliability (CR) and Cronbach's alpha (α) were assessed by the researcher. Table 2 shows the reliability scores where α and CR greater than 0.7. In addition, the paper evaluated the constructs' validity through examining the convergent and discriminant validity. Firstly, a confirmatory factor analysis (CFA) was

Construct	Indicator	Loading	CR	α
Trust in cryptocurrency (Mendoza-Tello *et al.*, 2019)	I believe that electronic payments made with cryptocurrency are integral	0.702	0.795	0.749
	Privacy is guaranteed in each virtual currencies transaction	0.692		
	Security measures provided by cryptocurrency avoid fraud	0.638		
	I believe in the honesty of people that use cryptocurrency	0.618		
	The functionality of wallets is reliable	0.654		
Perceived benefits (Abramova & Böhme, 2016)	*Transaction processing*		0.937	0.900
	With Cryptocurrency, I can instantly transfer money	0.73		
	With Cryptocurrency, I can transfer money worldwide	0.785		
	Cryptocurrency allows me to transfer money with cheaper transaction fees	0.753		
	Cryptocurrency allows me to easily transact money	0.79		
	Security and control			
	Cryptocurrency allows me to transfer money securely	0.837		
	Cryptocurrency enables me to control my money	0.731		
	Decentralization			
	Cryptocurrency decentralization enables me to do transactions faster	0.782		
	With Cryptocurrency, I do not have to deal with any authority	0.711		
	When using Cryptocurrency, there is no central authority that has custody of my deposits	0.66		
Regulation support (Amini, 2014)	The laws and regulations that exist nowadays are sufficient to protect the use of cryptocurrency	0.769	0.778	0.777
	There is legal protection in the use of Cryptocurrency	0.827		
Herding behavior (Rejikumar *et al.*, 2022)	I will follow the majority in my decisions about cryptocurrency	0.673	0.833	0.830
	I feel that accepting views of the majority is riskless	0.71		
	I feel that accepting views of the majority is safe	0.826		
Behavioral intentions toward cryptocurrencies (Mendoza-Tello *et al.*, 2019)	I will always try to use cryptocurrency in my daily life	0.705	0.873	0.871
	I intend to use cryptocurrency to make online purchases	0.672		
	I intend to save using cryptocurrency	0.736		
	I plan to continue to use cryptocurrency frequently	0.86		
	I intend to continue to use cryptocurrency in the future	0.818		

-HTMT scores are below

	PB	TRC	HB	RS	BI
PB					
TRC	0.727				
HB	0.406	0.807			
RS	0.308	0.722	0.649		
BI	0.761	0.756	0.478	0.383	

Source(s): Table by the author

performed to examine the convergent validity of the measures. The outcomes of CFA confirm that model fit indices are within the thresholds criteria CMIN/DF = 1.999, (CFI) of 0.896, (TLI) of 0.89, (RMSEA) of 0.067; showing a reasonable measurement model fit (Doll, Xia, & Torkzadeh, 1994; Hu & Bentler, 1999). The CFA results shows that the factor loadings are all above 0.5 validating the convergent validity of the measurements (Hair, Black, Babin, & Anderson, 2014) as shown in Table 2.

In addition, to assess the discriminant validity of the measurements, this study applied the heterotrait-monotrait ratio (HTMT) of the correlations, which is "the average of the heterotrait-hetero method correlations (i.e. the correlations of indicators across constructs measuring different phenomena), relative to the average of the monotrait-hetero method correlations (i.e., the correlations of indicators within the same construct)" (Henseler, Ringle, & Sarstedt, 2015), and the HTMT scores should be less than 0.85. As shown in Table 2 all the score are not higher than 0.85, proving the discriminant validity of the measurements.

Assessing the structural model
A full structural analysis was made in order to assess the hypothesized relationships between the constructs. Firstly, the structural model fit results (CMIN/DF = 2.645, CFI = 0.836, TLI = 0.818, RMSEA = 0.086) demonstrated a good fit with the data meeting the most accepted benchmarks (Doll *et al.*, 1994; Hu & Bentler, 1999). Moreover, Table 3 presents the estimated values of the standardized regression weights of the relationship model. It is clear that H1 and H2 are accepted hypotheses namely Perceived Benefits ($\beta = 0.621$, $p < 0.001$) which is having the highest influence, followed by Trust in Crypto ($\beta = 0.424$, $p < 0.001$) whereas H3 and H4 are rejected indicating that herd behavior and regulatory support are of no influence on behavioral intentions toward cryptocurrency.

