# UNDERSTANDING MILLENNIAL INVESTORS' BEHAVIOUR TOWARDS CRYPTOCURRENCY AS AN INVESTMENT

UNIVERSITY OF WALES TRINITY SAINT DAVID

BY

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# ABSTRACT

This research is among one of the few studies conducted in Europe and study about millennial investors in the context of cryptocurrency investment. It has enriched readers' understanding with various areas that have a potential influence on millennial investors' perceptions of cryptocurrency investment, while validating its theoretical framework with the use of mixed-method.

The research aims to explore the perceptions and behaviours of millennial investors on cryptocurrency as an investment. This is achieved through research objectives by: reviewing previous literatures on cryptocurrency from millennials' perspectives, developing of a conceptual model in decision-making, identifying which factors have the most influence on millennial investors in cryptocurrency, and lastly, contributing findings to fill in gaps in the both academic and business aspects.

Among cryptocurrency users, most views it as an investment because they believe it offers financial inclusion, independence from governing bodies, and a secure means of preserving their funds. Moreover, when it comes to new experience, individuals would integrate their perceptions when determining their course of action. Therefore, Hierarchical Decision Modeling and anchored in the Theory of Planned Behaviour and Technology Acceptance Model were employed to clarify this problem. It critically reviews millennial-centric cryptocurrency literature, develops a decision-making model, and validates various technological, economic, social, and governmental aspects. In terms of methodology, the study has adopted a pragmatic and abductive approach.

Accordingly, a mixed-methods design has been employed, utilizing a sequential exploratory approach that commences with a qualitative inquiry and culminates in a quantitative analysis. A total sample size of 131 individuals which comprises a subgroup of 10 participants who partake in the qualitative phase of the study, followed by a larger cohort of 121 participants engaged in the subsequent quantitative phase. The deliberate division of participants into two independent samples has been undertaken as a precautionary measure given the mixed-methods nature of the study.

Qualitative analysis reveals that most respondents consider factors like price movements, trust in the system, influence from friends and family, and taxations as significant influencers of their

cryptocurrency investment decisions. At a 5% significance level, quantitative method establishes statistical significance for all independent variables, affirming the predictive value of price movements, trust in the cryptocurrency system, advice from their personal social circles, and tax policies in shaping millennial investors' perceptions of cryptocurrency investments. These quantitative findings corroborate the qualitative outcomes, reiterating that technological and governmental factors exert less influence on millennial investors compared to the aforementioned variables. This convergence between quantitative and qualitative findings underscores the robustness and consistency of the study's results, affirming the significance of friends and family as a driving force behind millennial investors' perceptions in cryptocurrency adoption and its ongoing influence on their investment perceptions.

With the dynamic of the study and its topic, it is useful for business to comprehend cryptocurrency investors' perceptions and behaviours for risk management, product development, building market strategies and customer service tailoring to market participants' needs.

**Keywords: millennials, cryptocurrency, perceptions, social, economic, technology, government.**

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# CHAPTER 1: INTRODUCTION

## 1.1. RESEARCH BACKGROUND

Globalisation 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. Cryptocurrencies and the technology that underpins them, namely blockchain technology, are developing into popular investment instruments; they are transforming the way financial services operate and accelerating the pace of digitalisation. Additionally, the COVID-19 pandemic has resulted in the implementation of quarantines and restrictions worldwide, an evolution in financial services was needed.

The advent of blockchain technology has been changing the structure of the financial sector. Cryptocurrency, which is a product of blockchain, has created a new revolution in peer-to-peer (P2P) technology. In 2017, the price of Bitcoin – a type of cryptocurrency – skyrocketed to over US$20,000 (Boxer and Thompson, 2020). Although there has been considerable interest in Bitcoin since its debut in 2008, it was the unexpected price movement that brought it to the attention of the general public.

Supporters of cryptocurrency frequently perceive it as a way to strengthen individual freedom because it provides a way to exchange a form of currency anonymously. Remarkably, cryptocurrency participation has been growing in emerging and developed economies, including Japan, China, India and Bangladesh among other countries in the Asia-Pacific region. There is a marked increase in the number of investors or active users (the number of active users has potentially reached 5.8 million) and employment has been generated in the cryptocurrency industry.

The decentralised system of cryptocurrency has made global monetary systems more dynamic and thus, cryptocurrency is more prone to misuse and it poses a threat to financial stability. There is a

need for governments to provide effective regulation to minimise the risks associated with this innovative payment system and to maximise its potential benefits. For example, the selling and purchasing of illegal goods on “Silk Road” (an online black market) using cryptocurrency has demonstrated its riskiness (Trautman, 2014). Additionally, the cryptocurrency market is relatively unregulated compared to traditional financial markets, which makes it vulnerable to market manipulation. Activities such as pump-and-dump schemes, false rumours and insider trading can artificially inflate or deflate prices, which lead to financial losses for unsuspecting investors. Therefore, cybercrime on cryptocurrency platforms is likely to occur due to operational issues, technical glitches or disruptions due to network congestion. Hackers and cybercriminals target cryptocurrency exchanges, wallets and individual investors to steal funds. The speculative nature of cryptocurrencies is itself a threat to cryptocurrencies. Many participants in these markets trade because they expect one or another cryptocurrency to increase in value; such collective excitement can lead to bubbles and subsequent market crashes.

Although cryptocurrencies bear uncertainties, they still have tremendous adoption among millennial investors. Millennials were found to be the main consumers and adopters of financial technology - Fintech (Chang et al., 2016). The global financial crisis of 2008 and subsequent economic challenges have contributed to a general sense of distrust among millennials towards traditional financial institutions. Millennials are often attracted to the investment potential of cryptocurrency. They are more likely to take risks and invest in assets with higher growth potential. Furthermore, millennials grew up in a digital-first world and are comfortable with digital currencies and online transactions. P2P communication and social media play a significant role in shaping millennials' opinions and behaviours. Peer influence may play a particularly important role in influencing new joiners to a cryptocurrency platform. The rise of social media platforms has facilitated the dissemination of information about cryptocurrency, which has led to increased awareness and interest among millennials.

Therefore, researching cryptocurrency investors can improve our understanding of their motivations, decision-making processes, risk tolerance and investment strategies. Central to these goals is understanding why investors decide to invest in cryptocurrency at a particular time. If the asset is new, or information about it has just been released, investment might be a rational response

to the present state of information. Other factors could include authorities endorsing the investment or big players making noticeably large bets on it. Another hypothesised source of collective optimism is peer influence among small investors. Moreover, analysing the behaviour of cryptocurrency investors can provide insights into market trends, such as the types of cryptocurrencies they prefer, their investment patterns and their response to market events. Furthermore, studying cryptocurrency investors can aid in identifying risk factors associated with the market, such as fraudulent activities, scams or market manipulation.

## 1.2. RESEARCH AIMS

The aims of this thesis are, first, to examine how millennials perceive cryptocurrency as an investment method, and second, to apply Kocaoglu's (2016) Hierarchical Decision Modeling (HDM) to understand the decision-making process of millennial investors in the cryptocurrency market.

Generally, one would consciously combine beliefs and values to conduct a course of action. When it comes to new experiences, especially with cryptocurrency investment, the thinking process from forming an attitude or perspective to making decisions might be longer than usual. According to attitudinal theories, attitude is the key variable of one's behaviour. There are also several other elements that affect one's behaviour, such as awareness, personality, personal experience, social influence, demographic, perceived benefits and risks. Nonetheless, the precise valuation of individual components remains elusive within the present literature. On the same page, the methodology by which these components are collectively assessed, whether in a simultaneous or sequential manner, as well as the hierarchical structures influencing one's decision about cryptocurrency remain rarely discussed. The characteristics of the HDM enable the unlocking of the goals, missions, objectives and factors that determine one's decision about cryptocurrency investment. It would further present the effects of the external environment and the internal perceptions of millennials when investing in this market.

## 1.3. RESEARCH OBJECTIVES

This research has four main objectives:

1. To critically review the literature on cryptocurrency from millennials' perspectives and millennials' decision-making models in relation to investing in cryptocurrency.
2. To build a conceptual model of the decision-making process that influences millennial investors in the cryptocurrency market based on HDM (Kocaoglu, 2016).
3. To develop a regression model to test the correlation between millennial investors' perceptions and independent variables. Additionally, to identify the factors that have the most significant influence on millennial investors to affirm the value of theory of planned behaviour (TPB; Ajzen, 1991) and technology acceptance model (TAM; Davis, 1989).
4. Last, but not least, to identify an academic gap from the conceptual framework and the final results, which will contribute to the academic research.

These four objectives are applied to achieve the main aims of the research. They represent four major steps of the research process: the literature review, a new conceptual model, data interpretation and the development of conclusions. My research objectives display the scope and depth of this research by focusing on millennial investors and dividing the thesis into major parts for a mixed methods study.

## 1.4. RESEARCH QUESTIONS

From the research objectives, these are the research questions to be addressed:

1. How do millennial investors interact with cryptocurrency technology?
2. What are the drivers for adoption and investment in the cryptocurrency market?
3. For what purpose or incentive do millennial investors use cryptocurrency?

## 1.5. RESEARCH PROBLEM

The selection of the current research began with an interest in new technology alonging with an interest in the claim that blockchain and cryptocurrency can revolutionise financial inclusion. The global financial system creates barriers that prevent unbanked people from participating in the economy. Africa has embraced cryptocurrency with a belief that it can build an alternative financial system that is more accessible and inclusive. This view was derived from cryptocurrency's decentralised nature, as it is not controlled by any governments or authorities (Mavilia and Pisani, 2020; Mazambani and Mutambara, 2019; Budree and Nyathi, 2023).

There is widespread agreement that millennials' behaviour and perceptions are strongly influenced by digital media because they were born into a world dominated by modern technologies; this distinguishes them from previous generations. Furthermore, millennials are the main adopters of Fintech, which is a critical aspect that drives the business strategies of Fintech companies and the banking system. Millennials demonstrate a stronger interest in cryptocurrency compared to previous generations (Patil, 2019). The socio-economic chaos of 2008 that millennials encountered had a strong influence on their decision to select Fintech products rather than products from traditional financial banks.

The purpose of this research is to investigate how millennials perceive cryptocurrency as an investment. There are certain risks related to cryptocurrencies, including regulatory risk, price volatility, market manipulation and cybersecurity. The majority of cryptocurrency users consider it an investment due to their belief that it is financially inclusive and offers freedom from the authorities. This belief is based on cryptocurrency's characteristics. Cryptocurrency is traded across a multitude of platforms, 24/7, and developed on blockchain (i.e., a decentralised system). Some cryptocurrency exchanges may promote that users can earn "interest" on their cryptocurrency deposits (Mattke et al., 2020); nevertheless, these are yield, not interest. In other words, the rate users receive on a cryptocurrency savings account is determined by the value of the coin, whereas traditional savings accounts offer a fixed rate of interest (Mattke et al., 2020). If cryptocurrency users or investors are not familiar with this, there could be a high risk of losses or

being deceived by a Ponzi scheme. Furthermore, volatile cryptocurrency prices combined with poor protection for investors might result in losses that affect major financial institutions or marketplaces. The relative obscurity of cryptocurrencies, as well as the public's and many financial sector workers' lack of knowledge of them, may exacerbate any consequent loss of confidence or drying up of liquidity and credit (Elliott et al., 2018). Not to mention, if the popularity of cryptocurrency grows rapidly, it could have a potential impact on financial stability.

Therefore, the author would like to identify the true reasons and which determinants affect millennial investors' perceptions that lead to an action in the cryptocurrency market. Previous research has tended to focus solely on one determinant, rather than testing various aspects to explain investors' perceptions and behaviour (Al-Mansour, 2020; Jalal et al., 2020). Likewise, researchers tended to focus on a particular period to capture the reason why investors chose to adopt Bitcoin or another cryptocurrency. For example, Alzahrani and Daim (2019) concentrated on the initial motivations, whereas Srivastava (2022) conducted quantitative research to understand investors' attitudes throughout their investing periods.

Two theories, TPB (Ajzen, 1991) and TAM (Davis, 1989), are integrated in this thesis to unlock the multiple layers of millennial investors' perceptions of the cryptocurrency market. This allows the author to identify millennial investors' flow of thinking process before and during cryptocurrency investment. This thesis also examines the external and internal factors related to cryptocurrency investment, such as economic, technological, social and governmental.

## 1.6. RATIONALE FOR THE STUDY

The rationale for the study is the lack of a comprehensive decision-making model for millennials in relation to cryptocurrency. Although there are a number of studies on the behaviour of cryptocurrency users or investors, these have focused mainly on how cryptocurrency users perceive benefits and their actions. Previous studies rarely concentrated on how cryptocurrency users or investors develop their goals in cryptocurrency platform, what are their objectives or view

the respondents' perceptions and behaviour in a systematic order. As a result, the need for the current study is self-evident. This study addresses this knowledge gap by developing a new decision-making model based on Kocaoglu's (2016) HDM.

## 1.7. MOTIVATIONS

### 1.7.1. PERSONAL MOTIVATION

Cryptocurrency has the potential to provide individuals who are unbanked or underbanked with the means to access financial services (Carmona, 2022). In many African countries, it is claimed that blockchain and cryptocurrency offer an opportunity to increase financial inclusion. To the best of my understanding, people in Africa can use cryptocurrency for savings, transactions, investment and other financial activities without the involvement of traditional banking. It is important to note that although there was a significant surge in the popularity of, and investment in, cryptocurrency during the period from 2017 to 2018, the cryptocurrency market has continued to evolve globally. Investors claim that cryptocurrency comes with a promise of security, an alternative income stream and it is free from government involvement (Baum, 2018; Veerasingam and Teoh, 2022; Murko and Vrhovec, 2019). Nevertheless, my curiosity stems from the question: Do investors adopt cryptocurrency due to a fear of missing out (FOMO), as a form of gambling or purely based on a belief in blockchain technology?

I am personally motivated to research cryptocurrency investors because I strongly believe that research can help us understand their motivations, decision-making processes, risk tolerance and investment strategies. This knowledge could be useful to financial institutions, regulators and policymakers to develop appropriate frameworks, guidelines and regulations for the cryptocurrency market.

### 1.7.2. ACADEMIC MOTIVATION

Most research publications on users' and investors' decision making on cryptocurrency investments rely on literature reviews to construct independent variables that are likely to influence cryptocurrency users' and investors' decision making. Additionally, independent variables are categorised to test elements in perceptual theories such as TPB (Ajzen, 1991), Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh et al., 2003) or TAM (Davis, 1989). Therefore, the results obtained are incomplete because they are only based on historical data. This has motivated me to utilise both a literature review and narratives captured from interviews to screen out the factors that influence millennial investors' perceptions. From there, my study will identify which factors have the most influence on cryptocurrency investors.

## 1.8. THESIS OUTLINE

The structure of this thesis is outlined below.

**Chapter 1. Introduction**

This chapter presents the context, the motivation and the importance of this research including:

- Research background, aims and objectives.
- Research questions –
    1. How do millennial investors interact with cryptocurrency technology?
    2. What are the drivers for adoption and investment in the cryptocurrency market?
    3. For what purpose or incentive do millennial investors use cryptocurrency?
- Research problem.
- Rationale for the study.
- Motivations: personal motivation and academic motivation.

**Chapter 2. Literature review**

This chapter reviews the relevant literature, drawing on the following research areas:

- Definitions of blockchain and Bitcoin, Bitcoin investment, government regulations about Bitcoin, Bitcoin investors' profile.
- Millennials including their characteristics; how millennials adopt technology and Fintech.
- Definition of attitude and factors affecting attitudes, especially investing attitudes.
- Definition of behaviour and factors affecting behaviour.
- Theoretical framework – TPB (Ajzen, 1991) and TAM (Davis, 1989).
- Decision-making model – HDM (Kocaoglu, 2016).

**Chapter 3. Conceptual framework**

A conceptual framework built upon the HDM by Kocaoglu (2016) and findings from the literature review are presented. Initial hypotheses were developed according to the conceptual framework.

**Chapter 4. Methodology**

This chapter highlights the methodology applied in this thesis. Key research methods include research paradigm, philosophy, approach, mixed methods, research strategy, interviews and survey questions.

