Article

Cryptocurrency as an Investment: The Malaysian Context

Shangeetha Sukumaran [1] **, Thai Siew Bee** [1,*] **and Shaista Wasiuzzaman** [2]

[1] Faculty of Management, Multimedia University, Persiaran Multimedia, Cyberjaya 63100, Malaysia; 1151103718@student.mmu.edu.my

[2] School of Business, University Teknology Brunei, Bandar Seri Begawan BE1410, Brunei; dr.shaista@utb.edu.bn

* Correspondence: sbthai@mmu.edu.my

Abstract: Cryptocurrency is gaining popularity worldwide, with some countries already starting to regulate and accept cryptocurrency in their financial services. Malaysia's Securities Commission (SC) announced in October 2021 that over MYR 16 billion (USD 3.85 billion) involving digital assets and cryptocurrencies were traded between August 2020 and September 2021. Since cryptocurrencies are issued by private corporations and are technically beyond the federal government's control, criminals may use them for illegal reasons such as money laundering and terrorist funding. Consequently, it is vital to examine why investors are engaged in cryptocurrency in the first place. This study aims to provide insight into Malaysian investors' perceptions by evaluating the influence of perceived risk and perceived value on their cryptocurrency adoption decision. The retail investors' demographic characteristics (gender, age, education, income, and investment experience) were analyzed as control variables. Data were gathered using purposive sampling, and responses from 211 respondents from various cities in Malaysia were used in the final analysis. Data were examined using Smart PLS Structural Equation Modelling (PLS-SEM). Based on the finding's, perceived value was found to have a significant influence on cryptocurrency adoption. Meanwhile, perceived risk had no significant influence on the adoption of cryptocurrency among the Malaysian investors.

Keywords: risk; cryptocurrency; investment; Malaysia; investors

1. Introduction

Globalization and the development of financial markets have increased people's ability to invest in securities and financial instruments as they are no longer bound by national borders (Lim 2013). Cryptocurrency and the technology that underpins them, namely blockchain technology, are developing into popular investment instruments and are transforming the way financial services operate and accelerating the pace of digitalization. Additionally, when the world was struck with a global health catastrophe in the form of the COVID-19 pandemic that resulted in the implementation of quarantines and restrictions worldwide, the future of financial services could not have evolved sooner.

Nevertheless, the world economy has suffered as a result of the pandemic, causing a devastating downturn that affected most financial markets. Accordingly, investors began looking for an alternative and recognized the potential of the digital economy in the wake of restrictions and movement control. Given the fact that almost all the world's population was restricted to their homes as a result of lockdowns, consumers became more engaged in online businesses. Although digital currencies were not used as a medium of payment, many investors switched their investments to cryptocurrencies in the hope of profiting, despite the fact that they were not backed by economic fundamentals. However, Malaysian regulators and policymakers seem to be unsure of how to approach this new innovation and how to properly utilize this new technology (Nawang and Azmi 2021).

Alternatively known as digital or virtual currencies or tokens, cryptocurrencies are developed or mined and privately traded for transactions by individuals or organizations. However, regulators in many countries do not recognize cryptocurrency. Despite the total

ban on the usage of cryptocurrency in many countries, cryptocurrency is gaining popularity in the recent years as a number of countries have started accepting and regulating cryptocurrency (Global Legal Research Center 2018). Additionally, the interest in cryptocurrency is gaining momentum as many blockchain start-up companies are using cutting-edge blockchain innovation in developing economies to enhance the efficiency of the current banking system.

In the context of Malaysia, the government made its position on cryptocurrency clear in 2019 by adopting the cryptocurrency law which took effect on 15 January 2019. The Capital Markets and Services Order 2019 categorizes all digital coins, tokens, and crypto assets as being protected and subjected to the Securities Commission Regulations. Anyone involved in unlicensed initial coin offerings or digital asset exchanges in Malaysia could face a ten-year prison sentence and a RM10 million fine (Zmudzinski 2019). Additionally, Malaysia's Ministry of Finance reaffirmed the government's objective of encouraging continuing growth in digital asset creation and peer-to-peer lending while protecting investors in digital asset trading in certain circumstances. In achieving this goal, the Securities Commission Malaysia (SC) and Bank Negara Malaysia (BNM) began working closely together in December 2020 to establish cryptocurrency and digital asset policies and regulations that would foster sustainable innovation while managing any potential risks connected with this developing sector.

In Malaysia, the adoption of cryptocurrency in general, including its adoption by investors, is still in its early adopter phase (Ku-Mahamud et al. 2018; Yeong et al. 2019; Yusof et al. 2018). In an effort to foster innovation and creativity, Bank Negara Malaysia (BNM) does not prohibit Bitcoin trading even though digital currencies are not legal cash in Malaysia. Thus, the question of whether the digital currency should be regulated in Malaysia needs to be addressed. Malaysian regulators and policymakers are presently working on how to approach this new innovation and how best to utilize this new technology. Accordingly, having better knowledge about Malaysian retail investors' perceptions of the risks and returns would help policymakers and regulators to make better decisions on how to deal with cryptocurrency investments. This is essential since governments need to engage carefully in this area by avoiding both over-and under-regulation since both would hinder the development of digitalization. Therefore, knowing retail investors' perception of risk and value in relation to cryptocurrency investment is crucial as such knowledge would be able to provide an insight into public perception of this new emerging form of investment.

This study, therefore, aimed to gain insight on cryptocurrency investment based on the perceptions of Malaysian retail investors. Consumer behavior theory was adopted in this study to understand investors' perceptions by studying factors of perceived risk and perceived value. Additionally, demographic factors (gender, age, education, income, and investment experience) were included as control variables. Specifically, this study aimed to gain insight on investors' perceptions of cryptocurrency investments and their intention to adopt cryptocurrency as an investment vehicle. The findings of the study showed that perceived value, gender, and age had an influence on adoption. In contrast, perceived risk, education, income, and investment experience were found not to have any influence on adoption.

This paper is organized as follows. It begins with an introduction section, which is followed by the literature review and the methodology sections. The research findings and discussion of the results are provided in the subsequent section. The concluding section then presents the study's limitations and highlights possible future studies.

2. Literature Review

The decentralized and anonymous (or pseudonymous) features of cryptocurrency have made it easy for criminals to use it to engage in a variety of illegal activities including money laundering and terrorism financing. Additionally, the anonymity exhibited by cryptocurrencies can lead to consumers being manipulated into believing they are engaging

with legitimate firms, only to discover they have been victimized. Given their anonymity, terrorist funders have even used this platform to finance terrorists as their transactions cannot be traced back to them. The uncovering of Silk Road, a black-market network that accepts Bitcoin for the trade of illegal drugs (Daniels 2014), is one such example of how cryptocurrencies could be easily used for illicit transactions. Such a scenario has undoubtedly raised legal concern over the monitoring and regulating of cryptocurrency. Despite the fact that cryptocurrency is highly volatile and lacks a regulatory framework, research on the primary reasons for investing in cryptocurrency is still scarce (Gupta et al. 2020). Nevertheless, research on the phenomenon is currently gaining momentum.