Discussion of results
This study tested a causal model in an attempt to comprehend the behavioral intentions toward cryptocurrency in the Lebanese market. The results indicates that Trust in Crypto and perceived benefits are significant antecedents behavioral intentions toward cryptocurrency; while regulatory support and herd behavior do not possess an influence. The beta score of perceived benefits highlights the vital influence it carries on people intentions. This result matches results of other papers which found that this variable is of high impact on behavioral intentions toward cryptocurrency (Abramova & Böhme, 2016; Alqaryouti *et al.*, 2020a, 2020b; Alqaryouti *et al.*, 2020a, b; Esmaeilzadeh *et al.*, 2020; Gao *et al.*, 2016; Gazali, 2019; Muchlis Gazali *et al.*, 2018). This is a clue that people in Lebanon are mainly driven by benefits of using cryptocurrency rather than something else. Moreover, the results indicated that trust in crypto is influencing the intentions to behave toward cryptocurrency, and this result is similar to earlier mainstream research (Abbasi *et al.*, 2021; Ayedh *et al.*, 2021; Mendoza-Tello *et al.*, 2019; Voskobojnikov *et al.*, 2021).

Hypothesis	Relationship	Std. Beta β	Results
H1	Trust in Crypto → Behavioral Intention	0.424***	Supported
H2	Perceived Benefits → Behavioral Intention	0.621***	Supported
H3	Regulatory support → Behavioral Intention	0.026	Rejected
H4	Herd behavior → Behavioral Intention	−0.014	Rejected

Note(s): ***$p \leq 0.001$, **$p \leq 0.010$, *$p \leq 0.050$, † $p \leq 0.100$
Source(s): Table by the author

Table 3.
Hypotheses testing results

However, herd behavior was found to possess no impact on behavior intentions, and this result contradicts with earlier research (Ajaz & Kumar, 2018; Aydın *et al.*, 2022; Bouri *et al.*, 2019; da Gama Silva *et al.*, 2019; Jalal *et al.*, 2020). This contradiction can be associated with the comprehension that herd behavior is stronger during extreme situations rather than in normal conditions and it is evident only in bull markets versus bear markets (Kyriazis, 2020), and this study was made during a bear market period.

Lastly, the results did not confirm an impact of regulatory support; although earlier papers articulate that regulatory support can help increasing the intentions toward crypto (Etemadi *et al.*, 2021; IMF, 2021). This might be a consequence of users' distrust in their government, and they are searching for new ways to detour the governmental financial routes.

Contributions, limitations and suggestions for future research

The paper attempts to address multiple gaps stated earlier, thus making some contributions theoretically and empirically. First, no previous study to the knowledge of the researcher applied ST theory in cryptocurrency behavioral intentions area of research, and no previous study explored the nominated factors in one research model. Second, the study extends the limited research for understanding the factors affecting behavioral usage intentions in the Middle East region and Lebanon specifically; it is among the first studies in this regard. Third, the outcomes of this research function as an orientation for governments and regulators, crypto project owners, and platform companies. For instance, governments might build on the insights from this study to develop their own central bank digital currencies.

Regarding the study limitations, it should be mentioned that the model was only assessed in the Lebanese market, and other authors may deploy it in cross-cultural dimension with larger data set. Secondly, the domain of herding was examined in a bear market period, thus for future papers it might be investigated in bull market trends; also herding can be inspected in other emerging countries as current literature provides evidence that in developed countries herding is obvious. In future research, other variables could be added to the model to be tested such as financial literacy, perceived ease of use of crypto applications, perceived risk, etc.