**Chapter 5. Findings from the qualitative method**

This chapter presents the findings on the motivations and challenges related to millennial investors' perceptions of cryptocurrency investment. A conceptual model is constructed from the first findings of the study.

**Chapter 6. Findings from the quantitative method**

This chapter presents the findings from the regression model and the relationship between millennial investors and cryptocurrency investment.

**Chapter 7. Discussion of findings**

This chapter discusses the key findings of this thesis and evaluates each objective in detail.

**Chapter 8. Conclusion**

Finally, the conclusion chapter summarises the entire journey of the thesis. It discusses the contributions in terms of theory, methodology, conceptual model, recommendations and limitations.

# CHAPTER 2: LITERATURE REVIEW

## 2.1. INTRODUCTION

This chapter presents a literature review; it discusses previous studies, relevant theories and models applicable to the study of investors' perceptions of cryptocurrency investment. In this chapter, two important themes about theories and models are addressed. Firstly, a theoretical framework is built according to relevant theories about perceptions, attitudes and behaviour and in line with technology acceptance. Next, the second theme focuses on identifying which model and factors that determine millennial investors in cryptocurrency investment.

The chapter begins with an explanation of blockchain, Bitcoin and cryptocurrency concepts. Following is the background of Bitcoin investment and Bitcoin investors' profile. Previous academic research studies are examined to reveal millennials' characteristics and how they interact with Fintech. Subsequently, a theoretical framework is built by incorporating relevant theories (TPB and TAM) and HDM (Kocaoglu, 2016). From the HDM, this paper identifies potential determinants affecting millennial investors' perceptions of adopting cryptocurrency. The determinants will be divided into four major categories: economic, technological, social and government. Economic factors refer to how millennial investors perceive investing opportunities and benefits in terms of money. Technological factors refer to the security of the cryptocurrency system, investors' control, and safety. Social factors refer to how the external environment can influence millennial investors, especially friends and family members. Last, government factors refer to how millennial investors respond to regulations and potential political risk when investing in cryptocurrency. Therefore, this chapter presents a broad picture of cryptocurrency investment, the investors' profile, determinants that influence millennial investors and it develops a theoretical framework to build a conceptual framework for the next chapter.

## 2.2. WHAT IS CRYPTOCURRENCY?

### 2.2.1. BLOCKCHAIN

Blockchain is considered a new method of record keeping and it functions as a ledger. Instead of a centralised mechanism, in which one entity looks after the books, blockchain is a decentralised system that contains numerous computers working to distribute the shared ledger through a consensus-based algorithm; blockchain allows data to be stored and transferred on a P2P basis. Blockchain is able to perform in a decentralised and ongoing manner because of miners; miners store information and run algorithms that authorise data per block. After verification, a block will be added to the blockchain and shared within that network. Blocks are linked together in such a way that if information in a block has to be changed, then the whole blockchain would be changed.

The blockchain protocol is used as software for the majority of common cryptocurrencies, such as Bitcoin, Ethereum and Factom. The Bitcoin network has nearly 5,000 full nodes and has been used to invest in the blockchain stock market since 2009 (Yanardağ, 2019). The Ethereum network also has nearly 5,000 complete nodes, but differs from Bitcoin in that it incorporates a scripting language into the blockchain framework (Yanardağ, 2019). Ethereum's success stems primarily from the development of smart contracts and decentralised autonomous organisations. Bitcoin and Ethereum are available all over the world. The Factom network, on the other hand, is made up of federated and unlimited nodes. The Factom, which was designed for stable data and systems, employs a simpler consensus mechanism, integrates polling, and stores significantly more information.

### 2.2.2. BITCOIN AND ALTCOINS

Bitcoin was introduced by Satoshi Nakamoto in 2008 after the Great Crisis. Since then, Bitcoin has risen as the most traded and popular coin with 80 percent of market share (Ciaian et al., 2018). Businesses around the world have started accepting Bitcoin as a form of payment because of its definite supply. Moreover, Bitcoin is claimed to have an ability in solving the double-spending problem without a centralised entity (John et al., 2022). With the global success of Bitcoin, an emergence of alternative cryptocurrencies or alternative coins has arisen among cryptocurrency

users and investors. The most popular alternative cryptocurrencies in 2024 are Ethereum, Tether and Binance coin, which most of them are relying on identical blockchain technology as Bitcoin. These alternative cryptocurrencies are designed to be scalable, high liquidity and secure. Additionally, purchasing or investing in popular alternative cryptocurrencies is more cost-effective comparing to Bitcoin.

According to Ron and Shamir (2012), Bitcoin is a digital currency that is not issued by any government, bank or organisation; Bitcoin is based on cryptographic protocols and dispersed networks of users for mining, storage and transfer. Hayes (2015) asserted that Bitcoin is not a legal currency, it is classified as a digital version of money or known as digital money. Put simply, we can separate the term Bitcoin into two words: bit and coin. Based on IT field, bit stands for binary digit, which is a unit of measurement of information in computers like byte, kilobyte or megabyte. Bits are considered to be the smallest units of measurement. Coin represents copper money. Combining the two words bit and coin, we get the term Bitcoin that can be roughly translated as 'digital money' operating on blockchain technology. However, the word coin in Bitcoin can be misleading and lead to incorrect names, such as virtual money or electronic money. Bitcoin is a cryptocurrency. Steve Wozniak, the co-founder of Apple, thinks that Bitcoin was several times better than gold or US dollars (Kharpal, 2018). This is because Bitcoin has limited quantity in the cryptocurrency market. Thanks to its finite characteristic, Bitcoin does not create inflation. As a finite number of 21 million Bitcoins were issued, and they are not controlled by any government or regulations, when there is an increase in demand for Bitcoin, no one can increase the amount of Bitcoins (Barone and Masciandaro, 2019). In comparison with government currencies, they can be diluted and declared dead at any time. In addition, governments may issue new currencies due to political factors, and gold can be mined.

Beside Bitcoin, Altcoins or Alternative coins are the term that refers to other types of coins that are not Bitcoin. According to Cagli (2019), Altcoins are constantly developed with advanced algorithm and features as fast transaction or unique distribution method. An example of altcoin is Ethereum. As the top second of most traded coin, Ethereum is a smart contract that uses blockchain technology. Ethereum is claimed to serve a dual purpose of allowing users or traders to trade across

multiple chain on blockchain and supporting decentralised financial contracts (Tikhomirov, 2018). In particular, these decentralised contracts are tamper-proof, which cannot be amended or erased to avoid fraud and ensuring the security of contracts. Furthermore, there is a type of altcoins that is following fiat currency fluctuation called Tether. Cryptocurrency investors and traders consider Tether as the stable coin and it is the third largest cryptocurrency in the market. Tether is developed to maintain a stable value by being pegged to the US dollars (Wei, 2018). What's more, the world most popular cryptocurrency platform – Binance – has its own coins called Binance coin. Binance coin was initially built on Ethereum network, however, it is operating on Binance's blockchain at the present (Mallick, 2020). Binance is used for payments on Binance chain as well as entertaining purposes and other financial services.

Not to mention, cryptocurrency has market cap that classifies cryptocurrency into three categories: large-cap cryptocurrency, mid-cap cryptocurrency and small-cap cryptocurrency. Cryptocurrency that has more than 10 billions USD is categorised as large-cap cryptocurrency. For example, Bitcoin, Ethereum, Tether and Binance coin are large-cap cryptocurrency. This type of cryptocurrency associates with lower risks as it is highly liquidated and having a track-record of growth (Coinbase, no date). Because of this characteristic, large-cap cryptocurrency is gaining favours from market participants.

Below are the table of top traded cryptocurrencies in 2024 according to Coinmarketcap.com:

| # | Name | Price | 1h % | 24h % | 7d % | Market Cap | Volume(24h) | Circulating Supply |
|---|---|---|---|---|---|---|---|---|
| 1 | Bitcoin BTC | $70,456.41 | 0.57% | 0.44% | 6.53% | $1,386,608,147,916 | $28,810,248,108<br>406,936 BTC | 19,680,368 BTC |
| 2 | Ethereum ETH | $3,494.63 | 1.15% | 1.94% | 8.36% | $419,603,419,450 | $12,886,547,286<br>3,665,266 ETH | 120,070,963 ETH |
| 3 | Tether USDT | $0.9997 | 0.02% | 0.03% | 0.07% | $107,270,374,808 | $55,217,731,265<br>55,233,996,539 USDT | 107,306,343,185 USDT |
| 4 | BNB BNB | $617.13 | 0.67% | 3.01% | 7.23% | $92,282,210,578 | $1,644,696,242<br>2,655,150 BNB | 149,534,435 BNB |
| 5 | Solana SOL | $170.40 | 1.31% | 1.04% | 0.79% | $75,992,376,157 | $2,467,656,102<br>14,422,376 SOL | 445,964,270 SOL |
| 6 | XRP XRP | $0.6029 | 0.86% | 1.85% | 5.44% | $33,189,869,878 | $1,193,295,161<br>1,973,796,429 XRP | 55,051,549,471 XRP |

Figure 2.1. Top most traded cryptocurrency in Q1 2024 – Source: Coinmarketcap.com

The top traded coins are calculated basing on the price of the coin multiply with the number of coins that are in circulation. This will derive its market cap, which is demonstrated in figure 2.1. For example, Bitcoin is in the top 1 because it has the largest market cap of $1,386,608,147,916. If the market cap of a coin is larger than 10 billions USD, it means that the coin is belonged to large-cap category.

For mid-cap cryptocurrency, the market cap is usually between 1 to 10 billion USD. On the other hand, cryptocurrency that has less than 1 billion USD in market cap is classified as small-cap cryptocurrency. Small-cap cryptocurrency carries high uncertainties due to its dramatic swings based on market sentiments. With the aim to guide investors, previous studies on investment provided validated and relevant investment information, including ratings or credit scores from third parties and intermediaries (Hoegen et al., 2018), which are scarce for cryptocurrency.

Cryptocurrency investment appears to be more appealing to investors because it operates without an intermediary. Investors do not need to assess or rely on the competence of a management team, but rather a decentralised blockchain application. Interestingly, Bouri et al. (2018) argued that Bitcoin is a shelter from the sovereign risk and fragility of the global financial system, which was evident during the European debt crisis from 2010 to 2013 (Luther and Salter, 2017). The fact that Bitcoin is insulated from economic and financial variables makes it a valuable diversifier, especially during a stock market downturn (Corbet et al., 2018; Bouri et al., 2018; Dyhrberg, 2016). Moreover, it was proved that Bitcoin has a weak correlation with other financial assets as Bitcoin

does not share many common price determinants with other financial assets (Bouoiyour et al., 2016; Kristoufek, 2015). Indeed, the price of Bitcoin depends more on its characteristics that combine user anonymity (Ober et al., 2013), algorithms (Yelowitz and Wilson, 2015) and attractiveness (Kristoufek, 2015).

Sas and Khairuddin (2017) reported that Bitcoin users mostly utilised cryptocurrency for investment and stored coins as a way to protect savings. Moreover, Bitcoin is a non-interest-bearing currency with no widespread credit system. Therefore, setting short-term interest rates imposes no effects on Bitcoin as it does on fiat money. As a matter of fact, the purchasing power of Bitcoin is not diminishing, while fiat currency is hit with inflation. Moreover, research by Presthus and Malley (2017) undertaken to investigate cryptocurrency adoption motives and what could facilitate adoption yielded insightful results. The use of cryptocurrency is being driven by technological excitement as well as investment opportunities (Presthus and Malley, 2017). Stability, security, acceptance as a payment mechanism and currency, usefulness, ease of use, simple laws and regulations, and accessibility are all factors that would inspire and promote adoption. Bohr and Bashir (2014) investigated the Bitcoin culture and discovered three primary reasons for adoption: privacy, independence and a lack of confidence in the financial system. Importantly, trust is a strong selling point for users and investors to adopt Bitcoin. In their report "Blockchain for Social Impact", Galen et al. (2018) pointed out that three components are required to establish trust: identification, ownership and authorisation. All users and investors can access blockchain easily as long as they have their identities proved along with protection of their ownership for digital assets and a low-cost intermediary for verifying transactions. The security factor of Bitcoin attracts new users as well as maintaining trust among investors. Furthermore, the economic factor is also considered one of the determinants of people's intention to invest in cryptocurrency.

### 2.2.3. GOVERNMENT REGULATION ABOUT CRYPTOCURRENCY AND CRYPTOCURRENCY INVESTMENT

Cryptocurrencies and associated blockchain systems are governed by a plethora of governmental bodies around the world, each of which has enacted its own set of rules and regulations. Countries

hold a diverse range of viewpoints. Some are extremely conservative and outlaw or seriously restrict all blockchain trading and initial coin offerings (ICOs). Others remain largely uninvolved. Other authorities have yet to say whether they will take any action.

The most influential cryptocurrency authorities in Europe and the US are now taking opposing views on rules and standards. In Europe, where supervision is delegated to individual countries, the German Federal Financial Supervisory Authority contends that cryptocurrencies must adhere to current rules and regulations (Hammond and Ehret, 2022). In the US, interagency authorities are open to further analysing digital currencies as the laws grow. Since neither Europe nor the US has a robust regulatory system, most sovereign regulators will appear to obey the guidelines established by one of these two dominant boards, which implies that policies will possibly vary on either side of the Atlantic. However, the Federal Reserve Bank of Boston in the US reported that more than 30 separate blockchain networks are being tested along with MIT's Digital Currency Initiative to see if a digital dollar can be sustained (Mogul et al., 2020). The government of China has planned to become the world's first country to sell a digital sovereign currency by revealing their global yuan plans. Besides China and the US, other central banks are expected to launch their first central bank digital currencies in the future (Mian, 2020).

As cited from Mogul et al. (2020), The Basel Committee on Banking Supervision reported that crypto-related assets “do not efficiently have the standard functions of money and are risky to rely on as a means of trade or store of value” (Mogul et al., 2020, page 1). It recommended four practices for each offering: due diligence for any cryptocurrency provided to clients, an internal governance and risk control system, transparency of all relevant operations in financial reporting, and adequate dialogue with regulatory supervisors. Mogul et al. (2020) recommended that banks establish their own coherent rules because there is no simple uniform regulatory framework. They should first build a regulatory heat map and do a gap study. This combined exercise should cover the most applicable regulations in each country, forecast possible developments and outline regulatory differences (the discrepancy between current standards and expected changes) (Mogul et al., 2020). Second, banks should provide a risk assessment diagnostic for their own operations. They can define and prioritise cryptocurrency programs throughout this exercise. They can then make a list of the main sources of knowledge and technologies needed for these goals. A strategy

for implementation must be developed, outlining the measures needed to comply with existing and expected regulations. Stringent software can be created to store important milestones such that the work can be recovered (Mogul et al., 2020).

The United Kingdom (UK) is one of countries that support Bitcoin. The UK thinks that Bitcoin is full of potential; it considers Bitcoin to be a financial revolution that helps fight crime, hacking and other problems faced by banks and other financial institutions. The move in favour for Bitcoin was shown by a removal of tax policies related to Bitcoin after Mt. Gox announced its closure. The UK's HM Revenue and Customs (HMRC) declared it would not levy a 20% tax on Bitcoin transactions, but capital gain tax is applied for gains that exceed £6000 (Russel-Jones, 2023). These actions were the authorities' response to letters of complaint from trading firms about taxes that reduced UK's competitiveness in Bitcoin transactions in relation to other countries, which would make it likely that business would be transferred to other countries. Great Britain can take advantage of Bitcoin as a form of innovative leap in gross domestic product (GDP), economic development and finance after withdrawing from the European Union (EU).

The Japanese government recognises Bitcoin as a currency, and it was accepted as a means of payment on April 1, 2017 (Garber, 2017). Its "Virtual Currency Act" passed in 2017 has made all corporations and institutions operating in the field of digital currencies had switched to invest in Japan (Edwards et al., 2019). According to Wada et al. (2017), in early October 2017, the Japanese Financial Services Agency officially recognised 11 companies that are registered as operating virtual currency floors. The registration requires these platforms to comply with many regulations, such as having a stable computer system and checking user profiles to avoid money laundering. Subsequently, investors are fully protected from fraud thanks to these regulations as well as the advancement of Fintech.