Zulhuda and Sayuti (2017) found that government attitudes and perceptions toward cryptocurrency vary across countries. They argued that Malaysia has so far embraced a "minimalist" approach to cryptocurrencies while possibly adopting a "wait and see" approach toward it. As a result, the business and activities of digital currency exchanges are not protected by the market norms that are applicable to other financial organizations that are regulated. For this reason, Zulhuda and Sayuti (2017) maintained that the government should conduct a closer inspection and consider implementing an industrial self-regulatory system to handle and manage key elements and risks. In a study conducted by Huang (2019), in China it was found that many of the respondents were keen and wanted to buy Bitcoin; they also wanted the government to get involved. More than 50% of the respondents in Huang's study reported that they understood the higher return from cryptocurrency investments, especially that of Bitcoin; however, many were unaware of its risks and perceived values.

In general, cryptocurrency is viewed as a speculative investment instead of a long-term investment (AFM 2018). According to Ryu and Ko (2019), cryptocurrency as a speculative investment activity is a natural response to an unbalanced interplay between high and low impulses. The findings of his study, which was conducted in South Korea, imply that Bitcoin speculation uses a decision-making process similar to that used by other unplanned or risky IT behaviors. Inci and Lagasse (2019) demonstrated that cryptocurrencies' contributions to an ideal portfolio are dynamic and thus evolve over time. Based on their findings, the authors concluded that popular cryptocurrencies play an important role in portfolio construction and investment, in addition to the original purpose of growing money. Their findings also indicate that social commerce promotes trust in cryptocurrency usage and willingness to use cryptocurrency.

Despite the lack of authoritative statistics and official records on the adoption and use of cryptocurrencies in Malaysia, it is claimed that Bitcoin has been transacted in the nation since 2012, with many relying on posts on BitcoinMalaysia.com (Nawang and Azmi 2021). Nevertheless, a detailed examination of the historical evolution of cryptocurrencies from 2012 to the present reveals that the currency's promising future has yet to be properly acknowledged by the Malaysian public. It has been argued that the concern over loss or theft, fraud or unauthorized use, wallet or exchange failure, inadequate disclosure as well as issues of transaction processing are some of the potential risks that may have contributed to Malaysian consumers' slow adoption of cryptocurrencies (Zahudi and Amir 2016). This is supported by Nawang and Azmi (2021) who reasoned numerous factors may have contributed to the delayed adoption of these cryptocurrencies in this country. However, they maintained that most of these are centered on concerns about security and consumer protection. The Malaysian government has taken a "minimalist" approach to cryptocurrency regulation to avoid stifling innovation and the growth of cryptocurrency in the country (Nawang and Azmi 2021). In doing so, it could be argued that the government has taken a warm approach toward cryptocurrency regulation in Malaysia (Durgha 2018).

In this study, perceived risk and perceived value were identified as two important factors influencing the adoption of cryptocurrency in Malaysia. Perceived value was chosen to evaluate if Malaysian investors have a positive perception of the returns and gains from cryptocurrency investment while perceived risk was used to evaluate the negative perception of investors toward cryptocurrency investment.

2.1. Hypotheses Development

This study extended upon the research on consumer behavior in the formulation of its hypotheses. The purpose of this study was to examine retail investors' perceptions of risk and value in relation to cryptocurrency investment. This research adopted consumer behavior theory as the theoretical framework, with an emphasis on marketing and the underlying perceptions that influence consumers' purchasing decisions.

Although there have been a lot of changes in traditional and behavioral finance, only a small number of studies have examined the range of key factors in the field of consumer behavior. This is surprising given the close relationship between behavioral finance and consumer behavior since both have examined individual decision-making using aspects of psychology and sociology. As a result, it was deemed relevant and beneficial to investigate the influence that consumer behavior factors may have on retail investors' actions toward investing in cryptocurrencies. For this reason, this study used consumer behavior theory to understand retail investors' intention to adopt cryptocurrency as an investment.

Consumer behavior is the examination of individuals, groups, and organizations as well as the processes by which they select, secure, use, and dispose of products and services (Gabbott 2008). Consumer behavior started its growth phase in the 1960s when numerous concepts were integrated into comprehensive measures and models of buyer behavior. Nicosia and Francesco's (1966) Consumer Decision Process Model, Engel et al.'s (1968) Consumer Behavior Model, Howard and Sheth's (1969) Theory of Buyer Behavior, Fishbein and Ajzen's (1975) Theory of Reasoned Action, and Ajzen's (1985) Theory of Planned Behavior are just a few examples of well-known models.

An extensive list of potential obstacles confronts consumers when they are attempting to decide on what to buy, including discovering the need for and the availability of new products or services, learning about alternate selections, anticipating possible future events connected to the purchase, and contemplating possible purchase outcomes (Peter and Olson 1993). Given that an investor's decision-making process is similar to that of a consumer, it may be beneficial to explore the impact of consumer behavior structures on investors' intentions to invest in the cryptocurrency market. This is especially essential for retail investors who are more likely to fall victim to biases and make less "rational" decisions because of the lack of knowledge and information available to them. Consequently, as retail investors usually have a limited understanding of financial markets, they tend to seek more information than professional institutional investors (Black 1992). As a result, the area of consumer behavior may provide new insights into the elements that impact retail investors' decisions about which investment products to use to meet their goals. The constructions that focus on risk, uncertainty, and opportunity for development are expected to have a major influence on retail investors' decisions.

2.2. Independent Variables

2.2.1. Perceived Risk

To quantify risk, one must consider both its defining characteristics and the probability of unfavorable outcomes and consequences. According to Gratt (1987, p. 98), estimation of risk is usually based on "the expected value of the conditional probability of the event occurring times the expected consequence of the event given that has occurred". Consumer decision-making models have included perceived risk as an explanatory variable (Srinivasan and Ratchford 1991). Consumer decision-making is strongly influenced by perceived risk (Peter and Tarpey 1975; Conchar et al. 2004). Taylor (1974) proposed that if the level of perceived risk is determined, it is easy to determine how people behave in connection to that risk. Thus, it becomes possible to comprehend investors' intentions and motivations when their perception of risk is understood.

Perceptions of risk have been studied in a variety of contexts, including product and service assessments, as well as the adoption of new technologies and services. Studies have shown that risk perceptions, which are beliefs or assessments of the associated risks associated with a particular behavior, can have an effect on how people act and think. Risk

perceptions associated with making a poor or inappropriate decision lower a consumer's possibility of buying an alternative (Jarvenpaa and Todd 1996–1997; Bhatnagar et al. 2000; Vijayasarathy and Jones 2000). Consumers may encounter a higher risk when purchasing investment products than when purchasing other products as the financial value is frequently higher and there are no guarantees or options for returning a purchase and receiving a full refund. Weber and Milliman (1997) discovered in their study that participants who perceived less risk in behavior were likely to have a more positive attitude toward the behavior. Additionally, Arias-Oliva et al. (2019) found that risk was not a significant factor in influencing cryptocurrency use in Spain and argued that this could be due to the fact that most of the respondents considered the risk associated with cryptocurrency to be low.

Faqih (2016) defined perceived risk in behavioral research as consumers' perception of the degree of uncertainty and possible negative effects of using or purchasing a product. Kannungo and Jain (2004) remarked that perceived risk is a factor in people's purchase intentions and how likely they are to use a new technology. Recent studies have looked at how perceived risk affects people's desire to use financial technologies, and the results have been contradictory. Mendoza-Tello et al. (2018), for instance, indicated that perceived risk has no effect on the decision to adopt cryptocurrency for electronic payments. In this present study, perceived risk is included to understand retail investors' perception of risk when adopting cryptocurrency investment. Based on the understanding of cryptocurrency as a new financial technology with possible risks, the following hypothesis was therefore suggested.