References

Abbasi, G. A., Tiew, L. Y., Tang, J., Goh, Y.-N., & Thurasamy, R. (2021). The adoption of cryptocurrency as a disruptive force: Deep learning-based dual stage structural equation modelling and artificial neural network analysis. *PLOS ONE*, *16*(3), e0247582. doi: 10.1371/journal.pone.0247582.

Abramova, S., & Böhme, R. (2016). Perceived benefit and risk as multidimensional determinants of bitcoin use: A quantitative exploratory study. In *International Conference on Information Systems* (pp. 1–20). doi: 10.17705/4icis.00001.

Ajaz, T., & Kumar, A. S. (2018). Herding in crypto-currency markets. *Annals of Financial Economics*, *13*(02), 1850006. doi: 10.1142/S2010495218500069.

Ajzen, I. (2019). Theory of planned behavior. *Theory of Planned Behavior*. Available from: https://people.umass.edu/aizen/tpb.diag.html#null-link.

Alqaryouti, O., Siyam, N., Alkashri, Z., & Shaalan, K. (2020a). Cryptocurrency usage impact on perceived benefits and users' behaviour. In M. Themistocleous, & M. Papadaki (Eds.), *Information Systems* (Vol. 381, pp. 123–136). Springer International Publishing. doi: 10.1007/978-3-030-44322-1_10.

Alqaryouti, O., Siyam, N., Alkashri, Z., & Shaalan, K. (2020b). Users' knowledge and motivation on using cryptocurrency. In M. Themistocleous, & M. Papadaki (Eds.), *Information Systems* (Vol. 381, pp. 113–122). Springer International Publishing. doi: 10.1007/978-3-030-44322-1_9.

Alzahrani, S., & Daim, T. U. (2019). Evaluation of the cryptocurrency adoption decision using hierarchical decision modeling (HDM). In *2019 Portland International Conference on Management of Engineering and Technology (PICMET)* (pp. 1–7). doi: 10.23919/PICMET. 2019.8893897.

Amini, M. (2014). The factors that influence on adoption of cloud computing for small and medium enterprises, [Universiti Teknologi Malaysia]. Available from: http://rgdoi.net/10.13140/RG.2.1. 5007.0889.

Arias-Oliva, M., Pelegrín-Borondo, J., & Matías-Clavero, G. (2019). Variables influencing cryptocurrency use: A technology acceptance model in Spain. *Frontiers in Psychology*, *10*, 475. doi: 10.3389/fpsyg.2019.00475.

Aydın, Ü., Agan, B., & Aydın, Ö. (2022). Herd behavior in crypto asset market and effect of financial information on herd behavior. *SSRN Electronic Journal*. doi: 10.2139/ssrn.4171315.

Ayedh, A., Echchabi, A., Battour, M., & Omar, M. (2021). Malaysian Muslim investors' behaviour towards the blockchain-based Bitcoin cryptocurrency market. *Journal of Islamic Marketing*, *12*(4), 690–704. doi: 10.1108/JIMA-04-2019-0081.

Barroso, C., Carrión, G. C., & Roldán, J. L. (2010). Applying Maximum likelihood and PLS on different sample sizes: Studies on SERVQUAL model and employee behavior model. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of Partial Least Squares* (pp. 427–447). Springer Berlin Heidelberg. doi: 10.1007/978-3-540-32827-8_20.

Boateng, S. L. (2019). Online relationship marketing and customer loyalty: A signaling theory perspective. *International Journal of Bank Marketing*, *37*(1), 226–240. doi: 10.1108/IJBM-01-2018-0009.

Bouri, E., Gupta, R., & Roubaud, D. (2019). Herding behaviour in cryptocurrencies. *Finance Research Letters*, *29*, 216–221. doi: 10.1016/j.frl.2018.07.008.

Boxer, M., & Thompson, N. (2020). Herd behaviour in cryptocurrency markets. 1–12.

Chong, O.-P., Bany-Ariffin, A. N., Nassir, A., & Muhammad, J. (2019). An empirical study of herding behaviour in China's A-share and B-share markets: Evidence of bidirectional herding activities. *Capital Markets Review*, *27*(2), 22.