China and South Korea are two countries that have taken separate regulatory approaches. Although China is planning to introduce its global yuan, the government imposed major bans on its residents from trading cryptocurrency yet it promotes blockchain experimentation. This strategy can best be summed up by the comments of China's Deputy Governor, who said, "The only thing to do is sit

by the riverbank and wait for Bitcoin's corpse to float past" (The Economist, 2018, page 1). On the other hand, South Korea originally took a liberal approach to crypto-asset control, but in January 2018 it proposed a cryptocurrency moratorium. Afterwards, the government rescinded the proposal and declared that cryptocurrency trading accounts must be recorded with traders' real names and that capital gains taxes must be paid on cryptocurrency transactions. The government is also contemplating a ban on the issuance of tokens through ICOs (Edwards et al., 2019).

Other countries like Switzerland, Singapore and Malta developed specialised regulatory frameworks in order to draw market activity as cryptocurrency hubs, however, in Bangladesh, Kyrgyzstan and Bolivia, the governments banned cryptocurrencies outright (Feinstein and Werbach, 2021).

Additionally, there was an investigation by The Foundation for Defense of Democracies' Centre on Sanctions and Illicit Finance, in collaboration with Elliptic, a cryptocurrency analytics provider, into the illegal laundering of Bitcoin, which was discovered because of geographic variations in volume that can be clarified in part by various regulatory approaches. They investigated the illicit flows of Bitcoin through conversion services or platforms where users can trade cryptocurrency for fiat currency, cryptocurrency for cryptocurrency, or cryptocurrency to other users (Dewey, 2019). According to Dewey (2019), it was found that the second-highest volume of illegal Bitcoin circulated in conversion services in Europe behind only those conversion services whose operational authority could not be determined. However, Europe has recently introduced laws to incorporate cryptocurrency companies, such as exchanges, under the framework of the 5$^{th}$ Anti-Money Laundering Directive.

Many countries, like the US, control blockchain practices differently, such as the exchanging of cryptocurrency for fiat or cryptocurrency for cryptocurrency. Any exchanges that provide services that do not clearly fall into the existing regulatory framework have voluntarily established stringent protocols to check the identity and source of funds of their customers. It is worth noting that while Europe has the second-highest exposure to Bitcoin laundering, this illegal operation accounted for just a small portion of the total Bitcoin volume obtained by conversion providers.

## 2.3. BITCOIN INVESTORS

It is estimated that the global user base of all cryptocurrencies increased by nearly 190% between 2018 and 2020 (de Best, 2023). However, there is lack of research about Bitcoin investors and other cryptocurrency investors due to the scarcity of data collection and Bitcoin's anonymity feature.

In terms of Bitcoin investors' profile, cryptocurrency investments are a male-dominated operation (Hasso et al., 2019; Lammer et al., 2019; Dorn Jones et al., 2015). In addition, previous research has found that the traits of Bitcoin investors differ substantially from the traits of general investors: Bitcoin investors are younger (Bohr and Bashir, 2014), have an irrational confidence in simple money (Pezzani, 2018), are more risk averse (Conlon and McGee, 2020), and have the psychology of FOMO (Pichet, 2017). It was also pointed out that Bitcoin users who are in their late 30s are more optimistic about Bitcoin performance over the long run compared to younger and older users (Bohr and Bashir, 2014). This indicates that the age of Bitcoin investors has a nonlinear relationship with predicting optimism towards Bitcoin.

Moreover, by assessing the administrative data from a random sampling of customers of a major German online bank, which described investors' holdings and trading of cryptocurrency-structured retail goods, Lammer et al. (2019) found that investors who are active and self-directed are more likely to be early adopters of cryptocurrency investments. Lammer et al. (2019) provided new data not only on cryptocurrency investors' features, but also on their investing conduct. In their study, they classified 31 cryptocurrency-related assets and noticed that most of the value-based portfolios were clustered around three investment vehicles. Cryptocurrency investors in Lammer et al.'s (2019) study have more gross funds under control than non-cryptocurrency investors.

According to Pezzani (2018), Bitcoin investors' misplaced confidence in its eternal rise has led them to overvalue the margin derived from speculation. Risk tendency, which is related to

sensation-seeking, is a desire to take on more risk during a time of high volatility because the trader finds trading entertaining and relaxing (Mai, 2019). A risk-seeking investor will be more enthralled by Bitcoin investing due to its fast-paced, diverse world (Mai, 2019).

Furthermore, it was recorded that the key cause of a speculative bubble is FOMO, which is exacerbated by media coverage of Bitcoin (Pichet, 2017). Bitcoin curiosity, as calculated by Google Trends search queries and frequency of visits to Wikipedia, was associated with Bitcoin prices (Kristoufek, 2013). The number of tweets about Bitcoin has a significant impact on the next day's Bitcoin market trading volume as well as realised volatility (Shen et al., 2019). Moreover, Bohr and Bashir (2014) pointed out that by participating in Bitcoin-related online communities, investors expected optimistic Bitcoin accumulation.

Lammer et al. (2019) proved that cryptocurrency investors favour assets with strong skewness and are more inclined to chase patterns by regressing cryptocurrency investment on predictor variables for past occurrence of investment prejudices in transactions prior to individuals investing in cryptocurrencies. They discovered that the average cryptocurrency investor dramatically raises operations after making their first cryptocurrency buy. This is consistent with recent literature on expectation and trading activity (Olafsson and Pagel, 2023; Sicherman et al., 2016), as well as with studies on institutional investors' trend-chasing and overtrading conduct (Barber and Odean, 2008).

Furthermore, Lammer et al. (2019) also examined cryptocurrency investors' past trading and fund selection activities. They found that cryptocurrency buyers are more likely to exchange penny stocks and stocks associated with pump-and-dump schemes. Cryptocurrency investors have a preference to invest in other high-risk investment opportunities, such as emerging market, pharmaceutical and solar-related exchange-traded funds (Lammer et al., 2019). In their research, cryptocurrency investors were found to have higher portfolio but lower portfolio performance, as calculated by relative Sharpe ratio losses, when the portfolio-return profiles of cryptocurrency and non-cryptocurrency investors are compared. Though prior research indicates that cryptocurrency may be used as a diversification tool (Bouri et al., 2018), cryptocurrency investors in Lammer et

al.'s (2019) study underperformed due to investment biases. They claimed that cryptocurrency investors are more susceptible to conventional investing prejudices like trend following and lottery stock preferences. Additionally, Oehler et al. (2018) proposed that more extraverted people would pay higher premiums for, and purchase more, financial assets as assets become overpriced, which explains why Bitcoin investors have invested in Bitcoin amid the formation of a price bubble.

In terms of cryptocurrency investors' experiences with other investment funds, gambling expertise, trading practices and investment plans, there was no substantial distinction between Bitcoin and share investor categories (Kim et al., 2020). However, Bitcoin investors were proved to have higher K-CPGI (the Korean version of the Canadian Problem Gambling Index) ratings, history of loss, percentage loss, trading volume and problems due to investments than the share investor community (Kim et al., 2020). This was tested by assessing the Cloninger's Temperament and Character Inventory of the respondents in Kim et al.'s (2020) study. The results indicated that Bitcoin investors who have higher novelty seeking index and lower cooperativeness index have a tendency to invest in Bitcoin as gambling. Furthermore, the Bitcoin respondents invested less and for a shorter period of time compared to the share investors group (Kim et al., 2020). These characteristics of Bitcoin investors are similar to those of day traders. Day trading is a highly competitive trading technique focused on short-term commodity price fluctuations in which traders purchase and sell the same financial assets regularly during the day in order to benefit from each trade (Ryu, 2012). They apply contrarian tactics rather than momentum strategies in the short term (Chung et al., 2009). Despite the fact that they spend more time investing and incur more in exchange fees, they do not make more money than most buyers (Markiewicz and Weber, 2013). Day trading volume rises as gamblers' proclivity to take risks rises (Markiewicz and Weber, 2013). Day traders in the stock market favour lower-priced, more liquid and volatile stocks on which to pursue greater profit opportunities (Chung et al., 2009). Because of its high volatility, the Bitcoin market is projected to be more common with day traders than with the equity market.

Furthermore, adoption of technology is a significant determinant of cryptocurrency investments. Investors of cryptocurrency portfolios are more likely to have used the bank's mobile banking or mobile trading app (Lammer et al., 2019). Likewise, consumer sentiments from social media and web portals influence Bitcoin rates (Kristoufek, 2013; Kinderis et al., 2018; Rahman et al., 2018).

Market characteristics such as ease of internet access, clear subscription and qualification processes, and 24-hour availability affect investor motivations as well. An earlier analysis of online trading discovered that young risk-taking participants were more likely to use online trading (Li et al., 2002). Nevertheless, Lammer et al. (2019) declared that the use of robo-advice providers is scientifically irrelevant to cryptocurrency investments. Their results indicated that although technological adoption is a significant predictor of growth, the form of technology is also important since cryptocurrency investors are more likely to actively manage their own portfolios.

Studies on cryptocurrency investors' behaviours and investing strategies have not covered the area of knowledge related to the crypto coin or cryptocurrency investors' response to government regulations. In addition, the profile of Bitcoin investors was not Millennials; for example, Kim et al. (2020) gathered their respondents from a group of registered members in a Korean research operation who were a minimum of 20-years old.

However, the respondents in the study of Lammer et al. (2019) were customers of a large German online bank and they invested directly on the bank's online platform. This suggests that these respondents favoured Fintech and they might have knowledge about blockchain and cryptocurrency technology. Lammer et al. (2019) confirmed that investors who invest in both cryptocurrency and the stock market would diversify their portfolios and invest in low-value coins or penny stocks. Moreover, respondents in Lammer et al. (2019)'s have strong understanding about the market and possess clear goals for their investments. Hence, these behaviours and characteristics of Bitcoin investors in Lammer et al.'s (2019) study could identify the investing decisions and behaviours of millennial investors in this research. Nevertheless, to justify this concept, the author will relocate the analytical lens to the psychological side, that is, to attitudes and perceptions in order to examine what drives the behaviour of millennial investors towards Bitcoin investment.

## 2.4. MILLENNIALS

Many propose that people born in and after 1982 belong to this group, however, others suggest that millennials are individuals born between 1980 and 2000. Foot and Stoffman (1998) suggested that the birth range of millennials is from 1980 to 1995. He also referred to them as the "baby boom echo" as millennials are the children of the baby boomers (1946–1965). In this paper, millennials age range is defined according to Foot and Stoffman (1998).

In 2020, nearly a quarter of the world's total population was classified as millennials. In the US, millennials became the largest generation and overtook the baby boomer generation. Based on the number of millennials and their prime working-age status, millennials have been the centre of attention of news articles and of industry studies on the expected effects of generational transition on economic activity.

Millennials, the first technology natives, have distinct characteristics that seem to put them at an advantage in deciding social change, especially at a time of technological disruption. Millennials are digitally literate and tech savvy since they have spent their whole lives engulfed in technology and are in direct interaction with new media, technologies and the internet (Howe and Strauss, 2003). In reality, they are the first high-tech generation and, as a result, they can be referred to as "digital natives" (Godelnik, 2017). Therefore, they commonly have a clearer perspective of, and positive attitude towards, new technology. This perspective and attitude control their behaviour, such as accepting the involvement of technology on a daily basis, and adoption of technology. In order to gain deeper knowledge about this field, section 2.4.1. provides further information on the reasons why millennials are called digital natives and how they perceive technology differently from other generations.

When studying about financial management in millennials, Saputra (2024) mentioned that millennials have a well-structured financial plans and goals by setting budgets for investing and savings. Millennials were found to have substantial interests in stocks, mutual funds, cryptocurrencies and real estate. According to the report on millennial clients from EY Wealth Management department, it is record that millennials have higher risk appetite toward alternative investments and the use of digital wallets (Lee et al., 2023). In Astati (2023)'s research, millennials

are drawn to innovative products and high-risk investment assets such as cryptocurrency or technology stocks. When it comes to investing, millennials exhibit a noticeable lack of predictability along with a heightened level of sensitivity. It seems that millennials respond to volatility forcefully and inconsistently (Lee et al., 2023). In response to market shocks, no less than 50% of millennials (or 34% of all clients from EY Wealth Management) has decided to protect their capital by savings. On the other hand, the other half has increased their allocations to actively managed assets despite the volatility. This has demonstrated through the pandemic Covid-19 when millennials have experienced with laid-off from work, reduction in income, elevated inflation with a costly rate of borrowing. Tahang and Sukardi (2023) emphasised that difficult economic conditions have risen millennials' awareness of personal finance and managing uncertainties.

Millennials are also preparing for their futures with financial planning (Kettunen and Kriikula (2020) ). By looking at Finnish pension system, millennials were found to own doubts about the efficiency of using pension scheme together with its duration (Kettunen and Kriikula, 2020). This, further, suggests millennials might look for an alternative source of investment or safe haven for their future finance. From the work of Sabri (2016) and Putra et al. (2021), it is found that the level of financial literacy has significant influence on millennials. When studying about millennials in Malaysia, findings on millennials' behaviour were categorised into 2 different flows. Millennials who are equipped with advanced financial literacy have the tendency to choose risky investment and vice versa. In which, theory of behavioural finance comes to verify that cognitive ability and financial literacy impact on individual's risk appetite (Sabri, 2016). Putra et al. (2021) elaborated on this point and shared that millennials, likewise, refer to reliable source of information when investing in risky assets. In alignment with Sabri (2016) and Putra et al. (2021), the level of financial literacy reveals millennials' ability in making sound investment in stock market (Rosdiana, 2020). It is claimed that millennials are willing to invest in definite stocks if the expected return is highly secured. Their willingness is developed from risk assessment with the use of financial knowledge (Rosdiana, 2020). Additionally, millennials prefer to express their opinions about finance on social media. A report presents that two-fifth of financial conversations on Facebook belong to millennials (Baker et al., 2017). Millennials are inclined to read and analysis financial blogs from investment firms, ideally from reliable financial sources (Baker et al., 2017).

The combination of being tech-savvy and have interest in finance, millennials demonstrate a robust enthusiasm for fintech – financial technology. Their interests stem from the ease of technology and generating revenues function of fintech. Considering Daquar et al. (2020)'s work in Palestine, millennials were recorded to stand in the first place, which surpassed Gen Z in utilising Fintech. Not only in Palestine, but also in Poland, millennials heavily favour Fintech services (Solarz and Swacha-Lech, 2021). Fintech was adopted by millennials to pay tuition fees or managing their business payrolls through e-Wallet (Daquar et al., 2020). The strong inclination towards fintech stems from cost efficiency that is lack from traditional banking system. Notably, male millennials who are high earners account for the majority of fintech users in Poland (Solarz and Swacha-Lech, 2021). These individuals value the advancement of technology and they use social media as the main source of financial advice.

To gain deeper insights about millennials, it is worthwhile to study about their behaviour and attitudes. In 2014, Lyons and Kuron (2014) examined data on other personality trait shifts in millennials and discovered rising levels of neuroticism, narcissism, self-confidence and self-assuredness. The differences between the personalities of millennials and other generations can be explained in part by the fact that they were raised in a comparatively middle-class environment, where they were encouraged to be assertive and to challenge anything, and they were often told that they could do whatever they set their minds to (Twenge and Campbell, 2008; Twenge, 2013). The prevalence of social platforms has led to millennials' optimistic self-views and self-enhancements (Barker, 2012; Gentile et al., 2012), and, as a result, egos are on the increase, and millennials have been recorded to self-describe themselves as more individualistic (Twenge et al., 2012). When investing in equities market and mutual funds, millennials' attitude and subjective norms have a direct influence on their intention to invest (Sumiati et al., 2021) ; Mahardhika and Zakiyah, 2020). Not to mention, millennials' religion plays an important role in their intention to invest. By adopting the extended Theory of Reasoned Action, Sumiati et al. (2021) points that Muslim religiosity has an influence on millennials' intention to invest; while, Islamic financial literacy does not have significant influence. At the same time, risk perception is considered when millennials make investment decision (Rosdiana, 2020).