Hypotheses 1 (H1). *Perceived risk has a negative influence on cryptocurrency adoption among investors in Malaysia.*

2.2.2. Perceived Value

Perceived value is known as a measure of the potential gain or loss from using a particular product or service (Zeithaml 1988). Perceived value is a highly complex factor that is examined in two areas, namely perceived usefulness and enjoyment of an individual (Hsu and Lin 2015; Shao et al. 2014). In technology adoption, usefulness is listed as a motivator for people to want to use a certain technology. Many studies refer to the evaluation of the intention to implement a new technology as the advantages an individual is able to gain from the given technology and how valuable it is to the individual (Shao et al. 2014; Pham and Ho 2015). As a result, people's intentions to use blockchain technology are expected to be impacted by their perceptions of its use and enjoyment (Yang et al. 2016). Several researchers have found that usefulness and enjoyment influence behavioral intention (Alalwan et al. 2018; Baabdullah 2018). The impact of perceived value as an independent variable and behavioral intention as a dependent variable has also been presented in the literature (Zeithaml 1988; Pei et al. 2015; Abramova and Böhme 2016). Individuals' expectations for blockchain to offer higher perceived value could theoretically increase their behavioral intention to use it if perceived value is considered a multidimensional factor. Although cryptocurrencies have no intrinsic worth, the mindset of investors concerning high returns is much more crucial in recognizing higher moments of return predictability (Cheah and Fry 2015).

Trading and speculating on exchange markets are achieved by fluctuations in exchange rates between cryptocurrencies and fiat currencies. Many consumers tend to purchase cryptocurrencies not to use them to pay for goods or services, but rather to take advantage of the high price volatility and to hold on to it until the exchange rates increase (Böhme et al. 2015). This fact applies to the ongoing debate in academia and practice about whether cryptocurrencies should be considered a digital currency or simply an investment tool (Glaser et al. 2014; Hur et al. 2015). Although investment opportunities affect people's decisions to use cryptocurrencies, Hur et al. (2015) found that the speculative nature of the currency is not the only reason for adoption. Mendoza-Tello et al. (2018) found that perceived usefulness is the most important factor in people's intentions to use cryptocurrencies

for electronic payments. They also found that individuals who believe cryptocurrencies are easy to use are more inclined to use them. By the same token, Shahzad et al. (2018) also discovered that perceived usefulness and perceived ease of use have a significant influence on the intention to adopt Bitcoin in China.

According to Polasik et al. (2015), cryptocurrencies' success particularly that of Bitcoin, as well as media coverage of cryptocurrencies and the total number of transactions all have an impact on their returns and profitability. Investors are drawn to cryptocurrencies as an investment option because of their perceived attractive characteristics, exceptionally high market volatility, high average return, accessibility even on weekends, and low correlation with traditional assets, which are all characteristics that have major diversification advantages (Briere et al. 2015). Rufino (2019) in his study on the risk-return profile of Bitcoins concluded that the long-run daily return on Bitcoin is highly significantly positive and the returns are generally symmetric. The high return rate can be used to evaluate the perceived value of cryptocurrency, which includes the perceived speculative value aspect. Therefore, the following hypothesis was formed for this study.

Hypotheses 2 (H2). *Perceived value has a positive influence on cryptocurrency adoption among investors in Malaysia.*

2.2.3. Control Variable

Control variables are able to explain individual differences in cryptocurrency adoption intentions (Lee et al. 2019). Previous research has reported that an individual's gender, age, income level, previous education, and investment experience all influence their investment decision (Xi et al. 2020; Jia et al. 2021; Liao et al. 2017). In this study, the control variable was included to examine the possible differences in the respondents' gender, age, income, education, and investment knowledge that might influence their intention to invest in cryptocurrency.

3. Methodology

3.1. Data Collection

This study was a quantitative study that focused on Malaysian retail investors' perceptions of cryptocurrency investment. Identification and access to the respondents were made through a cryptocurrency-focused social media group. Purposive sampling and respondent-driven sampling were adopted where respondents with prior investment knowledge of cryptocurrency were considered in the sampling frame. The main criterion for sampling was that the respondents must have knowledge of cryptocurrencies although they may not have invested in these currencies before. In order to identify respondents who fulfilled the sampling criteria described above, two questions on the respondents' knowledge in and experience with cryptocurrencies were posed. Each question was constructed with a five-point Likert response option. The first question asked the respondents the length of time that they have been involved in cryptocurrency investment with the response options ranging from 1 (I have never invested in cryptocurrency investment) to 5 (More than 3 years). The second question asked the respondents the depth of their knowledge of cryptocurrency where the response options ranged from 1 (None) to 5 (A great deal).

This study also used an ordinal scale to measure the dependent and independent variables. The dependent variable in this study was "adoption" while the independent variable was "perception" which included perceived risk and perceived value which were adopted from the consumer behavior theory. For the control variables, five demographic factors were analyzed, namely age, gender, income, education, and investment experience.

In the questionnaire, a five-point Likert scale was employed to identify the respondents' level of agreement or disagreement with the statements that measured each construct. The value for the scale ranged from 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree". The questionnaire was divided into five sections. Section 1 introduced the purpose and the objective of the research to provide some background

information about the research to the respondents. Section 2 contained the consent form which sought to obtain informed consent from the respondents for their participation in the research. Section 3 contained questions related to the respondents' demographic information which covered age, gender, income, education level, and investment experience. Section 4 focused on the respondent's investment knowledge and experience. Section 5 contained questions on the two main factors of perceived risk and perceived value.

Data were collected over a period of two months, from September 2021 to November 2021. Due to the anonymity nature of cryptocurrency, the respondents were approached using various social media platforms by identifying the retail investors' cryptocurrency-focused social media group. Data were collected through an online survey questionnaire which was created using a Google form. The Google form link to the questionnaire was then posted on the targeted social media platforms. G*Power was used to calculate the sample size requirement and the calculation produced a minimum of 184 respondents. At the end of the sampling period, a total of 280 questionnaires were returned. However, after conducting the filtering process, it was found that only 211 questionnaires were completely answered.

3.2. Measurement of Variables

In this study, the quantitative approach was used where an online survey questionnaire was employed as the data collection instrument. The variables in this study were measured using an ordinal scale. The dependent variable "adoption" and independent variables of "perceived risk" and "perceived values" were measured based on self-report. Table 1 presents the items for the constructs and their sources.

Table 1. Items for construct and their sources.

Item	Questions	Source
ADOP1	How likely are you to invest in cryptocurrency this year?	
ADOP2	I have plans to invest in cryptocurrencies in the future	
ADOP3	There is a high probability I will invest in cryptocurrency next time	
ADOP4	I will encourage others to invest in cryptocurrencies	
PR1	Investing in cryptocurrencies is risky	
PR2	There is too much uncertainty associated with investing in cryptocurrencies	
PR3	Compared with other currencies/investments, cryptocurrencies are riskier	Mahomed (2017), Faqih (2016), Shim et al. (2001), Gupta et al. (2020)
PV1	Using cryptocurrency in trading helps me improve the effectiveness, profitability, and investment of my money	
PV2	I find that trading in cryptocurrencies can save money as it allows me to invest it quickly and inexpensively with lower transaction costs	
PV3	Using cryptocurrency helps me improve my financial performance because I have total control over my money	
PV4	I feel satisfied with my cryptocurrency investment decisions	
PV5	Investing in cryptocurrencies will increase opportunities to achieve important goals for me	

Additionally, five demographic factors (gender, age, education level, income, and investment experience) representing the control variables were added to the framework. A five-point Likert scale was used as the response option with (1) Strongly disagree, (2) Disagree, (3) Neutral, (4) Agree, and (5) Strongly agree. The results of the analysis on the investors' investment profile are discussed in the following section.