Civelek, M. E. (2018). *Essentials of structural equation modeling*. Lincoln, NE: Zea Books, available at: https://digitalcommons.unl.edu/zeabook/64/

Connelly, B. L., Certo, S. T., Ireland, R. D., & Reutzel, C. R. (2011). Signaling theory: A review and assessment. *Journal of Management*, *37*(1), 39–67. doi: 10.1177/0149206310388419.

Connolly, A., & Kick, A. (2015). *What differentiates early organization Adopters of bitcoin from non-adopters?* 6.

da Gama Silva, P. V. J., Klotzle, M. C., Pinto, A. C. F., & Gomes, L. L. (2019). Herding behavior and contagion in the cryptocurrency market. *Journal of Behavioral and Experimental Finance*, *22*, 41–50. doi: 10.1016/j.jbef.2019.01.006.

Daryaei, M., Jassbi, J., Radfar, R., & Khamseh, A. (2020). Bitcoin adoption as a new technology for payment mechanism in a tourism collaborative network. In L. M. Camarinha-Matos, H. Afsarmanesh, & A. Ortiz (Eds), *Boosting Collaborative Networks 4.0* (Vol. 598, pp. 167–176). Springer International Publishing. doi: 10.1007/978-3-030-62412-5_14.

De Filippi, P., Mannan, M., & Reijers, W. (2020). Blockchain as a confidence machine: The problem of trust & challenges of governance. *Technology in Society*, *62*, 101284. doi: 10.1016/j.techsoc.2020. 101284.

Dewan, P., & Dharni, K. (2019). Herding behaviour in investment decision Making.pdf. *British Journal of Economics, Management & Trade*, *24*(2), 1–12, doi: 10.9734/jemt/2019/v24i230160.

Doll, W. J., Xia, W., & Torkzadeh, G. (1994). A confirmatory factor analysis of the end-user computing satisfaction instrument. *MIS Quarterly*, *18*(4), 453. doi: 10.2307/249524.

D'Alfonso, A., Langer, P., & Vandelis, Z. (2016). *The future of cryptocurrency an investor's comparison of Bitcoin and ethereum*. Toronto: Ryerson University.

Esmaeilzadeh, P., Cousins, K., & Subramanian, H. (2020). A utility theory model for individual adoption of bitcoin. In *CONF-IRM 2020 Proceedings* (Vol. 14).

Etemadi, N., Strozzi, F., Van Gelder, P., & Etemadi, T. (2021). An ISM modelling of success factors for blockchain adoption in a cyber secure supply chain. In *2021 The 4th International Conference on Computers in Management and Business* (pp. 65–72). doi: 10.1145/3450588.3450600.

Gao, X., Clark, G. D., & Lindqvist, J. (2016). Of two minds, multiple addresses, and one ledger: Characterizing opinions, knowledge, and perceptions of bitcoin across users and non-users. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (pp. 1656–1668). doi: 10.1145/2858036.2858049.

Gazali, H. M. (2019). Bitcoin investment behaviour: A pilot study. *International Journal on Perceptive and Cognitive Computing (IJPCC)*, *5*(2), 6.

Hair, J. F., Black, W., Babin, B., & Anderson, R. (2014). *Multivariate data analysis* (7th ed.), Pearson new internat. Pearson.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115–135. doi: 10.1007/s11747-014-0403-8.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. doi: 10.1080/10705519909540118.

IMF. (2021). *The crypto ecosystem and financial stability challenges*. Washington, DC: International Monetary Fund.

Jalal, R. N.-U.-D., Sargiacomo, M., Sahar, N. U., & Fayyaz, U.-E.-R. (2020). Herding behavior and cryptocurrency: Market asymmetries, inter-dependency and intra-dependency. *The Journal of Asian Finance, Economics and Business*, *7*(7), 27–34. doi: 10.13106/JAFEB.2020.VOL7.NO7.027.

Jalan, A., Matkovskyy, R., Urquhart, A., & Yarovaya, L. (2022). The role of interpersonal trust in cryptocurrency adoption. *SSRN Electronic Journal*. doi: 10.2139/ssrn.4099518.