Additionally, millennials are often advised to choose initiative over accomplishment and are frequently praised for commitment rather than results. Therefore, failure and success are less significant, and this “praise for anything” mentality fosters the growth of high self-esteem, a strong desire for consistent praise and a strong sense of entitlement among millennials (Twenge, 2013). As a consequence, the millennial generation tends to associate initiative with efficiency; a fallacy that prompted Hill (2002) to coin the term ability–performance nexus.

These changes in identities have also influenced millennials' work and career preferences. Ng et al. (2015) investigated the career aspirations of millennial post-secondary students in Canada and discovered some interesting findings. For example, millennials have unrealistic assumptions of pay and advancement: two-thirds of millennials polled hoped to be promoted within the first 15 months of starting their first job. They also anticipate a 63% rise in their pay over the next five years (Ng et al., 2015). In the same survey, millennials ranked “opportunities for advancement” as their top priority when choosing an employer. Similarly, Ng et al. (2015) discovered there was no association between millennials' academic success and their salary and promotion goals, which correlates with Hill's (2002) ability–performance nexus characterisation of the millennials. In another study, Westerman et al. (2011) found that increasing levels of narcissism among millennials are linked to perceptions of ease in career hunting, pay and promotions.

Interestingly, an MSCI (2020) report recorded that millennials have the highest level of education compared to other generations. More than half of the world's millennials completed upper secondary school, and almost a fourth have completed post-secondary schooling, whereas previous generations fell well below these educational standards in 2020 (MSCI, 2020). Furthermore, the educational level of millennials often represents a larger social story on a global scale. For the first time in history, women are outpacing men in education. According to MSCI (2020), women in the millennial generation are more educated than men in North America, Latin America, Europe and Oceania. In Asia, the educational achievement gap between men and women is narrower but still important. Women millennials have lower educational levels than men only in Africa. As women achieve higher educational standards than men around the world, demographic evidence shows that their effect on cultures, from politics to grassroots activism to individual decision making, would be greater for millennials than previous generations.

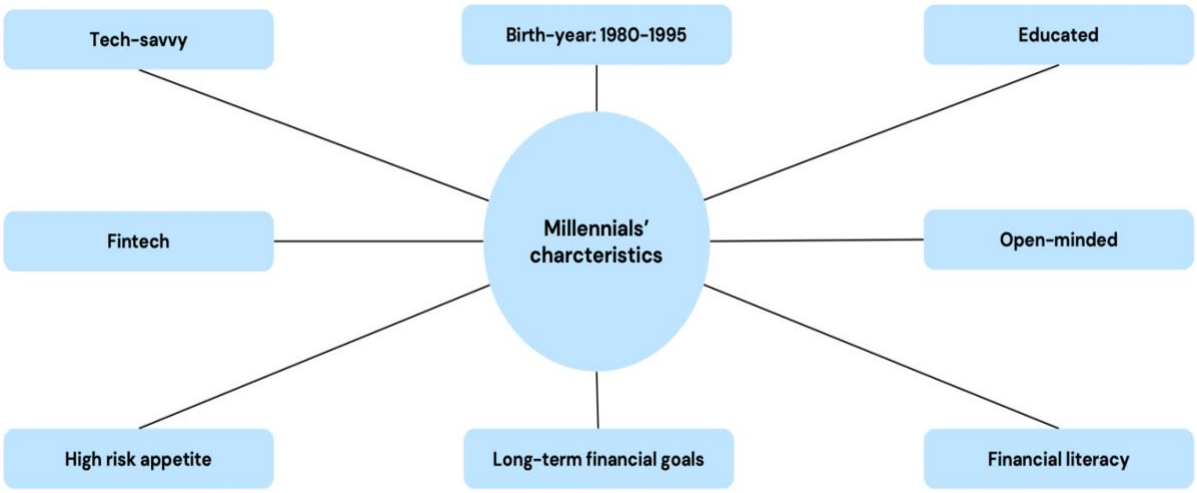


Figure 2.2. Millennials' characteristics – Source: from the research

In figure 2.2, millennials' characteristics were demonstrated through a collective of reviewing previous research about millennials. For instance, in the research from Howe and Strauss (2003), Goldelnik (2017) and Astati (2023), millennials are described to be tech-savvy. Millennials have high risk appetite, financial literacy and a tendency in planning for long-term financial future demonstrated in Astati (2023), Lee et al. (2023), Saputra (2024), Kettunen and Kriikula (2020), Tahang and Sukardi (2023), Sabri (2016) and Putra et al. (2021). This generation is, likewise, claimed to be open-minded, educated and have strong interest in Fintech in Daquar et al. (2020), Solarz and Swacha-Lech (2021), Barker (2012), Gentile et al. (2012) and MSCI (2020).

In summary, millennials are poised to reshape the economy. They were born during the early stages of Industry 4.0 and have grown up in an age of accelerated transition, which has given them values and aspirations that are vastly different from those of previous generations. The transformation of lives through technology and digitalisation could help millennials accelerate social change, especially in comparison to other cohorts. Moreover, as millennials are identical in their characteristics compared to other generations, there is a chance that their behaviour would be highly different from other cohorts.

### 2.4.1. MILLENNIALS AND TECHNOLOGY ADOPTION

There is widespread agreement that being born into a world dominated by modern technologies, millennials' behaviour and perceptions are strongly influenced by digital media and this makes them distinct from previous generations (Sanchez, 2018). As a result, they have extensive technical knowledge and the capacity to quickly access large quantities of information (Sanchez, 2018). Millennials consume a lot of media, communication technologies, online social networking platforms, video games and other communication channels (Lenhart et al., 2010). Accordingly, millennials are drawn to a wide range of platforms; they often use blogs and social networks (Hershatter and Epstein, 2010). They rely more on the views of their peers when making purchasing decisions than other generations do (Valentine and Powers, 2013). Similarly, millennials spend a significant amount of time in virtual worlds, where they not only enjoy interactions in social networks, but also share their insights and connect and engage with one another (Noble et al., 2009).

There are several reasons underlying millennials' and Generation X's technology behaviour. Firstly, Generation X refers to people born between 1965 and 1980, and they are one of the most educated generations; they are characterised by cynicism, pragmatism and a risk-averse mentality (Gurau, 2012). This generation was not used to the internet and new technology during their childhood; however, they quickly integrated technology into their everyday adult lives (Calvo-Porral and Pesqueira-Sanchez, 2019). Moreover, during the transition to emerging technology, individuals who are Generation X developed a preference for email and texting over phone or face-to-face contact, and have high rates of internet adoption (Calvo-Porral and Pesqueira-Sanchez, 2019).

On the other hand, it is claimed that millennials' technological behaviour mainly starts with the entertainment motive. More specifically, the findings of Calvo-Porral and Pesqueira-Sanchez (2019) indicated that television is the primary motivator that affects millennials' technological intention and behaviour. As a result, millennials can use and be cognitively involved and completely absorbed in their relationship with technology or motivated by hedonic inspiration.

In general, millennials are heavily influenced by hedonic motivations while using technology, whereas Generation X's use of technology is more based on its practical use. This leads to a conclusion that millennials and Generation X have distinct motivations to use and interact with technology. One potential reason for the disparities in motives is that these individuals belong to a different generational group that affects their beliefs, attitudes and behaviours. This conclusion aligns with the findings of Charles and Kasilingam (2013) and Malmendier and Nagel (2016) as age plays an important role in shaping one's behaviour, not only technological behaviour, but also investing behaviour, which is affected by experiences of inflation. Demographic factors are the most used element to address problems related to individuals' behaviour in studies of the evolvement of technology and finance. For example, while making an investment, investors are normally influenced by hindered biases factors that connected to their demography. In particular, the economic conditions that one has experienced in the past can have a long-term effect on one's investment decisions and expectations of results (Malmendier and Nagel, 2016). Therefore, the author would like to further focus on millennials' behaviour and perceptions of Fintech.

### 2.4.2. MILLENNIALS AND FINTECH ADOPTION

Fintech is the convergence between finance and technology. Technological advances have always imposed effects on the financial market and transformed the operations of the financial sector. The scope of operation in Fintech began with mobile payments, money transfer, P2P lending, crowdfunding and has expanded to blockchain, cryptocurrencies, robo-investing and insurance.

According to Nugroho and Novitasari (2023) and Lee Kou Chuen and Teo (2015), Fintech is defined as products or services in financial service companies that are based on highly advanced and disruptive service technologies. Fintech has previously evolved on the pledge of increasing access to the financial sector by delivering services to underbanked or unbanked communities. However, the faster, cheaper and better service models delivered by Fintech start-ups are gradually undermining the incumbent banking sector.

According to Chang et al. (2016), millennials are found to be the main Fintech consumers and adopters, which is a critical aspect that drives the business strategies of Fintech companies and the banking system. This reflects the fact that millennials are more familiar with digital products than other generations. In addition, the socio-economic chaos in 2008 that millennials encountered had a strong influence on their decision for Fintech products over traditional banks' products. Furthermore, as opposed to other generations, their ability to exchange personal data with service providers in order to get personalised services plays a critical role in their preference for Fintech services (Singh et al., 2020; Daquar et al., 2020). According to a new poll in the US (Shashwat et al., 2020), nearly half of millennials believe their credit score is holding them down. Younger individuals have a shorter credit history and, as a result, are often refused credit by conventional financial institutions or have to pay prohibitively high interest rates, which limits their access to credit. This, in particular, complicates the assessment of their creditworthiness by restricting their ability to build a credit background. Many of these people could be "healthy borrowers" if their creditworthiness could be assessed using alternative statistics. The issue of millennials' lack of credit history is a global one, especially in developed countries. This prompted the need for alternative evidence for credit scoring for millennials.

Besides millennials, Generation Z is also recognised as Fintech adopters (Mohannad et al., 2020). Mohannad et al. (2020) revealed that all generations have a high intention level to use Fintech services, however, millennials had a higher level of intention compared to Generation Z. They also pointed out that millennials demonstrated a greater level of experience and knowledge of Fintech services and applications.

Some of the most active areas of Fintech innovations revolve around the following areas: blockchain technology, cryptocurrency, smart contracts, insurtech, unbanked or underbanked services that seek to serve disadvantaged or low-income individuals who are underserved by traditional banks, and cybersecurity. Among these active areas of Fintech, cryptocurrency has gained popularity across financial institutions in general and individuals like millennials in particular. Therefore, the author would like to focus on studying cryptocurrency investment, as well as millennials' adoption of cryptocurrency, to gain specific knowledge about the financial

behaviour of millennial investors. Section 2.5. investigates the determinants that influence investors' decisions in the stock market and the cryptocurrency market.

## 2.5. DETERMINANTS THAT INFLUENCE INVESTMENT STRATEGY

### 2.5.1. DETERMINANTS THAT INFLUENCE INVESTORS' DECISIONS IN THE STOCK MARKET

Demirel et al. (2011) examined how demographic and financial behavioural variables influence investment decisions. The research was undertaken to assess the effect of demographic influences on individual investor behaviour. They reported that gender correlates with five financial behavioural factors – overreaction, herding, cognitive bias, irrational thought and overconfidence, whereas personal savings had a relationship with only four of the financial behavioural factors – overreaction, herding, cognitive bias, and irrational thinking. Moreover, Demirel et al.'s (2011) findings were confirmed by Rekik's (2013) research. Rekik (2013) found that Tunisian investors do not always make sound investment decisions. The study concluded that herding behaviour, representativeness, anchoring, loss aversion and mental accounting all affect Tunisian investors' perceptions of their decision-making processes, but there is no overconfidence bias in the Tunisian Stock Exchange. Tunisian investors seem to be underconfident, tentative and overly receptive to the reactions and views of others. Rekik (2013) also found that demographic variables (gender, age, socio-professional group and experience) and financial behavioural factors both seemed to have an effect on the actions of Tunisian market investors; that is, people of a certain age are less susceptible to behavioural prejudices when they gain expertise, while elder investors who are less educated and have smaller earnings are more susceptible to behavioural biases.

Fares and Khamis (2011) used a multiple regression approach to analyse individual investors' stock trading activity at the Amman Stock Exchange in Jordan. They found four behavioural variables (age, education, internet access, and contact between the investor and his or her broker) that affected investors' trading decisions. According to Fares and Khamis (2011), factors related to investors' age, education and internet access had a significant and positive impact on stock trading,

whereas contact between the investor and his/her broker had a strongly significant and negative effect. Additionally, Geetha and Ramesh (2012) concluded that demographic factors have a major impact on some investment decisions among Indian investors in the stock market.

Nonetheless, economic influence is considered to have a significant effect on investors' behaviour in the stock market. Azam and Kumar (2011) studied the factors affecting Pakistani investors' actions on the Karachi Stock Exchange and discovered that earnings per share, foreign direct investment and GDP growth rate had a major effect on stock prices. Obamuyi (2013) shared similar results and reported that the most significant primary considerations that affect investment decisions are the company's stock's past results, expected stock split, capital increases, bonus, dividend strategy, expected corporate profits and "get-rich-quick" schemes. Other demographic factors, such as gender, age, marital status and educational qualification, of investors in the Nigerian capital market also had a substantial impact on stock market decisions. Specifically, investors' investment decisions about the past success of a company's stock varied depending on their socio-economic characteristics (age, gender, marital status and educational qualification).

On the other hand, research by Suman and Warne (2012) showed that respondents combined the goals of saving, the reasons driving saving and the sources of knowledge for decision making. The respondents placed a premium on annual income and annual savings since the amount of income determines the level of savings. Investors are well versed in the stock market. Price fluctuations also have an effect on stock market owners' investment patterns.

Furthermore, the investment decision process is considered crucial for any investor, particularly when investing in equities that entail high risk and uncertain returns. Therefore, Pardhasaradhi and Sultana (2012) investigated the decisions of investors in India based on numerous factors as well as the frequency of an investor's highly valuable ranking. They reported that individual eccentric, wealth maximisation, risk minimisation, brand perception, social responsibility, financial expectation, accounting facts, government and media, economic expectation, and advocate advice were the major factors that strongly influence the decisions of investors in the stock market (Pardhasaradhi and Sultana, 2012).

Aregbeyen and Mbadiugha (2011) showed that motivation and personal goals are incentives for investors to choose to invest in the stock market. They stated that the five most influential factors on investors' decisions, in order of importance, are: motivation by people who have attained financial security by share investment, future financial security, recommendations by reputable and trusted stockbrokers, management team of the company, and knowledge of the prospects of investing in shares.

In term of risk-taking ability, demographic factors, such as age and gender, are the primary variables (Kabra et al., 2010). People who are risk averse, for example, opt for life insurance plans, and fixed deposits with banks and post offices. Kabra et al. (2010) pointed out that blind investments are rare, since the vast majority of investors rely on certain source and comparison groups to make decisions. Moreover, investment decisions are influenced by expected behaviour and risk propensity; Alleyne and Broome (2011) proved that the principle of expected behaviour is a good indicator of investment intentions. Furthermore, their results indicated that behaviours and referent classes (peers, families and significant others), as well as opinions about future challenges and opportunities, substantially predict investment intentions. Likewise, Stambaugh and Yuan (2017) found an asymmetric impact of emotions on markets with overpricing triggered by strong sentiments, which suggested that underpricing is caused by weak sentiments.

Nevertheless, during the spread of COVID-19, investors' behaviour in the stock market might have changed due to economic concerns and personal issues. Riaz et al. (2020) identified which factors might influence stock market investors' activity in Pakistan during the pandemic. Data were gathered from a variety of individual investors, with a high response rate from 167 respondents. According to their study, the most important and significantly influencing determinants on investment decisions in Pakistan stock markets are getting rich quickly, loss aversion, fear of losses, expected corporate earnings and dividends, gut feelings on the economy, previous performances of firm's stock and opinions of its majority shareholders and, finally, a recommendation of certain stocks (Riaz et al., 2020). The results signified that individual investors in the Pakistan stock market are secure in their ability to use their experience and expertise in sensitive situations in order to achieve a more successful result from their investments. Overconfidence offers an

invaluable boost for investors during unpredictable times; it enables them to complete unforeseen and challenging tasks and assists in trend forecasting. Overconfident traders overestimate the uncertainties associated with successful stock investments, which results in sustained losses. They are encouraged to use their overconfidence wisely, with manageable, smart and appropriate intelligence. Individual investors must choose competent advisors due to a lack of knowledge, as their advice and assistance will limit losses and improve prospects for better profitable returns on their investments. Riaz et al. (2020) were optimistic that their analysis would provide practical help to private investors, investment managers and policymakers.