4. Results of Analysis on Investor's Investment Profile

In this section, the results of the analysis conducted on the data collected are presented. Table 2 presents the results of the frequency analysis performed on the demographic data of the respondents.

Table 2. Investors' demographic profile.

Characteristics	Respondent's Profile (Retail Investors)	Total No. of Respondents: 211	
		Frequency	(%)
Gender	Male	157	74.4%
	Female	54	25.6%
Age	18–24	44	20.9%
	25–34	66	31.3%
	35–44	38	18.0%
	45–54	33	15.6%
	55+	30	14.2%
Education Level	Bachelor's degree	91	43.1%
	Diploma	45	21.3%
	Master's degree	37	17.5%
	High school	15	7.1%
	Doctoral degree	10	4.7%
	Professional degree	10	4.7%
	No formal education	3	1.4%
Income	Below RM2000	43	20.4%
	RM2001–RM4000	47	22.3%
	RM4001–RM6000	43	20.4%
	RM6001–RM8000	21	10.0%
	RM8001–RM10,000	22	10.4%
	Above RM10,000	35	16.6%
Employment	Private sector	100	47.4%
	Self employed	42	19.9%
	Student	26	12.3%
	Government servant	20	9.5%
	Retired	13	6.2%
	Others	10	4.7%
Investment Experience	More than 3 years	80	37.9%
	1–3 years	73	34.6%
	Less than 1 year	58	27.5%

Responses from a total of 211 respondents were analyzed for their demographic factors. Most of the respondents or 157 respondents (74.4%) were male while the rest, i.e., 54 respondents (25.6%), were female. Most of the respondents were from the age group of 25 to 34, with 66 respondents (31.3%) coming from this age group. This was followed by respondents in the age group of 18 to 24, with 44 respondents (20.9%). Only 30 respondents (14.2%) were from the age group of 55 and above. In terms of education level, the majority of the respondents, i.e., 91 respondents (43.1%), were bachelor's degree holders. This is followed by diploma holders with 45 (21.3%) respondents. Only 3 respondents (1.4%) reported having no formal education.

Concerning income, most of the respondents were from the income group of RM2001 to RM4000, with 47 respondents (22.3%) belonging in this group. The same number of respondents, i.e., 43 respondents (20.4%), reported earning income below RM2000, and between RM4001 and RM6000, respectively. Meanwhile, 21 respondents (10%) reported earning an income of between RM6001 andRM8000, while 35 respondents (16.6%) were in the highest income group of above RM10,000. The majority of the respondents, i.e., 100 respondents (47.4%), were employed in the private sector, while 42 respondents (19.9%) were self-employed. In relation to investment experience, 80 respondents (37.9%) reported having investment experience of more than 3 years, followed by 73 respondents (34.6%) having 1–3 years of investment experience and 58 respondents (27.5%) having less than 1

year of experience. The next segment presents the analysis of the respondents' investment profile. The results of the frequency analysis on the respondents' investment profile in terms of their knowledge and experience are presented in Table 3, arranged in order of the highest frequency of responses for each item.

Table 3. Investors' investment profile.

Investor's Investment Portfolio	No. of Respondents	%
Years of Investment Experience		
I have never invested in cryptocurrencies	66	31.28%
Less than a year	65	30.80%
From 1 to 2 years	33	15.64%
More than 3 years	28	13.27%
From 2 to 3 years	19	9.00%
Portfolio Allocation		
0–20%	108	51.18%
21–40%	59	27.96%
41–60%	26	12.32%
81–100%	9	4.27%
61–80%	9	4.27%
Depth in Knowledge of Cryptocurrency		
A moderate amount	95	45.02%
A little	60	28.44%
None at all	29	13.74%
A lot	18	8.53%
A great deal	9	4.27%
Cryptocurrency Investment		
I have never invested in cryptocurrency	66	31.28%
Invested in various cryptocurrency	145	68.72%
Bitcoin	97	45.97%
Ethereum	75	35.55%
Litecoin	36	17.06%
Tether	36	17.06%
XRP	79	37.44%
Uniswap	11	5.21%
Others	50	23.70%
Binance	49	23.22%
Polkadot	22	10.43%
Dogecoin	43	20.38%

The majority of the respondents or a total of 140 respondents (68.72%) reported having prior experience of investing in cryptocurrencies. Sixty-six respondents (31.28%) stated they had no experience in cryptocurrency investment. In terms of portfolio allocation, the majority of the respondents, i.e., 108 respondents (51.18%), reported allocating between 0 and 20% for their investment portfolio. This is followed by 59 respondents (27.96%) who allocated between 21 and 40%, 26 respondents (12.32%) allocating between 41 and 60%, 9 respondents (4.27%) allocating between 81 and 100%, and 9 respondents (4.27%) allocating between 61 and 80% for their investment portfolio. When asked regarding their knowledge of cryptocurrency, 95 respondents (45.02%) claimed to have a moderate amount of knowledge in cryptocurrency. In contrast, only a small number of respondents, i.e., 9 respondents (4.27%), claimed to have a great deal of knowledge in cryptocurrency.

4.1. Structural Equation Modelling

The relationship between the two independent variables (perceived risk and perceived value) and the dependent variable (adoption) was analyzed using SmartPLS 3 via SEM-PLS. All the items manifested a reflective measurement model. The control variables (gender, age, education, income, and investment) were measured using single-item constructs. Figure 1 represents the measurement model of the data collected.
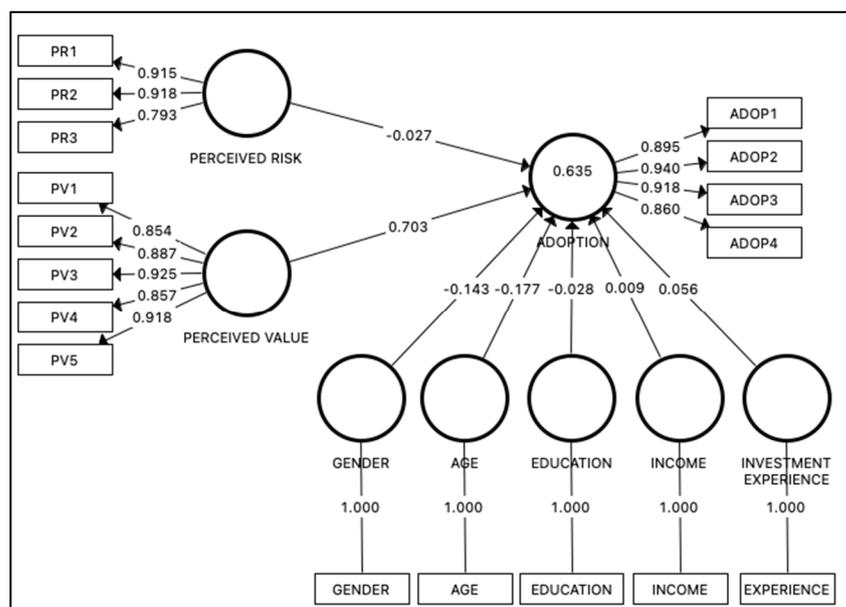
Figure 1. Measurement model assessment.