Kjærland, F., Khazal, A., Krogstad, E., Nordstrøm, F., & Oust, A. (2019). An analysis of bitcoin's price dynamics. *Journal of Risk and Financial Management*, *11*(4), 63, doi: 10.3390/jrfm11040063.

Kyriazis, N. A. (2020). Herding behaviour in digital currency markets: An integrated survey and empirical estimation. *Heliyon*, *6*(8), e04752. doi: 10.1016/j.heliyon.2020.e04752.

Lau, Y. (2021). Cryptocurrencies hit market cap of $3 trillion for the first time as Bitcoin and Ether reach record highs. Fortune.Com. Available from: https://fortune.com/2021/11/09/cryptocurrency-market-cap-3-trillion-bitcion-ether-shiba-inu/

Lou, A. T. F., & Li, E. Y. (2017). Integrating innovation diffusion theory and the technology acceptance model: The adoption of blockchain technology from business managers' perspective. *4*.

Mazikana, A. T. (2018). The impact of cryptocurrencies in Zimbabwe. An analysis of bitcoins. *SSRN Electronic Journal*. doi: 10.2139/ssrn.3376307.

McMorrow, J., & Esfahani, M. S. (2021). An exploration into people's perception and intention on using cryptocurrencies. *HOLISTICA – Journal of Business and Public Administration*, *12*(2), 109–144. doi: 10.2478/hjbpa-2021-0018.

Mendoza-Tello, J. C., Mora, H., Pujol-López, F. A., & Lytras, M. D. (2019). Disruptive innovation of cryptocurrencies in consumer acceptance and trust. *Information Systems and E-Business Management*, *17*(2-4), 195–222. doi: 10.1007/s10257-019-00415-w.

Mikhaylov, A., Danish, M. S. S., & Senjyu, T. (2021). A new stage in the evolution of cryptocurrency markets: Analysis by hurst method. In H. Dinçer, & S. Yüksel (Eds.), *Strategic Outlook in Business and Finance Innovation: Multidimensional Policies for Emerging Economies* (pp. 35–45). Emerald Publishing. doi: 10.1108/978-1-80043-444-820211004.

Muchlis Gazali, H., Hafiz Bin Che Ismail, C. M., & Amboala, T. (2018). Exploring the intention to invest in cryptocurrency: The case of bitcoin. In *2018 International Conference on Information and Communication Technology for the Muslim World (ICT4M)* (pp. 64–68). doi: 10.1109/ICT4M.2018.00021.

Rao, S., Lee, K. B., Connelly, B., & Iyengar, D. (2018). Return time leniency in online retail: A signaling theory perspective on buying outcomes. *Decision Sciences*, *49*(2), 275–305. doi: 10.1111/deci.12275.

Rejikumar, G., Asokan-Ajitha, A., Dinesh, S., & Jose, A. (2022). The role of cognitive complexity and risk aversion in online herd behavior. *Electronic Commerce Research*, *22*(2), 585–621. doi: 10.1007/s10660-020-09451-y.

Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, *87*(3), 355. doi: 10.2307/1882010.

Start.io (2022). Crypto investors in Lebanon. Available from: https://www.start.io/audience/crypto-investors-in-lebanon.

TripleA.io (2022). Cryptocurrency across the world. Available from: https://triple-a.io/crypto-ownership-data/.

Voskobojnikov, V., Abramova, S., Beznosov, K., & Böhme, R. (2021). NON-ADOPTION of crypto-assets: Exploring the role of trust, self-efficacy, and risk. In *Twenty-Ninth European Conference on Information Systems (ECIS 2021)*.

World Economic Forum. (2021). Navigating cryptocurrency regulation: An industry perspective on the insights and tools needed to shape balanced crypto regulation. Geneva, Switzerland. available at: https://www3.weforum.org/docs/WEF_Navigating_Cryptocurrency_Regulation_2021.pdf

Xiong, J., & Tang, Y. (2020). Mobile cryptocurrency for development in asia-moderating effects of advantage, complexity, and compatibility. In *AMCIS 2020 Proceedings* (Vol. 9, pp. 1–6).

Corresponding author
Ali Abdel Karim Abou Ali can be contacted at: ali.abdelkarym@gmail.com