Also, in a report on investor sentiment in the equity financial market, AlMansour (2015) claimed that the majority of people may overreact to overdramatic and unpredictable news or events, which results in prices diverging from their primary values. When there is continuity in the pattern of reporting, such as multiple optimistic developments over a period of time, investors prefer to perceive these events as agents of market movement in the future.

In a nutshell, it is clearly noticeable that the determinants that influence investors' decisions in the stock market or in stock investment are mainly based on four categories: demographic factors; psychological factors including attitude, perceptions related to stock market and risk-bearing capacity; economic factors; and social influence factors combining peers, family or news. These factors can be applied in various areas when studying investors' behaviour in the stock market for example; however, to test whether these categories can be applied to cryptocurrency investment, the author will examine previous research about investment decisions in the cryptocurrency market in the next section.

### 2.5.2. DETERMINANTS THAT INFLUENCE INVESTORS' DECISIONS IN THE CRYPTOCURRENCY MARKET

Only a few surveys have been done in the field of cryptocurrency, which is a comparatively recent investment asset, to explore investors' perceptions of cryptocurrencies. Henry et al. (2017), in

particular, examined Bitcoin understanding and use in Canada. They polled a representative sample in Canada using the Bitcoin Omnibus Survey. According to the results, more than half of Canadians are aware of Bitcoin, but only a small portion of them use it successfully. Furthermore, the results revealed that men and those with a college or university education were significantly more likely to be aware of Bitcoin. Furthermore, unemployed people were the ones who were most positive about Bitcoin. Bitcoin possession, on the other hand, was aligned with younger age groups with a high school education. Finally, the findings revealed that awareness is strongly linked to Bitcoin acceptance.

In the retail market, the desire to use blockchain payments in the near future is significant; however, the use of Bitcoin by retailers is still restricted (Jonker, 2018). By investigating the adoption intention and actual usage of Bitcoin retailers in the Netherlands, Jonker (2018) showed that the effects of customer acceptance of crypto payments, the retailers' perceptions of the net transaction benefits associated with crypto payments, and the retailers' perceptions of the extent of adoption efforts are all factors driving retailers' readiness to accept Bitcoin payments. Other variables, on the other hand, have been discovered to hinder retailers' use of cryptocurrencies, such as poor market appetite and the perceived reduced added utility to cryptocurrency payments in contrast to other conventional payment types.

In the case of studying cryptocurrency investors in Thailand, Tangwattanarat (2017) used qualitative method to conduct 25 in-depth interviews. Tangwattanarat (2017)’s findings show cryptocurrency investors have high risk tolerance in which they are short-term traders with bullish characteristics. It is emphasised that short-term traders on cryptocurrency market expect to gain returns in a short period ranging between minutes to months. Alonging with this, Thai cryptocurrency investors favour market volatility. This suggests Thai cryptocurrency investors’ expectations of gaining substantial returns are notably high. Hence, money incentive could be considered as one determinant influence cryptocurrency investors.

In addition, Tangwattanarat (2017) assess psychological aspects of cryptocurrency investors with the use of behavioural economic. “Belief and optimism”, “confirmatory bias”, “overconfidence” and “herding effect” are captured from Thai cryptocurrency investors’ behaviour patterns in cryptocurrency market (Tangwattanarat, 2017; page 22). They, also, refer to friends or social

media as reference for their investing decision. This behaviour is noteworthy, particularly due to the fact that whitepaper is regarded as more reliable source, yet it is rarely taken into consideration.

Furthermore, Echchabi et al. (2021) applied TPB to explore the factors that could affect Moroccan investors' intentions to invest in cryptocurrencies. According to their results, attitude, subjective norms (SN) and perceived behavioural control (PBC) will affect Moroccan investors' decision to invest in cryptocurrencies. Additionally, it was recorded that Moroccan investors demonstrated a strong proclivity to invest in cryptocurrencies.

In reference to cryptocurrency transactions, Khairuddin et al. (2016) interviewed nine Bitcoin consumers to investigate their reasons for buying cryptocurrency. They reported three key motivations driving Bitcoin usage: projected position in a foreseeable monetary transition, consumer control, and understanding of Bitcoin's actual worth; these findings seem to deliver a fair conclusion, but the accuracy of the result is called into doubt because of the study's lack of rigor. Given the sample size, technique and outcome interpretation process, Khairuddin et al.'s (2016) study cannot say that the results would hold as well if the sample size and methodology were changed.

Kazerani et al. (2017) expanded Khairuddin et al.'s (2016) study by including an observational trial that examined Bitcoin users' reactions to the modern cryptocurrency consumers view app interface and how this impacts confidence and risk in using this app. Kazerani et al. (2017) demonstrated that users' financial literacy and the usability of the product made a significant contribution to users' experience of using cryptocurrency app. However, future iterations of this study should not only continue to focus on novice or infrequent Bitcoin users, but also focus on a broader range of participants, including those of varying age, technical background and financial literacy. This will increase the likelihood of gaining a deeper understanding of the relationship between financial and technical literacy and the utilisation of Bitcoin services.

Likewise, the number of research papers on the adoption and acceptance of cryptocurrency is scarce; however, there have been attempts to utilise existing technology adoption and acceptance theories as well as models to evaluate users' intention to adopt cryptocurrency. Researchers have

applied models such as diffusion of innovation theory (DoIT), TPB, TAM and UTAUT1 and UTAUT2 to absorb distinctive features of cryptocurrency adoption. DoIT was adopted by Presthus and O'Malley (2017) to examine users' motivations and barriers to cryptocurrency adoption. The researchers claimed that technological curiosity is the major motivator of Bitcoin adoption. They also identified the value and security problems as fundamental concerns from a non-user's perspective.

Folkinshteyn and Lennon (2017) utilised the modified TAM developed by Pavlou (2003) to analyse Bitcoin as a currency and blockchain as a Fintech from the user's and developer's perspectives. They used the modified TAM to assess the perceived ease of use, perceived usefulness (PU), and perceived risk and trust factors from the user's perspective of Bitcoin. Perceived risks included factors such as security risk, user error, loss of privacy and third-party service failure. The perceived ease of use construct included fast transfer, free participation and simple interface. Lastly, PU included full control over own money, low cost of transfer, disintermediation, transaction security and international scope.

The nature and distinctive characteristics of cryptocurrency pose the challenging task of developing models that provide a better understanding of cryptocurrency adoption. Silinskyte (2014) used the UTAUT model developed by Venkatesh et al. (2003) to understand the user's usage behaviour towards Bitcoin. Silinskyte (2014) found that performance expectancy, effort expectancy, facilitating conditions and behavioural intention significantly influenced the usage of Bitcoin. However, UTAUT is claimed to be inefficient at examining Bitcoin adoption.

In section 2.5, determinants that influence investment strategy and decision in both stock and cryptocurrency markets were mainly demographic, financial literacy, attitude and awareness of both investing channels (Kazerani et al., 2017; Khairuddin et al., 2016; Echchabi et al., 2021; Kabra et al., 2010; Fares and Khamis, 2011; Demirel et al., 2011). An expansion of attitude research, thus, is conducted in the section 2.6.

## 2.6. WHAT IS ATTITUDE AND PERCEPTION?

Attitude has been part of social psychology since Thomas and Znaniecki (1918–1920) published The Polish Peasant in Europe and America. The term "attitude" was originally used by Jung (1923) in his writing on psychological styles to characterise the readiness to react; this concept was later incorporated by Allport (1935). Attitude is believed to own an opinion about a target, which can be an object, a person or an abstract idea. Attitude is also related to other disciplines such as political behaviour (attitudes towards political candidates, parties, voting), health (attitudes towards protective behaviours, new medications or the health system) or attitudes towards advertisements or certain products in marketing. In particular, the attitudes between people are researched in the field of interpersonal liking, attitudes toward the self in the field of self-esteem and in abstract ideas.

In the current social psychological sense, attitudes are characterised as the predisposition to react in a favourable or unfavourable manner to the object of the attitude (Ajzen, 1982; Rosenberg and Hovland, 1960). Furthermore, the reference to individuals' attitudes is closely related to how their behaviour is interpreted. "Personality, beliefs, values, behaviours and motivations" are the mixture of different components in one's attitude (Pickens, 2005; page 44). Owing to this, the precision of the attitude must match to the specificity of the measurement (Ajzen, 1982; Ajzen and Fishbein, 1977; Ajzen and Madden, 1986). Additionally, matching the specificity of the attitude with the specificity of measurement serves a dual purpose. First, it raises the precision of the calculation within the particular class, and second, because of this improved precision, it strengthens the consistency of the instrument. By studying one's attitude, it unfolds the way one sees a certain situation and signalling the outcome of behaviour about that particular situation (Pickens, 2005).

According to Pickens (2005), there exists a close relation between perception and attitudes. Perception is defined as a cognitive process of deciphering "organisms" together with the formation of "sensation" toward an experience (Lindsay and Norman, 1977). In essence, individuals evaluate a situation according to their past experiences and transforming them into perceptions (Pickens, 2005). It is stated in Pickens (2005)'s research that "stimulation, registration,

organisation and interpretation" are the major stages in forming a perception (Pickens, 2005; page 54). Wherein individuals' awareness and reception of a certain situation has a significant role in this forming process. Similar to attitude, perception also undergoes the limitation of one's personal experience, motive, interest, beliefs and characteristics (Assael, 1995 as cited in Pickens, 2005). Furthermore, perception is enhanced as the posterior value of something experienced.

Hoffman et al. (2015) claimed that perception is the product of evolution and an adaptive interface. Likewise, attitudes evolve over time and contexts through interactive processes with the environment (Abelson, 1982; Chaiken and Stangor, 1987). The degree of change for both attitude and perception can vary based on how deep-seated or essential the person's personality is. Therefore, the development of one's perception and attitude toward an issue has shared similar aspects and factors. Moreover, to understand the root of someone's behaviour, looking at attitude will provide a well-rounded idea as attitude encompasses first-hand experience, one's perception that formed from the experience with his or her evaluation of a situation.

To study an individual's attitude and perception, a number of research has applied Theory of Planned Behaviour by Ajzen (1991), Theory of Reasoned Action by Ajzen and Fishbein (1975), Technology Acceptance Model by Davis (1989). Sitorus et al. (2020) applied Theory of Planned Behaviour to investigate which determinants have an influence on millennials' intention to invest in peer-to-peer lending. The scholar mentioned that millennials' perception in risk management, social influence and attitude drove their intention to invest. As well as learning about millennials' perception in luxury fashion wearable technology, Blazquez et al. (2020) identified that perceived usefulness or benefits, rewards are the most significant factors and followed by social factors. In Blazquez et al. (2020)'s study, Theory of Planned Behaviour and Technology Acceptance Model were adopted to research millennials' perception. Moreover, having awareness about a specific object boost one's confidence in taking action and increasing one's level of perceived behaviour control. For instance, individuals with high level of financial awareness and knowledge were proven to have higher intention to adopt Fintech (Pertiwi and Purwanto, 2021; Rachmawati et al., 2021). This was achieved from the application of Theory of Planned Behaviour and Theory of Reasoned Action to study individuals' attitude and behaviour.

In the section below, the author will evaluate factors that influence attitude and perception. Examples from previous studies will be presented with an aim to navigate which determinants play an important role in shaping one's attitude and perception towards a stimuli.

### 2.6.1. FACTORS AFFECTING ATTITUDE AND PERCEPTION

An individual's attitude forms a framework of thinking such that the individual likes or dislikes an object and at the same time accepts or shuns it. Attitude makes people behave in a consistent way with similar objects. Because attitudes exist in the form of thinking, it is very difficult to change them; changing a particular attitude may require the influence of many different parts of the attitude. Not to mention, the forming of one's attitude and his or her behaviour are aroused from their perceptions (Mullins, 2013). Because of this connection, it is demonstrated that factors influence attitude may have an impact on perception towards conducting an action. Moreover, the background model of attitudes towards investment includes influencing factors such as awareness, personal experience and social influence. Likewise, perception shares similar factors in experiencing a stimuli that rise from personal past experience, interest, beliefs and interaction with the outer world.

Therefore, in the paragraphs below, the author would like to illustrate how the factors relates to attitude and perception towards investment with the aim to identify an applicable conceptual framework for the objectives of this study.

#### 2.6.1.1. AWARENESS

Investors typically tolerate the loss of certain current values in exchange for an unknown potential payoff while engaging in an investment operation. This may include making various choices from the kind of instruments to invest in, whether to combine instruments, the amount of investment to make, scheduling considerations and so on. Normative finance theory assumes that investors' investment decisions must be fair, whereas behavioural finance assumes that investors

fundamentally deviate from rational decision making (Sewwandi, 2015). According to Ammer and Aldhyani (2022), variables such as awareness, income level and expertise play a major role in influencing the young generation to invest in particular financial instruments.

Financial awareness also requires experience of financial markets, different financial services, and financial goods, which can be used to prepare and budget for both personal and professional finances (Dewi et al., 2020). In cryptocurrency, blockchain and cryptocurrency awareness have recently increased geometrically, but in distinctive ways according to the users' perspectives. Most cryptocurrency users have paved the way for the establishment of small and medium-sized businesses after gaining high returns from the cryptocurrency market. These users have mainly been in the field for a few years and have experience in investing in other financial markets. The others invest because of curiosity in the technology or to diversify their portfolios or to gamble. The differences among users may be related to their awareness of cryptocurrency. However, cryptocurrency awareness among users or participants is still in its infancy, particularly in developing countries. The stability of cryptocurrency investment or lack of adequate knowledge of cryptocurrency handling or government policies have been described as impediments to cryptocurrency adoption. Ku-mahamud et al. (2019) described the level of awareness of cryptocurrency, blockchain technology and Fintech, in general, as intermediate.

Doblas (2019) regarded attitude and awareness as antecedents to understand adoption of cryptocurrency among individuals. Doblas's (2019) objective was to ascertain the degree of awareness and attitude of college students towards cryptocurrency, as well as how these may result in an eventual decision to adopt. Doblas used a descriptive research design and created a questionnaire as the research instrument. Logistics regression was used to determine how cryptocurrency awareness and attitude lead to adoption. The study's findings revealed that attitude is a major factor in explaining potential acceptance, while awareness is only significant at the lower level of significance (Doblas, 2019).

In other financial areas, such as the banking industry, an individual's awareness was proved to have a significant influence on attitude. Kaakeh et al. (2018) claimed that customers' awareness of

Islamic banking principles and mechanisms had a strong impact on their approach to Islamic banks. Moreover, they showed that lack of knowledge of Islamic banking systems and contracts had negative effects on attitudes. These findings are related to the studies of Ahmad and Haron (2002) and Awan and Azhar (2014), which indicated that consumers who took the view that these banks are not Shariah compliant based their view on the minimum amount of information they had about them, which influenced their attitude towards Islamic banks.

In other fields, awareness also has significant effects on attitudes. Lu et al. (2014) proved that brand awareness affects consumers' attitudes towards sponsored recommendation posts. In particular, when consumers' brand awareness of a recommended product in a blog post is high, their attitude towards the sponsored recommendation is more positive than when their brand awareness of the product in the blog post is low. These results were confirmed by Laroche et al. (1996) who showed that customer confidence and trust in brands will improve if brand awareness is high. Consumers will also be more likely to trust a post's statements if they have a high level of brand awareness.

Awareness has an impact on one's perception towards certain phenomena, issues and events. This was proven through the work of Padmaja (2013) , Parashar and Rasiwala (2018), Rana (2019) and Sumathy and Jisha (2022). In Padmaja (2013) and Mohan and Tp (2022)'s study, the lack of information about mutual funds limits investors' understanding and interpretation of it that affect investors' perception. As a result, it is found that investors favoured gold and fixed deposits as a long-term investment than mutual funds. When there is insufficient information about mutual funds to feed investors' awareness, a hesitation in taking action appears. Put simply, investors were not fully aware of the benefits of mutual funds, and it was affecting their perceptions toward mutual funds investment.