The endogenous latent variable in this model was adoption while the exogenous latent variables were perceived risk and perceived value. The control variables were gender, age, education, income, and investment experience. The latent variable for perceived risk contained three items (PR1, PR2, and PR3) while perceived value consisted of five items (PV1, PV2, PV3, PV4, and PV5).

4.2. Validity and Reliability Test

Firstly, the reflective measurement models were assessed using the measurement model evaluation. Table 4 presents the results of the indicator reliability, internal consistency, convergent validity, discriminant validity, and VIF of the reflectively measured models.

Table 4. Results of the validity and reliability test.

Construct	Items	Outer Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)	Discriminant Validity	VIF
Adoption	ADOP1	0.895	0.947	0.817	Established	N/A
	ADOP2	0.94				
	ADOP3	0.918				
	ADOP4	0.86				
Perceived Risk	PR1	0.915	0.909	0.769	Established	1.04
	PR2	0.918				
	PR3	0.793				
Perceived Value	PV1	0.854	0.949	0.79	Established	1.21
	PV2	0.887				
	PV3	0.925				
	PV4	0.857				
	PV5	0.918				
Gender	GENDER	1	1	1	Established	1.20
Age	AGE	1	1	1	Established	1.57
Education	EDUCATION	1	1	1	Established	1.30
Income	INCOME	1	1	1	Established	1.50
Investment Experince	EXPERIENCE	1	1	1	Established	1.32

The indicators' reliability, internal consistency, convergent validity, discriminant va-lidity, and VIF of the reflectively measured models were all examined. The indicators' reliability was determined using the value of outer loadings. The values obtained were all greater than 0.708, suggesting the latent variables can explain at least 50% of each indicator's variance. Next, internal consistency was measured using composite reliability (CR). Higher composite reliability values imply higher levels of reliability. In this model, all of the items had values greater than 0.7, indicating that the measurement items had a common variance of at least 50%. In terms of convergent validity, all the values for average variance extracted (AVE) were greater than 0.5, indicating that at least 50% of the variation of its items are explained by the constructs.

Discriminant validity was analyzed using Fornell and Larcker (1981) criterion where the correlation of the constructs with all of the other constructs were found not larger than their square root of AVE. The cross loadings or the indicator loadings on the constructs were found to be higher than all the cross loadings with other constructs. Therefore, discriminant validity was established. Based on the discriminant validity assessment through HTMT, all the values were found to be below 0.85; additionally, the confidence interval value was low (2.5%) based on the confidence interval up (97.5%) columns, and all the HTMT inferences were found to be significantly different from 1. Thus, discriminant validity was established between these reflective constructs. Lastly, all of the VIF values were below 2, and thus it was concluded that no collinearity issues were found in this model. Therefore, the analysis continued with the structural model assessment. Figure 2 displays the results of the overall structural model assessment.
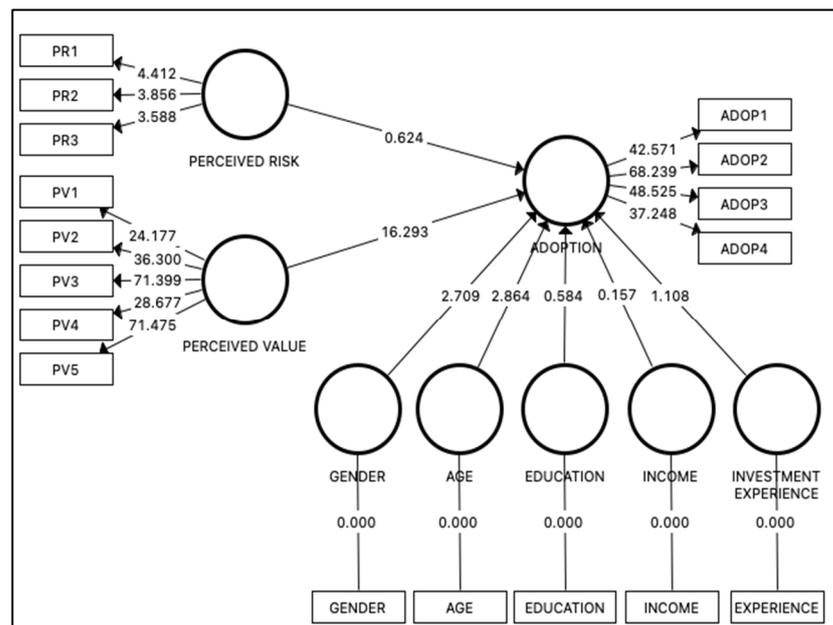

Figure 2. Structural model assessment results.

Structural model analysis was performed after conducting the validity, reliability, and collinearity tests (VIF). A structural model coefficient for the relationships between the constructs was then determined. Table 5 displays the *t*-value and *p*-value for the hypotheses established in this study.

Table 5. Results of path coefficient.

Hypotheses	Relationships	*t*-Value	*p*-Value	Decision
H1	PERCEIVED RISK -> ADOPTION	0.624	0.532	Not supported
H2	PERCEIVED VALUE -> ADOPTION	16.293	0	Supported
Control Variables				
GENDER		2.709	0.007	Significant
AGE		2.864	0.004	Significant
EDUCATION		0.584	0.559	Not Significant
INCOME		0.157	0.876	Not Significant
INVESTMENT EXPERIENCE		1.108	0.268	Not Significant

The *p*-value obtained was below 0.5 and the *t*-value was above 1.96, indicating a significant relationship between the variables tested. Based on the analysis, it was found that perceived value had a significant influence on adoption while perceived risk, on the other hand, was found to have no influence on adoption. The assessment of the demographic factors (gender, age, education, income, and investment experience) which were the control variables in this study is also presented in Table 5. Based on the results of the analysis, gender and age were found to have a significant difference on cryptocurrency adoption among the retail investors while education, income, and investment were found not to have a significant difference. Table 6 presents the F^2, R^2, Q^2, and SRMR results of the structural model assessment.

Table 6. F^2, R^2, Q^2, and SRMR results of the structural model assessment.

RELATIONSHIP	F^2	R^2	Q^2	SRMR
PERCEIVED RISK -> ADOPTION	0.002			
PERCEIVED VALUE -> ADOPTION	1.116			
GENDER -> ADOPTION	0.047			
AGE -> ADOPTION	0.055	0.635	0.488	0.044
EDUCATION -> ADOPTION	0.002			
INCOME -> ADOPTION	0			
INVESTMENT EXPERIENCE -> ADOPTION	0.006			

F^2 was performed to examine the effect and the size of the path coefficient. Perceived value (1.116) was found to have a large effect size. In contrast, perceived risk (0.002), gender (0.047), age (0.055), education (0.002), and investment experience (0.006) all had a small effect size. Meanwhile, income (0) was found to have no effect size on the path coefficient. The R^2 value in this model was 0.635, indicating that the independent variables can explain the dependent variable by 63.5%, which is interpreted to be between the moderate and the substantial value. The Q^2 value was 0.488 which is a large value, indicating higher predictive precision. Additionally, the SRMR value obtained was 0.044.