In decision making process, investors would value awareness, environment, exposure, intentions, beliefs (Rana, 2019). Moreover, investment decision making combines with investors' perception about the investing instruments as well as the risk associated with it. In particular, Rana (2019)

researched Nepalese stock market through 204 investors and found that investors' awareness is positively correlated with risk perception and their behaviours. Under the lens of cryptocurrency, Parashar and Rasiwala (2018) showed that Bitcoin price is strongly influenced by the public awareness and a positive increase in the level of public perception in Bitcoin future. This suggests the belief among cryptocurrency users or investors, which emerged from their awareness and perception, has fuelled their participants in cryptocurrency market.

#### 2.6.1.2. PERSONAL EXPERIENCE

Jhamb et al. (2020) studied consumption of luxury brands in India. They stated that a customer's attitude to a brand is determined by their experience of the brand, which is referred to as post-purchase behaviour. Customer experience, behavioural experience, sensory experience and intellectual experience have a significant correlation with a consumer's attitude in consumption. Behavioural experience refers to physical encounters, lifestyles and consumers' relationships with the brand; while sensory experience encompasses the enhancement of a consumer's senses (vision, scent, taste, touch, and olfactory stimulation) provided by a specific product or brand. Intellectual experience involves both convergent/analytical and divergent/imaginative reasoning, which assists users in reproducing the various facets of the brand in a variety of ways. Jhamb et al. (2020) demonstrated that a favourable intellectual experience has a positive effect on a consumer's affections towards the brand. They also suggested that as a consumer's intellectual experience develops, there is a positive shift in their attitude towards the brand. Aside from this observation, their structural model findings showed that behavioural experience is an important and positive indicator of behaviour-related attitude (Jhamb et al., 2020). However, their findings also showed that behavioural experience is not a major indicator of a consumer's affective-related attitude. Nonetheless, they found that when a consumer's affective experience increases, there is a positive difference in the consumer's behavioural attitude (Jhamb et al., 2020). To conclude, their results suggest that in order to improve one's affective attitude, one must first change one's affective experience. Interestingly, the standardised coefficient findings showed that a consumer's affective experience yielded higher standardised figures than visual, intellectual and behavioural experiences (Jhamb et al., 2020). According to the study's conclusions, when a customer has a favourable experience with a luxury brand, it has a positive impact on the consumer's attitude

towards that brand (Dolbec and Chebat, 2013; Khan and Fatma, 2017). Sensory, intellectual, physiological and affective aspects are important components of customers' experience with luxury brands (Brakus et al., 2009; Wiedmann et al., 2013; Kim et al., 2015). Based on these results, it can be concluded that end users' thoughts and experiences play an important role in shaping a favourable attitude towards luxury brands (Hulten, 2011; Cho et al., 2015; Jhamb et al., 2020).

Jusoh and Ling (2012) examined consumers' attitudes towards e-commerce purchases in online shopping. Using the Pearson's test, they investigated how trends of online sales (types of products, e-commerce experience and hours of internet use) affect customers' attitudes towards online shopping. Their results showed a substantial correlation between e-commerce experiences and attitudes towards online shopping among respondents.

In the case of perception, personal experience has an impact on one's perception towards a situation. During the examination of investors' awareness in equity market, Bhuyan et al. (2021) found that past investment experience is correlated with investors' risk perceptions and awareness. The correlation is tested on primary data, which has not only indicated the strong connection between risk perception and past experience, but also highlighted its effects on investors' behaviour in equity market.

Moreover, the relationship between past experience and perception is mentioned in Linden (2014), Aru et al. (2016) and Ohman (2017). Notably, an individual's perception regarding a stimuli determined by prior experience could have an ability in influencing others' perceptions publicly (Linden, 2014). Considering the case of Linden (2014), one's emotional and cognitive process about climate change has strong impact on a wide spectrum. For example, a person's prior experience with inclement weather is a significant predictor for risk perception in climate change. Sharing the same school of thoughts, Ohman (2017) stated that the perceived risk level is impacted by one's experiences about crisis, for example, accidents or catastrophe. Moreover, not only general past experience has the power to shape one's perception, but it also depends on the categories of experience possess human's perception towards risk. Additionally, past experience

of enhancing knowledge or information related to a topic can help with evaluating perceived benefits and risks. This finding was derived from Aru et al. (2016) study about how prior experience impacts human's conscious perception. It is, likewise, mentioned in Snyder et al. (2015)'s paper that past experience can alter sensory systems to enhance one's perception about a forthcoming situation as recorded in Bayesian models (Snyder et al., 2015).

#### 2.6.1.3. SOCIAL INFLUENCE

Based on the paradigm of social influence, Ali et al. (2013) stated that an individual's attitudes towards the tax system are considered to be influenced by the behaviour and social norms of the individual's comparison community. It is fair to think that human behaviour in the field of taxation is affected by social relations in the same manner as other types of behaviour. Compliance behaviour towards the tax system may be influenced by the actions of the comparison group of individuals, such as families, neighbours and associates. Therefore, if a taxpayer encounters more individuals in communities who are significant to him or her who avoid taxation, then his or her compliance would be lower. On the other hand, social relations also serve to dissuade people from participating in evasion because of the fear of the social penalties that would be enforced if their evasion was identified and made public. Theoretical research on herd behaviour in economic contexts (Banerjee, 1992; Cipriani and Guarino, 2014) also suggests that social factors can affect enforcement, in particular by influencing the perceived likelihood of identification. One of the most consistent observations regarding the perceptions and behaviour of taxpayers in Western countries is that those reporting compliance conclude that their colleagues (and taxpayers in general) comply, whereas those reporting cheating claim that others are cheating (Yankelovich et al., 1984). Evidence indicates that expectations of the integrity of others can influence enforcement behaviour.

In the context of social media, Iyengar et al. (2009) investigated the effects of peers on consumer transactions. Data from Cyworld in South Korea revealed conflicting findings about social media's impact on consumers. Friends' buying behaviour had a substantial and positive effect on "moderately connected" users, but "highly connected" users showed a detrimental influence, that

is, they dropped their purchase intention when they saw their friends purchasing goods via social media. Wais and Clemons (2008) found that respondents who received promotional messaging (advertisements) from another individual, rather than a business, were likely to view such promotional messaging more positively.

In Akhatar et al. (2018) 's research, social influence was utilised to test the role of one's personal character in discerning their perceived performance of an investment. Akhatar et al. (2018) indicated that social influence serves a positive effect for individuals high in extraversion when it comes to perceive performance of an investment. On the other hand, social influence has a diminishing effect for investors who high in agreeableness in perceived performance investment (Akhatar et al., 2018). Hence, social influence bears a duo-effect on investors' perceptions and affects them differently based on their characters.

A research on factors determine Indian stock investors in decision-making process has found that social influence – social media – has no effect on investors' risk perception (Chaitanya and Nordin (2021) . The application of Behavioural Economic theory and Cultivation theory has unfolded the connection of psychological determinants (i.e. anger, stress), risk perception and social media. Investors' emotions have no relation to social media, despite the claim that there is a significant correlation between two aspects in investment decision-making (Chaitanya and Nordin, 2021). Moreover, stock market has lower risk comparing to cryptocurrency market. Hence, referring to social media as a source of information may have minor impact on the process of perceiving risk. On the contrary, Hasib (2020) found that social influence has positive relationship with perceived investment performance. This result arose from 277 investors, in which, not only social influence has a direct relationship with investors' perception, but it also has an indirect impact on the connection of investors' personality and the level of perceived investment performance.

As anticipated, social influence has a significant effect on one's perception about cryptocurrency investment. This was proven from Safdar et al. (2023) as the scholars researching the roles of social influence and other behaviour factors in cryptocurrency market that is located in developing

countries. With the use of Venkatesh et al. (2003), social influence was found to be the most significant factor that influence cryptocurrency investors' perception (Safdar et al., 2023).

### 2.6.2. INVESTMENT ATTITUDE

Financial investment intentions originate from the individual's attitude to financial risk, which, in essence, is primarily determined by the individual's personality. A plethora of research has been undertaken using psychographs to determine the effect of the personality profile of individuals on their investment decisions, but very few studies have been conducted that examine the role of attitude as a mediator between personality type and investment intentions. According to Xiao et al. (2011), human behaviour is rather dynamic and the financial component of human behaviour is convoluted. An individual's financial behaviour relies on a wide range of personal and environmental factors. These factors can be divided into two categories, namely market factors and behaviour factors.

In terms of market factors, individuals cannot fully influence market factors because they comprise inflation, interest rate, financial services and current market activities; they can only shield themselves from harsh changes in certain external elements (Xiao et al., 2011).

Behaviour factors refer to an individual's attitude towards investment and financial risk. These factors vary from person to person due to age, job, financial expenditure and their understanding about finance. It is also claimed that these personal factors have an effect on the emotions of investors, which might have an impact on their financial decision making (Hira, 2012). Moreover, individuals use objective assessments to create an investment attitude that influences their financial decisions and actions (Grable et al., 2004). This logical interpretation of attitudes towards financial risk assumes that individuals prefer the rule of logic. However, individuals may not always be logical and, equally, their choices may not always be ideal. According to Kahneman and Tversky (1979), financial decision making does not necessarily obey the assumptions of logical decision making (Pellinen et al., 2011).

Every investor has different personal circumstances and expectations, and thus different attitudes towards financial risk and financial objectives (Sadiq and Khan, 2018). Dash (2010) and Geetha and Ramesh (2012) predicted investors' investment decisions (e.g., securities, shares, real estate) based on lifestyle and demographic characteristics.

In the context of savings as an investment in developing countries, such as Pakistan, working women have a positive attitude towards this investment because of their independent earning power (Bhabha et al., 2014). Bhabha et al. (2014) demonstrated that employed women are motivated by the investment behaviour of their co-workers. Likewise, employed women's increased level of financial knowledge and awareness motivates them to slowly participate in investing activities. Besides, income, financial security and return on investment are proved to be factors affecting their attitude towards investment.

Furthermore, Shanmugam (1990) pointed out that investment goals and the level of financial understanding influenced investors' attitude and investment decisions. Their study derived results from a sample of 90 investors to analyse the factors impacting investment decisions. They showed that Indian investors who had sufficient understanding of government legislation and policies were high-risk investors.

Nevertheless, the financial behaviour of a person can be measured on the basis of financial management techniques (Xiao, 2008). To achieve ultimate financial well-being, investors are expected to satisfy all their needs, both in the short and long term, which requires good financial planning and investment intentions.

In general, attitude to investment varies based on demographic factors, income, education and knowledge about finance. However, these elements might not be the same across different generations due to the living environment and the development of technology. Therefore, in section 2.6.3, the author will specifically study millennials' perceptions of investment.

### 2.6.3. MILLENNIALS' ATTITUDE TO INVESTMENT

Financial knowledge is considered to be a crucial factor that influences millennials' attitude towards investment. The more knowledgeable millennials are about finance, the more positive their attitude towards investment. The results of Sabri (2016) suggested that millennials who are financially literate about the disparity between stock and mutual funds are more likely to take risks in their investment decision making compared to those who are only financially literate about mutual funds. These results are consistent with Van Rooij et al.'s (2011), Almenberg and Dreber's (2015) and Akhtar and Das's (2019) findings that an individual who is less literate about the stock market is less likely to invest in the stock market. Accordingly, Cuandra (2020) showed that millennials' attitude towards investment is influenced by their financial knowledge and their investor personality trait. For millennials who are knowledgeable, risks are not considered to be a major problem, however, millennial investors prefer a safe investment. To support this, Mahardhika and Zakiyah (2020) conducted a hypothesis test and reported that they could not prove that risk avoidance influences millennial investors' intention to invest in stock.

Nevertheless, Setyorini and Indriasari (2020) claimed that attitude does not impact millennials' interest in investment. The explanation is that the millennial generation has understood the value of investing but has not been able to implement the investment mechanism, perhaps because of the constraints they face. However, millennials still have faith in the value of investment. This contradicts the findings of Partridge and Ho (2003) who showed that one's attitude affects one's decision to invest. Alleyne and Broome (2011), Adam and Shauki (2014), Pascual-Ezama et al. (2014), Mahastanti and Hariady (2014), Sondari and Rahmat (2015) and Khoa Cuong and Jian (2014) argued that actions will affect one's intention to invest. Gopi and Ramayah (2007) and Schmidt (2010) suggested that attitudes have a positive effect on investment intentions, which explains that the stronger the positive attitude of someone to invest, the greater the intention of someone to invest.

Interestingly, some millennials are sceptical about investing in stock markets and they tend to spend money on their needs. Millennials who are approaching adulthood are considered to be financially risk averse and cautious buyers who, more often than past generations, keep their investments in cash and less in stocks (Debevec et al., 2013; Brown, 2018; Sharf, 2014). The

underlying reason could be due to the financial crisis of 2008 and market instability, which have led to a state of general mistrust of financial institutions, particularly among millennials (Martin, 2018).

Under the scope of cryptocurrency investment, Patil (2019) found that millennials hold a positive attitude about cryptocurrency investment. This finding was collected from millennials who have diverse professional background and own an awareness about this type of investment. Nevertheless, the level of experience in cryptocurrency market categorised millennials in Patil (2019) into newbie investors and experienced investors. For new investors, they welcomed cryptocurrency with a confident attitude; however, the lack of experience in investing seeds hesitation and doubts among these millennials in cryptocurrency. On the contrary, cryptocurrency is perceived as an useful financial assets among experienced investors (Patil, 2019).

Cryptocurrency market associates with volatility and high risk. Therefore, it is necessary to assess investors' attitude in this market in various aspects. By adopting Technology Acceptance Model, Borah et al. (2023) unlocked Indian millennials' attitude in cryptocurrency investment with perception in risk, ease of use and influence from social factor. It is identified that perceived risk and millennials' attitude towards cryptocurrency has an inverse relationship (Borah et al., 2023). This indicates a barrier of entry into cryptocurrency investing that was created in millennials' attitude if they perceive cryptocurrency as risky. Moreover, the ease of use and social influence have a positive relationship with millennials' attitude towards cryptocurrency (Borah et al., 2023). Sharing the same school of thoughts, Juwita et al. (2022) and Saputra and Maradona (2023) confirmed Borah et al. (2023)'s findings. Interestingly, Juwita et al. (2022) claimed that millennial cryptocurrency investors are not rational since they have strong dependency on others' perspectives and behaviours. Nevertheless, Bhilawadikar and Garg (2020) concluded that millennial investors are rational and their decision in cryptocurrency market are not relied neither on emotions nor social media. In fact, millennials calculate and evaluate their investing strategy by using market cycles and investment principles (Bhilawadikar and Garg, 2020).

Bauer et al. (2017) found that millennial generation has more favourable views towards wealth than Generation X. A study of variation was used to assess variations in views on the value of financial freedom, risk taking and confidence of investors in relation to personal finances. The findings uncovered that both millennials and Generation X expect they will lead more materially stable lives than their ancestors. Unlike millennials, Generation X values protection over economic prosperity and do not expect to retire until they are at least 65 (Bauer et al., 2017). Moreover, millennials are more likely to take chances compared to Generation X. Generation X is less accepting of new ideas than millennials. Neither generation thought that payment from social security or a pension scheme would meet their retirement needs.

Sharing the same school of thought, Ahmad (2019) found that Generation X and millennials are, in general, very close in their attitudes towards financial freedom, risk taking and trusting others with their financial preparations. Nonetheless, there is a substantial gap in homeownership perceptions between millennials and Generation X. Millennials have a higher desire to purchase an apartment for financial stability than Generation X. Also, millennials are more interested in getting more encounters than baby boomers. Millennials are much more likely to publicly post their memories and travels online than Generation X (Ahmad, 2019).