The findings showed that perceived value had a significant influence on adoption, while perceived risk had no influence on adoption. The results suggest that investors recognize the value of cryptocurrency investments and not the risk. Perceived value was found to have a positive influence on cryptocurrency investment. Retail investors are drawn to cryptocurrencies as an investment option because of their attractive characteristics. Briere et al. (2015) highlighted the key features of cryptocurrencies that make them exceptionally attractive among investors including the high market volatility, high average return, accessibility even on weekends, and low correlation with traditional assets which are all characteristics that have major diversification advantages. This is supported by Lee et al. (2018) who mentioned that cryptocurrency has also been highlighted in many studies for their diversification benefits. Despite the many advantages of cryptocurrency investment, there is also an equal amount of risk associated with cryptocurrency investment. The findings of this study regarding financial literacy among Malaysian retail investors which

revealed that 48.82% of the respondents reported their willingness to allocate more than 20% of their portfolio into cryptocurrency should raise concern. This willingness could be due to the investors' expectation that cryptocurrency investments would skyrocket eventually, as well as their fear of missing out (FOMO) if cryptocurrency prices were to skyrocket. Hence, this study contributes to the consumer behavior theory by highlighting Malaysian retail investors' perceived value over risk in cryptocurrency investment.

The conclusion of this study regarding perceived risk is consistent with Mendoza-Tello et al. (2018) and Arias-Oliva et al. (2019) who both concluded that perceived risk had no influence on cryptocurrency investment adoption. Arias-Oliva et al. (2019) justified that this could be because most respondents regarded the danger associated with cryptocurrencies to be relatively low. Additionally, it could be argued that as a result of the extensive notion that retail investors lack financial literacy and investment knowledge, some retail investors may be completely unaware of the risk that they might be exposed to. As claimed by Weber and Milliman (1997), consumers who have low perceived risk of the behavior are likely to have a more positive attitude toward the behavior. This could be a convincing argument as cryptocurrency investors are often driven by the potential of earning a high rate of return despite the associated risk of cryptocurrency investment. Zhao and Zhang (2021) found that individuals who invested in cryptocurrencies had a much lower perceived risk and a higher risk tolerance than those who did not. As 69.9% of the respondents of this study reported having invested in cryptocurrencies, such a behavior aligns with Zhao and Zhang's (2021) findings, evidencing a low level of risk perception and higher level of risk tolerance among the Malaysian retail investors.

The demographics of age and gender were found to have a significant influence among adopters and potential adopters in this study. Most of the respondents who were already investing in cryptocurrency in this study were male, at 74.4%. According to Faqih (2016), women have a higher risk perception when it comes to adopting new technologies, and this concern is likely to deter them from engaging in these activities. Considering that 74.4% of the respondents in this study were men, this might justify the reason for the finding of unsupported hypothesis for perceived risk. Moreover, women are most likely deterred from cryptocurrency investment because of their low income, the market uncertainty and volatility of cryptocurrency, and their lack of investment experience. In terms of age, most of the respondents (31.3%) in this study were of the age between 25 and 34 years old and belonged to Generation Y. In contrast, only a small number of the respondents at 14.2% belonged to the Baby Boomers category, whose age range were 55 years old and above. Fietkiewicz et al. (2016) argued that different generations have varying levels of technology adoption and acceptance. Various assumptions concerning generational acceptance of technology have been asserted in the literature, where it is claimed that the different perspectives of the different generations combined with the digital divide have prevented older generations from accepting and adopting modern technologies. This assumption is relevant since the majority of the retail investors in this study were from Generations Y and Z who are deemed to have a high level of technological awareness.

Conversely, income, education, and investment experience were found to be insignificant in relation to cryptocurrency investment adoption. This suggests that the demographics of income, education, and investment experience would not result in any significant difference among retail investors in Malaysia that would influence their intention to adopt cryptocurrency as an investment. This finding affirms the results of the descriptive statistics presented in Table 2. The variable of income was found to be insignificant, and this could be attributed to the nature of cryptocurrency investment where cryptocurrency can be acquired in fractions depending on the retail investors' buying power. In addition, there is no capital gains tax in Malaysia; thus, any income earned from the trading of cryptocurrencies would not be taxed. Next, education was also found to be insignificant, and this could be attributed to retail investors having a "non-investment" type of education (Grable 2000). This demonstrates that, despite having a high level of education, retail investors are not necessarily well-versed in investment-related matters. According to Nurbarani

and Soepriyanto (2022), findings indicate that more experienced individuals, especially those who hold more high-risk sophisticated investment products, are more likely to invest in cryptocurrencies. However, this was not the case in this study. Arguably, it could be rationalized that as cryptocurrency investment is relatively new in Malaysia, most retail investors are probably adopting cryptocurrency investment out of curiosity rather than out of their sophisticated knowledge of crypto investment.

5. Implications and Conclusions

5.1. Theoretical and Practical Implications

This study has examined perceptions of risk and value along with the demographic factors (gender, age, income, education, and investment experience) as control variables in relation to their influence on cryptocurrency adoption among Malaysian investors. The results of this research indicate that Malaysian retail investors consider the value of cryptocurrency investments and not its risk when it comes to adopting cryptocurrency investment. The findings of this study provide better understanding and offer a new perspective on Malaysian investors' decision-making process with regard to this new emerging cryptocurrency investment. A significant theoretical contribution of this work is the development of investment intention factors for analyzing the investment decision-making process of Malaysian retail investors from a consumer behavior's viewpoint. Many prior studies have examined the variables affecting cryptocurrency investment, but few have considered how an investor would approach this decision-making process from a consumer standpoint. To the authors' knowledge, this is the first study to employ consumer behavior theory to understand retail investors in the context of cryptocurrency investment.

By understanding investors' adoption behaviors, policymakers would be better able to determine the need for cryptocurrency regulations. Policymakers and regulators can develop policies accordingly by avoiding over-regulating or under-regulating. By over-regulating, Malaysia risks being left behind in terms of new technologies and innovation that could improve the current financial sector. At this early adopter stage, over-regulation through tax burdens, strict licensing requirements, and foreign exchange controls may suffocate innovation efforts. However, if Malaysia fails to regulate, investors will become victims of financial fraud, crime, and money laundering, which could lead to significant losses to consumers, businesses, and investors. This could put Malaysia's financial stability at risk. As a result, regulators and policymakers must design policies that protect retail investors while also fostering the digitization of the financial sector.

To achieve Malaysia's objective of enhancing the development of digital infrastructure and services in accordance with the 12th Malaysian Plan, efficient, effective, and transparent policies regarding cryptocurrency need to be established. In this respect, the findings of this study could help policymakers by giving them better understanding and valuable information regarding retail investors' perceptions of cryptocurrency investment. Based on the findings, the majority of the respondents were male and of a relatively young age. It could be suggested that many of the retail investors in this study are unaware of the risks associated with cryptocurrency investment and are more intrigued by this new emerging investment product. For this reason, regulators should develop policies to protect young and inquisitive investors, as they are Malaysia's future. At this stage, financial literacy awareness for the general population is required.

5.2. Limitations and Recommendations

The study involved a small sample size of 211 respondents and only focused on retail investors. Thus, future research may want to consider including institutional investors and other groups of investors. Additionally, this study only examined the general concept of risk and value. Future researchers may want to expand on this by investigating how cryptocurrency investors perceive risk and value in their investments.

5.3. Conclusions

This study adds significantly to the body of knowledge on consumer behavior research by examining perceptions of retail investors by looking into perceived risk and perceived value. This study has examined perceptions of risk and value along with the control variables of demographic factors (gender, age, income, education, and investment experience) in relation to their influence on cryptocurrency adoption among Malaysian investors. Based on the finding's perceived value was found to have an influence on adoption, while perceived risk had no influence on adoption. The findings shed light on the emerging cryptocurrency investment market in Malaysia for policymakers and regulators by providing greater understanding of Malaysian retail investors' perception. It is concluded that there is a need for government regulation since perceived risk was found to have no influence on cryptocurrency investment in this study. This finding raises concern for Malaysian retail investors since most of the respondents who reported having invested in cryptocurrencies were millennials who lacked knowledge in crypto investment and are therefore at risk of being victimized by cybercriminals and scammers.

References

Abramova, Svetlana, and Rainer Böhme. 2016. Perceived benefit and risk as multidimensional determinants of bitcoin use: A quantitative exploratory study. Paper present at the Thirty Seventh International Conference on Information Systems (ICIS), Dublin, Ireland, December 11–14.

AFM. 2018. *Investing in Cryptos in the Netherlands*. Amsterdam: AFM.

Alalwan, Ali Abdallah, Abdullah Mohammed Baabdullah, Nripendra P. Rana, Kuttimani Tamilmani, and Yogesh Kumar Dwivedi. 2018. Examining adoption of mobile internet in Saudi Arabia: Extending TAM with perceived enjoyment, innovativeness and trust. *Technology in Society* 55: 100–10. [CrossRef]

Arias-Oliva, Mario, Jorge Pelegrín-Borondo, and Gustavo Matias-Clavero. 2019. Variables influencing cryptocurrency use: A technology acceptance model in Spain. *Frontiers in Psychology* 10: 1–13. [CrossRef] [PubMed]

Baabdullah, Abdullah Mohammed. 2018. Consumer adoption of mobile social network games (M-SNGs) in Saudi Arabia: The role of social influence, hedonic motivation and trust. *Technology in Society* 53: 91–102. [CrossRef]

Bhatnagar, Amit, Sanjog Misra, and H. Raghav Rao. 2000. Online Risk, Convenience, and Internet Shopping Behavior. *Communications of the ACM* 43: 98–105. [CrossRef]

Black, Bernard S. 1992. Agents Watching Agents: The Promise of Institutional Investor Voice. *UCLA Law Review* 39: 811.

Böhme, Rainer, Nicolas Christin, Benjamin Edelman, and Tyler Moore. 2015. Bitcoin: Economics, technology, and governance. *Journal Economic of Perspectives* 29: 213–38. [CrossRef]

Briere, Marie, Kim Oosterlinck, and Ariane Szafarz. 2015. Virtual Currency, Tangible Return: Portfolio Diversification with Bitcoin. *Journal of Law, Technology and the Internet* 7: 79–94. [CrossRef]

Cheah, Eng-Tuck, and John Fry. 2015. Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. *Economics Letters* 130: 32–36. [CrossRef]

Conchar, Margy P., George M. Zinkhan, Cara Peters, and Sergio Olavarrieta. 2004. An Integrated Framework for the Conceptualization of Consumers' Perceived Risk Processing. *Journal of the Academy of Marketing Science* 32: 373–89. [CrossRef]

Daniels, Ann. 2014. Bitcoin and Illegal Activity: Silk Road Defendants Pled Guilty on September 4, 2014, UIC. *The John Marshall Journal of Information Privacy & Technology Law*. Available online: https://ripl.law.uic.edu/news-stories/bitcoin-and-illegal-activity-silk-road-defendants-pled-guilty-on-september-4-2014/ (accessed on 22 December 2021).

Durgha, Moorthy. 2018. A Study on Rising Effects of Cryptocurrency in the Regulations of Malaysian Legal System. *International Journal of Business, Economics and Law* 15: 35–41.

Faqih, Khaled M. S. 2016. An empirical analysis of factors predicting the behavioral intention to adopt Internet shopping technology among non-shoppers in a developing country context: Does gender matter? *Journal Retailing Consumer Services* 30: 140–64. [CrossRef]

Fietkiewicz, Kaja, Elmar Lins, Katsiaryna. S. Baran, and Wolfgang G. Stock. 2016. Inter-generational comparison of social media use: Investigating the online behavior of different 151 generational cohorts. Paper present at 2016 49th Hawaii International Conference on System Sciences (HICSS), Koloa, HI, USA, January 5–8; pp. 3829–38.

Fornell, Claes, and David F. Larcker. 1981. Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research* 18: 39–50. [CrossRef]

Gabbott, Mark. 2008. Consumer Behaviour. In *The Marketing Book*. Edited by Michael J. Baker and Susan Hart. Oxford: Elsevier, pp. 109–20.

Glaser, Florian, Kai Zimmerman, Martin Haferkorn, Moritz Christian Weber, and Michael Siering. 2014. Bitcoin—Asset or Currency? Revealing Users' Hidden Intentions. Social Science Research Network. Paper present at ECIS 2014 Proceedings-22nd European Conference on Information Systems, Tel Aviv, Israel, June 9–11.

Global Legal Research Center. 2018. Regulation of Cryptocurrency around the World. The Law Library of Congress 5080 June. Available online: https://www.loc.gov/law/help/cryptocurrency/regulation-of-cryptocurrency.pdf (accessed on 22 December 2021).

Grable, John E. 2000. Financial risk tolerance and additional factors that affect risk taking in everyday money matters. *Journal of Business and Psychology* 14: 625–30. [CrossRef]

Gratt, Lawrence B. 1987. Risk Analysis or Risk Assessment: A Proposal for Consistent Definitions. In *Uncertainty in Risk Assessment, Risk Management and Decision Making*. Edited by V. T. Covello, L.B. Lave, A. Moghissi and V. R. R. Uppuluri. Advances in Risk Analysis. Boston: Springer, vol. 4.

Gupta, Swati, Sanjay Gupta, Manjo Mathew, and Hanumantha Rao Sama. 2020. Prioritizing intentions behind investment in cryptocurrency: A fuzzy analytical framework. *Journal of Economic Studies* 48: 1442–59. [CrossRef]

Hsu, Chin-Lung, and Judy Chuan-Chuan Lin. 2015. What drives purchase intention for paid mobile apps?—An expectation confirmation model with perceived value. *Electronic Commerce Research and Applications* 14: 46–57. [CrossRef]

Huang, Weilun. 2019. The impact on people's holding intention of bitcoin by their perceived risk and value. *Economic Research-Ekonomska Istrazivanja* 32: 3570–85. [CrossRef]

Hur, Yunyoung, Seongmin Jeon, and Byungjoon Yoo. 2015. Is Bitcoin a viable e-business? Empirical analysis of the digital currency's speculative nature. Paper present at the ICIS 2015 Proceedings of 36th International Conference on Information Systems, Fort Worth, TX, USA, December 13–16; pp. 1–10.

Inci, A. Can, and Rachel Lagasse. 2019. Cryptocurrencies: Applications and investment opportunities. *Journal of Capital Markets Studies* 3: 98–112. [CrossRef]

Jarvenpaa, Sirrka L., and Peter A. Todd. 1996–1997. Consumer Reactions to Electronic Shopping on the World Wide Web. *International Journal of Electronic Commerce* 1: 59–88.

Jia, Dekui, Ruihai Li, Shibo Bian, and Christopher Gan. 2021. Financial planning ability, risk perception and household portfolio choice. *Emerging Markets Finance and Trade* 57: 2153–75. [CrossRef]

Kannungo, Shivraj, and Vikas Jain. 2004. Relationship between risk and intention to purchase in an online context: Role of gender and product category. Paper present at the 13th European Conference on Information Systems, The European IS Profession in the Global Networking Environment, Turku, Finland, June 14–16.