### 2.6.4. RISK ATTITUDE

Financial judgments are taken on the basis of cognitive and emotional aspects. This means that personal beliefs, emotions, personality traits and social influence impact on financial decision making; fear and greed, in particular, are fuelling bubbles in financial markets (Olsen, 2011). Nevertheless, investment choices are largely focused on a risk-benefit comparison.

Several observational studies have found that risk-seeking customers purchase stocks more frequently than risk-averse consumers (Clark-Murphy and Soutar, 2004; Tigges et al., 2000; Wärneryd, 2001; Wood and Zaichkowsky, 2004). Although no or little association has been found between the general risk attitude and risky investing decisions of individual investors (Morse, 1998; Wärneryd, 1996), there is a substantial correlation between a more particular investment risk

attitude that captures the risk appetite for investment and the riskiness of investment portfolios (Wärneryd, 1996). This is consistent with explanatory arguments that risk taking is unique to the domain (Weber et al., 2002). However, people with high incomes and men have more favourable attitudes about financial risk than those with low incomes or women.

Investing in the stock market makes for both capital rewards and the appreciation of high achievement. However, most people tend to create capital from their bank accounts or real estate transactions (Gunnarsson and Wahlund, 1997). Prospect theory's model of risky choice (Kahneman and Tversky, 1979) demonstrates that risk tolerance is to be predicted and most individuals appear to be less likely to take chances when they will benefit from them. Likewise, making gains due to the nature of potential business trends would be considered risky.

Moreover, attitudes to risk change over time as society changes and people's desire to afford to fail changes (Josef et al., 2016). Evidence demonstrated that the ability to take financial risk dramatically declines for people who are retiring or close to retirement (Finke and Huston, 2003). In addition, Gai and Vause (2005) calculated investor risk appetite (which depends on their risk attitude) in the UK and showed that it fluctuates across a relatively small range during "standard" periods but drops dramatically during crises.

### 2.6.5. MILLENNIALS' ATTITUDE TO RISK

Although, it is clear that the average investor, regardless of age, is usually risk-averse, the key determinants of millennials' investment habits and opinions are somewhat different from those found in previous generations. Hooker (2017) noted that there was a strong trend that the vast majority of millennials do not actually participate in the stock market compared to Generation X and baby boomers. Indeed, research into cohort discrepancies shows that millennials have notably more conservative financial trends than baby (Schewe et al., 2000).

Individuals differ significantly when it comes to the level of risk that they are able to bear in a particular situation (Mandrik and Bao, 2005). Risk perception and risk aversion are related to contextual and environmental influences (Bateman et al., 2007), awareness and experience (Kraus et al., 1992; Taylor and Dunnette, 1974) and faith in one's abilities to make sound decisions (Krueger and Dickson, 1994). Millennials have grown up in a world fraught with risk and ambiguity; the cohort continues to display lower levels of financial literacy (Lusardi and Mitchell, 2010; Lusardi and Mitchell, 2011) and are known to contend with trust in decision making (Howe and Strauss, 2003). Furthermore, millennials seem to have poor financial education and those who are moderately low in financial knowledge are more readily affected by briefly triggered risk attitudes (Lusardi et al., 2010).

Larson et al. (2016) studied the relationship between knowledge and risk in the case of millennials' retirement investment decisions. Their results indicated that millennials with lower levels of subjective financial understanding, less familiarity with financial planning and lower financial risk tolerance preferred more cautious retirement options than those with higher levels of financial knowledge, greater familiarity with financial planning, and higher financial risk tolerance. Although risk taking was calculated in terms of self-reported financial risk tolerance and general risk aversion, there was a greater correlation between financial risk tolerance and retirement investment choice than between general risk aversion and retirement investment choice. The results from Larson et al. (2016) suggested that financial risk aversion and financial experience play a key role in millennials' investment decisions. Moreover, income assurances are likely to be important to millennials on the basis of the financial exposure that they and their families may have had (Brown, 2018; Stanley, 2013) and this pattern is associated with the concerns that millennials may have about saving (Usriyono and Wahyudi, 2023).

Larson et al. (2016) also explored the value of risk by evaluating how risk manipulation influences the investment decisions of millennials, based on their level of financial literacy. Evidence suggests that actions taken by people with low levels of domain awareness are more deeply affected by circumstances and perceptions (Schwarz, 1990). Domain knowledge facilitates effective information retrieval (Reyna and Lloyd, 2006) and those with knowledge are less likely to rely on mental heuristics, such as "feelings-as-information" (Schwarz, 1990). This shows that a

primed risk manipulation should have a more noticeable impact on the financial decisions of individuals with low levels of financial literacy relative to individuals with high levels of financial literacy.

Ichwan and Kasri (2019) analysed the factors that affect the intention of millennials in Jakarta, the capital of Indonesia, to invest in P2P lending in the field of technology by using TAM. The findings of their study revealed that the decision to invest in P2P lending was positively associated and affected by the variable attitude, which itself was influenced by factors such as perceived ease of use, experience and trust in P2P lending. In other words, there is a strong relation between risk expectations and respondents' attitudes towards P2P lending. Ichwan and Kasri (2019) stated that the findings can partially be clarified by the fact that the majority of the respondents did not yet have adequate information relevant to P2P lending. This result is in line with the results of Chen et al. (2016), who demonstrated a positive correlation between risk and the motivation of respondents to have loans/invest in P2P lending.

In Shetty et al. (2023), millennials have awareness about Bitcoin. However, the majority of Shetty et al. (2023)'s sample was uncertain about Bitcoin purchase due to lack of risk enhancement. Cryptocurrency is perceived to be riskier than stocks by nearly half of the respondents (Shetty et al., 2023). However, the level of perceived risk is defeated by the perceived usefulness as millennials decide to invest in cryptocurrency because of the high returns (Shetty et al., 2023). This suggests millennials have high level of perceived risk and they prefer to invest in risky assets as captured in Bhilawadikar and Garg (2020).

## 2.7. WHAT IS INVESTMENT BEHAVIOUR?

Investment behaviour has been extensively researched in a variety of fields, with an emphasis on various investment properties and multiple acceptance models. Ali (2011), for example, investigated the investing behaviour of Australian private investors using a sample of 136 investors and PLS. According to their results, perceived risk, perceived returns and trust have a significant

impact on individual investors' trading decisions, while attitude towards brand partially mediated the relationships. Furthermore, Pascual-Ezama et al. (2014) studied investor activity in the Spanish capital market using TPB. The research was based on a sample of 127 individual investors and the SEM tool. According to their results, attitudes and perceptions have an important effect on investing behaviour. Furthermore, it was discovered that SN have little substantial effect on investing behaviour.

Sondari and Rahmat (2015), on the other hand, employed TPB to investigate the behavioural intentions of Indonesian investors. The results of data analysis using PLS revealed that attitude towards investment and SN had a significant impact on investment intention, while self-efficacy had no significant influence on investment intention. In another scenario, Shabgou and Mousavi (2016) studied the behavioural influences influencing the decisions of prospective investors in Iran; they surveyed 385 people. Their results showed that heuristic factors, potential factors and demand factors, as well as herding effect factors, have an impact on the decision making of investors. Cuccinelli et al. (2016) used TPB to investigate the financial behaviour of Italian clients and advisors. They found that attitude, SN and perceived behavioural management had a major impact on financial behaviour, while previous investment and financial literacy had little effect on investment behaviour.

Trang and Tho (2017) examined the impact of perceived risk and investment success on investment behaviour in Vietnam's developing market. A hybrid approach was used, which included 50 interviews and 465 dispersed questionnaires. According to their results, perceived risk had a direct positive effect on both investment efficiency and intentions and an indirect impact on investor decisions.

Vuk et al. (2017) investigated the effect of trust and risk aspects on Slovenian students' ability to invest. According to their results, trust had no clear beneficial effect on people's intentions to invest. Financial risk, on the other hand, had a strong beneficial impact on investment intention.

Based on the aforementioned studies, it is noted that there is a significant causal link between an individual's perception and behaviour. The possibility that an individual will perform a particular behaviour in a distinctive area mainly depends on his or her perception of the action. Therefore, in the next section, the author will identify which factors have a direct influence on an individual's behaviour, starting with perception.

### 2.7.1. FACTORS AFFECTING BEHAVIOUR

#### 2.7.1.1. PERCEPTION

In terms of finance, one's behaviour is directly correlated with one's perception of finance. This was illustrated by Linciano et al. (2018) who reported that Italian investors' risk perception was affected by financial transparency and financial information. They conducted a study on a group of Italian investors using a market testing methodological approach: 254 bank customers were given four distinct models, each incorporating a different type of data (historical and prospective) and framing (words, figures and charts) to represent the same amount of risk and return of four real-world financial instruments (Linciano et al., 2018). The formats of representation partly aligned with those required by regulators and used in the financial industry. Their findings indicated that the manner in which information is revealed influences the perceived risk of financial goods. Furthermore, investors' characteristics, such as gender, age, financial literacy and investment habits, can amplify framing effects, which result in biased risk perception that leads to biased investment decisions. Their evidence supports the argument that due attention should be given to how financial disclosure and investor education programmes can be structured to improve investor protection. The perceived risk of financial report disclosure heightens the perceived risk of the investment being solicited. Overall, considering investor heterogeneity and behavioural biases, neither simplification of disclosure nor a "one-size-fits-all" solution would be adequate to guarantee accurate risk perception and deter impartial investment decisions (Liano et al., 2018).

However, relatively few studies have analysed investor behaviour in the field of blockchain technology, especially Bitcoin. In this regard, Jonker (2018) published one of the most recent

surveys, which examined the adoption expectation and real use of Bitcoin by Dutch retailers. According to their report, retailers' use of Bitcoin is still restricted. However, respondents shared an interest in using blockchain payments in the near future. Furthermore, the results showed that the effects of customer acceptance of crypto payments, the retailers' perceived net transactional benefits associated with crypto payments, and the retailers' perceived extent of adoption efforts are all factors driving retailers' readiness to accept Bitcoin payments. On the other hand, factors that restricted cryptocurrency use by merchants were poor market appetite and the perceived small added value of crypto payments relative to other conventional payment methods (Jonker, 2018).

Ayedh et al. (2020) is mentioned as one of the earliest studies that examine Muslim communities' perception of, and willingness to invest in, the Bitcoin market. Data from a group of 200 Muslim respondents in Malaysia was obtained via a survey questionnaire. The data was analysed using SEM, simple descriptive statistics and a single sample test. The findings revealed that perceived ease of use, profitability, SN and trust had no impact on Malaysian Muslims' willingness to invest in the Bitcoin industry.

#### 2.7.1.2. DEMOGRAPHIC

According to Barber and Odean (2013), financial markets (and therefore cryptocurrency markets) are subject to an adding-up constraint: When someone buys something, someone else must offer it. As a result, the success of one trader necessitates the loss of another, which turns investing into a zero-sum game. When investment costs, such as trading commissions, are included, most retail investors underperform on the market. Specific stock owners' returns are estimated to be 1.5% smaller than the price benchmark, with active investors underperforming by 6.5% (Barber and Odean, 2013). However, composite figures on underperformance obscure the substantial disparities between individual investors. As a result, the author would like to examine whether the socio-demographics of the investors influence their behaviours in investment.

According to the literature, men trade more often than women and earn lower average returns, while both underperform the economy (Barber and Odean, 2013). Anderson (2013) found that

individual equity investors' socio-demographic features impact their investment efficiency. Less diversified investments, higher trading volume and poorer financial results correlated with lower income, wealth, age and education. Korniotis and Kumar (2011), on the other hand, found that investment efficiency decreases with age. Stock acquired by investors with a high IQ provides high positive returns over investment horizons of up to one month, according to Grinblatt et al. (2016). Additionally, Hooker (2017) noted that the vast majority of millennials do not participate in the stock market relative to 51% of Generation X and 48% of baby boomers.

Similarly, well-educated buyers outperform the general population by up to 3.6% a year (Korniotis and Kumar, 2013). When studying cryptocurrency investors, Ante et al. (2020) found that cryptocurrency investors are usually male, 38-years old on average and have a monthly net income that is above average. Their results are in accordance with Lammer et al. (2019) who reported that cryptocurrency investors are more likely to be men, have higher portfolio wealth and utilise other banking innovative products and services. Their findings were derived from an investigation of investments in organised retail goods using administrative data from a German bank to evaluate the personal characteristics and investment habits of indirect cryptocurrency investors. Furthermore, the portfolios and behaviours of cryptocurrency holders varied dramatically from those of their peers; they log into online banking more frequently than non-cryptocurrency holders, trade more frequently and carry more shares, especially more single stocks. These disparities, especially in terms of the number of trades and logins, became much more pronounced in the time frame following their initial Bitcoin investment.

However, demographic factors are investigated not only in the investment field, but also in other areas and are considered the main influence on a human's behaviour. In particular, the potential growth of online shopping among various ages and individuals has triggered several researchers to research about the impact of the demographic factors of consumers on online shopping behaviour. Richa (2012) applied mixed methods to analyse the effects of the demographic factors of consumers on online shopping parameters, which were satisfaction with online shopping, future purchase intention, frequency of online shopping, number of items purchased and overall spending on online shopping. Questionnaires were used to gather data from 580 respondents from Delhi, Mumbai, Chennai, Hyderabad and Bangalore. The findings revealed that numerous demographic

factors, such as age, gender, marital status, family size and income, have a major effect on online shopping in India (Richa, 2012).

#### 2.7.1.3. PERCEIVED USEFULNESS (PU)

According to TAM, one of the key factors influencing behavioural intention is PU. Davis et al. (1989) characterised PU as the degree to which a person believes that using a certain method would improve one's efficiency. According to Masrom (2007) and Venkatesh and Morris (2000), PU has a positive and important effect on individual behaviour that governs one's decision to use a technology. Sun et al. (2008), Ong and Lai (2006) and Selim (2003) all stated that when a course's website is seen as helpful, an individual's acceptance and desire to use it increases.

From Patel and Patel (2018)'s research, there is a major positive relationship between PU and internet banking service acceptance and behaviour. In addition, Alalwan et al. (2016) asserted that mobile banking penetration and behaviour have a substantial impact on PU. Moreover, Jin et al. (2014) investigated the principles or theories around the relationship between PU and trust in online shopping activity; they found that PU and trust were major elements that led to positive online shopping behaviour among North Malaysians.

### 2.7.2. RELATIONSHIP BETWEEN ATTITUDE AND BEHAVIOUR

Since Wicker's (1969) seminal review, the association between beliefs and behaviour has been a major issue in social psychology. An investor's attitude refers to their appraisal of a given item with a degree of favour or disfavour. Behavioural intention indicates an individual's readiness to execute a given behaviour (Fishbein and Ajzen, 1975); for instance, people support the political party that they find the most enticing. Nevertheless, early research of the causal link between attitudes and behaviours yielded conflicting findings. Therefore, a second wave of research about activity–behaviour relations concentrated on a new angle and analysed the causes and circumstances under which attitudes are more likely to predict behaviour (Glasman and Albarracín,

2006; Verplanken and Aarts, 1999). However, according to Glasman and Albarracín (2006), these techniques often had a fundamental limitation: research focused on an experimental methodology and was often unable to provide a process-based and scientifically grounded picture of the causal interaction between attitude and actions. Glasman and Albarracín (2006) raised the level of research to a greater level of abstraction and performed a meta-analysis of the attitude–behaviour relationship to resolve these shortcomings and with a view to provide a conclusive perspective of the factors that affect the attitude–behaviour relationship; their analysis culminated in two key influences: attitude accessibility and attitude stability.

A simple example of attitude accessibility is a public opinion poll of how people feel or think about various topics. Some people will answer the question before the interviewer has done, and others will take a few minutes before they answer it. This concept is referred to as accessibility in attitudes and is mainly identified with the work of Fazio et al. (1989). According to Fazio et al. (1989), attitudes are more likely to predict actions if they can be quickly recalled from memory. In the present context, this means that a fast response is an indicator of highly accessible attitudes since it does not take long to recover an attitude from memory, whereas a slow response indicates that more time is required to do so, thereby reflecting an indicator of low attitude accessibility. The definition of attitude accessibility is based on the underlying associative learning paradigm, in which the attitude is seen as a relation between the object of the attitude and its assessment. With respect to the attitude–behaviour relationship, a high level of attitude accessibility is strongly predictive of an attitude–behaviour relationship. In order to resolve contradictions in an attitude–behaviour relationship, it is important to recognise variables that have an effect on its theoretical replacement of accessibility.