Ku-Mahamud, Ku Ruhana, Nur Azzah, Abu Bakar, and Mazni Omar. 2018. Blockchain, cryptocurrency and Fintech market growth in Malaysia. *Journal of Advanced Research in Dynamical and Control Systems* 10: 2074–82.

Lee, David Kuo Chuen, Li Guo, and Yu Wang. 2018. Cryptocurrency: A new investment opportunity? *Journal of Alternative Investments* 20: 16–40.

Lee, Won Jun, Seong Tae Hong, and Taeki Min. 2019. Bitcoin distribution in the age of digital transformation: Dual-path approach. *Journal of Distribution Science* 16: 47–56.

Liao, Li, Jing Jian Xiao, Weiqiang Zhang, and Congyi Zhou. 2017. Financial literacy and risky asset holdings: Evidence from China. *Accounting and Finance* 57: 1383–415. [CrossRef]

Lim, Kang Li. 2013. *Investment Intentions: A Consumer Behaviour Framework*. Crawley: UWA Business School.

Mahomed, Nadim. 2017. *Understanding Consumer Adoption of Cryptocurrencies*. Pretoria: University of Pretoria.

Mendoza-Tello, Julio, Higinio Mora, Pujol Franscisco, and Miltiadis Lytras. 2018. Social commerce as a driver to enhance trust and intention to use cryptocurrencies for electronic payments. *IEEE Access* 6: 50737–51. [CrossRef]

Nawang, Nazli Ismail, and Ida Madieha Abd Ghani Azmi. 2021. Cryptocurrency: An Insight into the Malaysian Regulatory Approach. *Psychology and Education Journal* 58: 1645–52.

Nurbarani, Bella Siti, and Gatot Soepriyanto. 2022. Determinants of Investment Decision in Cryptocurrency: Evidence from Indonesian Investors. *Universal Journal of Accounting and Finance* 10: 254–66. [CrossRef]

Pei, Yanli, Shan Wang, Jing Fan, and Min Zhang. 2015. An empirical study on the impact of perceived benefit, risk and trust on e-payment adoption: Comparing quick pay and union pay in China. Paper present at the 2015 7th International Conference on Intelligent Human-Machine Systems and Cybernetics, Hangzhou, China, August 26–27; vol. 2, pp. 198–202.

Peter, J. Paul, and Jerry C. Olson. 1993. *Consumer Behavior and Marketing Strategy*, 3rd ed. Chicago: American Marketing Association.

Peter, J. Paul, and Lawrence X. Tarpey Sr. 1975. A Comparative Analysis of Three Consumer Decision Strategies. *Journal of Consumer Research* 2: 29–37. [CrossRef]

Pham, Thanh-Thao T., and Jonathn C. Ho. 2015. The effects of product-related, personal-related factors and attractiveness of alternatives on consumer adoption of NFC-based mobile payments. *Technology in Society* 43: 159–72. [CrossRef]

Polasik, Michal, Anna Iwona Piotrowska, Tornasz Piotr Wisniewski, Radoslaw Kotkowski, and Geoffrey Lightfoot. 2015. Price fluctuations and the use of bitcoin: An empirical inquiry. *International Journal of Electronic Commerce* 20: 9–49. [CrossRef]

Rufino, Cesar C. 2019. An analysis of the risk-return profile of the daily Bitcoin prices using different variants of the GARCH Model. Paper present at the 2019 DLSU Research Congress Manila, Manila, Philippines, July 19–21.

Ryu, Hyun-Sun, and Kwang Sun Ko. 2019. Understanding speculative investment behavior in the Bitcoin context from a dual-systems perspective. *Journal of Industrial Management & Data Systems* 119: 1431–56.

Shahzad, Fakhar, GuoYi Xiu, Jian Wang, and Muhammad Shahbaz. 2018. An empirical investigation on the adoption of cryptocurrencies among the people of mainland China. *Technology in Society* 55: 33–40. [CrossRef]

Shao, Mingxing, Jing Fan, and Yafang Li. 2014. An empirical study on consumer acceptance of mobile payment based on the perceived risk and trust. Paper present at the 2014 International Conference on Cyber-Enabled Distributed Computing and Knowledge Discovery, Shanghai, China, October 13–15.

Shim, Soyeon, Mary Ann Eastlick, Sherry L. Lotz, and Patricia Warrington. 2001. An online prepurchase intention model: The role of intention to search: Best Overall Paper Award. *Journal Retailing* 77: 397–416. [CrossRef]

Srinivasan, Narasimhan, and Brian T. Ratchford. 1991. An Empirical Test of a Model of Extended Search for Automobiles. *Journal of Consumer Research* 18: 233–42. [CrossRef]

Taylor, James W. 1974. The Role of Risk in Consumer Behaviour. A comprehensive and operational theory of risk taking in consumer behavior. *Journal of Marketing* 38: 54–60.

Vijayasarathy, Leo R., and Joseph M. Jones. 2000. Print and Internet Catalog Shopping. *Internet Research: Electronic Networking Applications and Policy* 10: 191–202. [CrossRef]

Weber, Elke U., and Richard A. Milliman. 1997. Perceived Risk Attitudes: Relating Risk Perception to Risky Choice. *Management Science* 43: 123–44. [CrossRef]

Xi, Dingli, Timothy Ian O'Brien, and Elnaz Irannezhad. 2020. Investigating the investment behaviors in cryptocurrency. *Journal of Alternative Investments* 23: 141–60. [CrossRef]

Yang, Heetae, Jieun Yu, Hangjung Zo, and Munkee Choi. 2016. User acceptance of wearable devices: An extended perspective of perceived value. *Telematics and Informatics* 33: 256–69. [CrossRef]

Yeong, Yoon Chow, Khairul Shafee Kalid, and Savita K. Sugathan. 2019. Cryptocurrency acceptance: A case of Malaysia. *International Journal of Engineering and Advanced Technology* 8: 28–38.

Yusof, Hayati, Mai Farhana Mior Badrul Munir, Zulnurhaini Zolkaply, Chin Li Jing, Chooi Yu Hao, Ding Swee Ying, Lee Seang Zheng, Ling Yuh Seng, and Tan Kok Leong. 2018. Behavioral Intention to Adopt Blockchain Technology: Viewpoint of the Banking Institutions in Malaysia. *International Journal of Advanced Scientific Research and Management* 3: 1–6.

Zahudi, Zalina Muhamed, and Radin Ariff Taquiddin Radin Amir. 2016. Regulation of Virtual Currencies: Mitigating the Risks and Challenges Involved. *Journal of Islamic Finance* 5: 63–73. [CrossRef]

Zeithaml, Valarie A. 1988. Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing* 52: 2–22. [CrossRef]

Zhao, Haidong, and Lini Zhang. 2021. Financial literacy or investment experience: Which is more influential in cryptocurrency investment? *International Journal of Bank Marketing* 39: 1208–26. [CrossRef]

Zmudzinski, Adrian. 2019. Malaysian Cryptocurrency Regulation to Classify Digital Assets, Tokens as Securities. Available online: https://cointelegraph.com/ (accessed on 20 January 2021).

Zulhuda, Sonny, and Afifah binti Sayuti. 2017. Whither Policing Cryptocurrency in Malaysia? *IIUM Law Journal* 25: 179–96.