The second alternative to predictive efficacy of an attitude–behaviour interaction is attitude stability (Glasman and Albarracín, 2006). Stable attitudes are described as attitudes that display little ambivalence over time (Conner et al., 2022). Various experiments have found that strong attitudes remain consistent over time (Fazio and Olson, 2003; Bagozzi, 1981). In comparison to attitude accessibility, attitude stability is a long-term concept. With attitude accessibility, high attitude consistency results in a greater and more stable attitude–behaviour relationship and is

affected by public–private communication and intra-attitudinal correspondence (Glasman and Albarracín, 2006).

Furthermore, studies on the relationship between attitude and behaviour fall into many groups. One group involves experiments in which neither the purpose nor the activity component of the attitudinal entity correlates to the target or action component of the behavioural entity. The research of Ajzen and Fishbein (1977) revealed that the findings of such experiments are likely to be unreliable and that the association between attitude and behaviour is usually very poor. It seems that the researchers challenged the predictive validity of attitude tests mainly based on research in these two groups. However, according to the most recent work about the relationship between attitude and behaviour, Mahardhika and Zakiyah (2020) indicated that there is a correlation of attitude and behaviour, and the correlation has a positive link with millennial investors' investment intention.

In a nutshell, one could conclude that the attitude and behaviour of an individual are connected. Nevertheless, due to the conflicting results in previous literature (Ajzen and Fishbein, 1977; Fazio et al., 1989; Mahardhika and Zakiyah, 2020), the author would like to further investigate this relationship in an investment context to test whether millennial investors' attitude has a major influence on their behaviours in the cryptocurrency market. Therefore, illustrations of different attitudinal models in section 2.8 were formed for this purpose and to refine the most applicable model for this study.

## 2.8. THEORETICAL FRAMEWORK

### 2.8.1. ATTITUDINAL MODELS

#### 2.8.1.1. TPB

A crucial step in the history of attitude theory has been the development of the TRA and its successor, the TPB. Both theories are based on the idea that behaviours depend jointly on

motivation (intention) and ability (behavioural control) (Ajzen, 1987, 1991). However, empirically, TRA operationalisation (Fishbein and Ajzen, 1975) states that intention intermediates between behaviour and the attitude towards the behaviour. Intention depends not only on attitudes, but also on SN or the perceived social pressure exerted by important others, such as parents and good friends, to perform or not to perform a behaviour.

The TPB represents an individual's awareness regarding limitations and facilitated circumstances that can impede or improve their ability to perform a behaviour, which, in turn, may affect their attitude and intention to perform the behaviour (Taylor and Todd, 1995). The TPB expands the TRA to include non-volitional habits for forecasting behavioural intention by covering assumed PBC. TPB notes that the behavioural intentions of an individual are affected by behavioural beliefs, SN and perceived behaviour regulation. Likewise, the theory claims that human activity is driven by three determinants: belief in the possible consequences of actions and evaluation of these outcomes (behavioural beliefs), belief in the normative perceptions of others and a desire to fulfil these expectations (normative beliefs) and belief in the existence of factors that can promote or hinder the occurrence of such expectations (normative beliefs, control beliefs). According to Ajzen (1991), an individual's behaviour beliefs, SN and perceived behavioural influence will predict his or her intention to perform particular behaviours. Additionally, Weigel et al. (2014) stated that the three influences that direct human activity in TPB are positively related to attitude, SN and PBC.

Attitude is considered to be the key variable of one's behaviour (Brock and Green, 2005). Based on the expectancy–value model, attitude towards a behaviour is determined by the total set of accessible behavioural beliefs linking the behaviour to different outcomes. In TPB and TRA there is a clear relationship between attitude and behaviour (French et al., 2006).

Salient behavioural beliefs, together with result judgments, are hypothesised to lead to attitudes, which, in turn, lead to an expectation to conduct an action and to behaviour itself. Furthermore, Breckler and Wiggins (1989) demonstrated that two components affect attitude. The affective component of attitude refers to the emotions and drives produced by the prospect of behaviour; while the instrument aspect of attitude refers to a more cognitive analysis of the degree to which

performing a behaviour will be beneficial. In the context of cryptocurrency investment, if one perceives investment in cryptocurrency to be risk free or its implications are not significant, the intent to adopt cryptocurrency will be more likely to be higher and vice versa. Therefore, the mixture of assumptions about a behaviour's consequences and the evaluation of these consequences affect attitude.

Numerous experiments use TPB to model attitudes to predict intentions and attitudinal variables (Sentosa and Mat, 2012; Bai et al., 2019, Rajeh, 2022). TPB was applied to examine enrolment in Fintech innovation courses in South Africa by Mazambani and Mutambara (2019); they collected quantitative data to forecast adult student distance learning admissions at Mancosa, Cape Town campus. Their results suggested that behaviours and perceived behaviour influence (attitude) have a positive effect on the decision to accept cryptocurrency. In the research of Shah Alam and Mohamed (2011), strong positive attitudes to halal food products were proved to have a significant and positive correlation with halal food purchasing intention. These results are in accordance with Yang et al. (2017) who claimed that TPB was a strong model for forecasting the behavioural preferences of future consumers of smart home services; they reported that the desire to use is positively linked to attitude, subjective standard and PBC.

#### 2.8.1.2. TAM

TAM (Davis, 1989) is a well-known model that describes how users embrace technology. TAM is an extension model of TRA and TPB. In TAM, the behavioural purpose of an individual to use a system is determined by two factors: PU and perceived ease of use (Diatmika et al., 2016). PU is described as the degree to which a person believes that using a particular system would improve their performance (Davis, 1989). Davis (1989) defined perceived ease of use as the believes of an individual in using a particular system would be effortless. The correlation of perceived ease of use and PU with system characteristics and the likelihood of system use is examined in TAM. Moreover, various factors have an effect on PU and perceived ease of use, namely, voluntariness, experience, SN, image, importance of work, quality of performance and demonstrability of outcomes (Diatmika et al., 2016). Dash et al. (2011) applied the TAM model to learn the attitudes

of people towards the adoption of internet banking. Their findings support the view that variables are predicted by perceived ease of use and social impact, influencing PU and attitude as intervening variables, and the dependent variable is intention to use internet banking.

Regardless of the fact that TAM is well known and regarded as a stable, efficient and parsimonious IT acceptance model, some researchers argue that it may not fit well in dynamic and volitional contexts where users' personal characteristics, and social and economic variables may be involved in influencing customer behaviour (Kaba and Osei-Bryson, 2013). TAM demonstrates less ambiguity for only two determinants of behavioural motive. For example, Taylor and Todd (1995) incorporated TAM with the TPB into a new paradigm, later known as the decomposed theory of planned behaviour, consisting of nine determinants of purpose. Their findings showed that the new paradigm improved the explanatory capacity of TAM by only 2% (from 34% to 36%). They suggested that parsimony is important when realistic implementations are expected from the model, whereas parsimony is a less crucial problem when the key concern is to achieve a complete understanding of a particular phenomenon. And yet, Venkatesh et al. (2003) pointed out that this parsimony advantage of TAM can also be seen as a weakness of the model. While the aim can be anticipated, TAM does not have adequate knowledge to help decision makers gain greater adoption of emerging technologies.

### 2.8.2. PERCEIVED RISK MODELS

Faqih (2016) described perceived risk in behavioural research as consumers' perception of the degree of ambiguity and potential negative effects of using or purchasing a commodity. Perceived risk has been identified as a determinant of customer behaviour in relation to purchasing intention (e.g., Salisbury et al., 2001; Kannungo and Jain, 2004), as well as an indicator of technology acceptance (e.g., Salisbury et al., 2001; Kannungo and Jain, 2004; Featherman and Pavlou, 2003).

Several recent research studies have conflicting findings about the effect of potential risk on the decision to use Fintech. Khan et al. (2017) validated perceived risk as a significant antecedent of

behavioural intentions in their analysis of the decision to use online banking. Kishore and Sequeira (2016) illustrated that perceived risk has substantial moderate explanatory power in terms of rural mobile banking adoption. Although the direct impact of perceived risk on the intention to use mobile banking is insignificant, Shaikh et al. (2018) found that it plays an important role in the pre-adoption process and affects other variables that later specifically affect intention to use. Safeena et al. (2013) demonstrated that users should be aware of the benefits, security issues and the associated risks of internet banking adoption. Therefore, the TPB was applied with the addition of two extra variables. It provided more comprehensive theoretical perspectives of users in relation to adopting internet banking.

Moreover, Hansel et al. (2018) found that an increase in perceived risk seems to reduce social media users' risk-taking propensity, and risk-taking propensity, in turn, has a direct effect on action purpose. An increase in perceived trust, on the other hand, has been shown to increase risk-taking proclivity and, as a result, behavioural intention. Hansen et al. (2018) demonstrated that perceived risk has a direct effect on the attitude and behavioural control of individuals. They integrated TPB and TAM to investigate the relationship between risk, trust, perceived ease of use and behavioural control to predict consumers' use of a social platform for transactions.

Therefore, in terms of evaluating the effect of risk on individuals' behaviour or investors' decisions, there have been different proposals, models and theories that incorporate the most relevant dimensions in the process of making a decision or adopting a phenomenon. Two behavioural theories have been widely adopted to investigate the perception of risk, which are TPB and TAM. In the two sections below, the author will evaluate each of the behavioural theories under the perspective of risk; first is TPB and last is TAM.

#### 2.8.2.1. TPB

As aforementioned, TPB expands TRA to include non-volitional habits for forecasting behavioural intention by covering assumed PBC. TPB notes that the behavioural intentions of an individual are affected by behavioural beliefs, SN and PBC.

The perception of an individual about how simple or difficult it is to perform a particular action is defined as PBC (Ajzen, 1991). PBC is composed of difficulties and control factors; this indicator tackles the problem of not being able to perform an action regardless of the fact that the attitude of a person and SN support the performance of an individual. Hence, higher PBC levels may represent a secure environment in which cryptocurrency is transacted and lead a person to perceive an action to be less risky or not without safeguards. Lower PBC levels may indicate the perception of a riskier environment in which to transact with less or unknown safeguards in place. These lead to the conclusion that a person would be more likely to adopt cryptocurrency if he or she perceives a higher degree of control. In turn, PBC can influence purposes that are based on the ease or complexity of doing so securely. According to Ajzen (1985), behavioural control can be evaluated by two factors: internal control factor and external control factor. TPB uses situation-specific beliefs, thus, this model has the potential to easily capture external control factors along with internal control factors. For example, in the study of Schaupp and Festa (2018), individuals with higher PBC towards cryptocurrency usage will exhibit higher intention to use. This suggests PBC is positively associated with intention to adopt the use of cryptocurrency. The results are in accordance with the findings of Mazambani and Mutambara (2019) and Muhammad et al. (2020).

Sanayei and Bahmani (2012) created an extended TAM with a TPB model to forecast and clarify customers' behavioural intentions regarding the adoption of online banking. Five basic risk aspects – financial, security, performance, social and time – were combined with TAM and TPB models to suggest a theoretical model to understand customers' intention to use internet banking. The findings suggested that the proposed model has strong predictive potential and is robust in forecasting consumers' plans to use such services. Security, financial, time, social and performance risks all emerged as deterrents to embracing internet banking.

#### 2.8.2.2. TAM

According to Arias-Oliva et al. (2019), TAM has the ability to analyse the risk factors that affect cryptocurrency use in Spain. Their findings showed that success expectation and enabling factors have the greatest explanatory force for an individual investor's decision to use cryptocurrencies. Effort expectation had considerable predictive capacity as well, although it had a lower impact. The remaining variables, which were social impact, perceived risk and financial literacy, had no effect. However, willingness to manage cryptocurrency risk could be a precondition for adoption.

Hansen et al. (2018) investigated possible relationships between antecedents associated with perceived risk and trust and customers' preferences to use social media networks for purchases historically associated with the e-commerce context. Hansen et al. (2018) stated that previous findings (Benson et al., 2015) indicated that the perceived risks and trust relating to online transactions, as well as trust in relation to the virtual environment, are likely to affect decision making and behaviour intentions. Thus, Hansen et al. (2018) hypothesised that users' perceptions of risk and trust may affect their attitudes and intentions to use social media for commerce (TAM and TPB elements). They hypothesised that increases in perceived risk would decrease TAM and TPB elements, whereas increases in trust should increase TAM and TPB elements, with both often influencing risk-taking propensity, which in turn influences intention to use social networking technology for transactions. Although both TAM and TPB explained an essential part of consumers' behavioural intention, there is a notable interaction: the perceived ease of use (from TAM) amplifies (i.e., positively moderates) the effect of behavioural regulation (from TPB) on intention to use social platforms for transactions. Furthermore, both perceived risk and trust have significant effects on individuals' risk-taking propensity, which has a significant impact on behavioural intention. Risk and confidence can be challenging and nuanced to empirically model in science because they can be linked to a wide range of factors (Hansen et al., 2018). The level of perceived risk has a significant inverse relationship with risk-taking proclivity, while perceived risk has a significant positive relationship with perceived ease of use, attitude and behavioural control. The findings are consistent with the view that consumers, on average, perceive systems with lower risk due to improved security measures/design to be more difficult to use, less useful and they give them less power due to the increased security protocols (Hansen et al., 2018). Furthermore, their findings reinforced the suggestion that perceived risk and trust serve as counterbalances to a person's established risk-taking proclivity.

Abramova and Bohme (2016) combined different advantages and threats of Bitcoin usage to shape the multidimensional structures of perceived benefit and perceived risk using TAM. They wanted to empirically validate a theoretical model that illustrates the use of Bitcoin as a legal online payment mechanism for payments and money transfers. In addition, they defined many philosophical and analytical growth opportunities for technological adoption theories in the framework of decentralised and shared economy networks. They asked participants to score their attitude towards different types of risk. Their findings support the widely held belief that people are concerned about cryptographic currencies. Bitcoin is unlikely to draw a larger user base owing to its fluctuating valuation, the possibility of financial damage in the event of a malfunction or security violation in service providers' networks or users' own computers, and a lack of customer safety. This, in particular, has a number of significant consequences for practice. First, the fear of financial risks due to counterparty risk or security accidents necessitates well-thought-out risk control techniques and customer insurance cover. Some wallet vendors (for example, BitGO and Coinbase) also work with insurance agencies to provide their customers with insurance plans against specific forms of security risks. However, there is little competition for the insurance and security of actual Bitcoin holders, mostly because the way Bitcoin works makes it difficult for insurers to check fraud allegations. Second, the need of Bitcoin consumers to be lawfully covered illustrates the need for a consistent policy for governing digital currencies in order to guarantee both customer security and Bitcoin stakeholders' conformity with the law. Consequently, the study found that Bitcoin users and consumers are concerned with potential regulations that limit their behaviour on the use of Bitcoin (Abramova and Bohme, 2016).

### 2.8.3. COMPARISON OF TPB AND TAM IN THE CONTEXT OF CRYPTOCURRENCY ADOPTION

There are few research papers on the adoption and acceptance of cryptocurrency, there have been attempts to utilise the existing technology adoption and acceptance theories as well as models to evaluate users' intention to adopt cryptocurrency. Most research has applied TPB and TAM as their main theoretical framework. However, there is controversy over which model would deliver

the most precise result and whether the combination of TPB and TAM would increase the outcome's accuracy.

Based on the result of testing the hypothesis in the study of Mahardhika and Zakiyah (2020), it can be concluded that the TPB approach can be applied empirically to explain the behaviour of millennial investors in investing in stocks. However, this might be due to the preferences of millennial investors who do not consider risk when investing in stocks.

In cryptocurrency context, TPB is claimed to be a reliable theory to measure cryptocurrency investment intention (Norisnita and Indriati, 2022). On the other hand, the model relies on cognitions and omits other potentially important determinants of action, such as environmental influences and economic factors. According to Al-Azzam (2016), TPB assumes that the beliefs used to analyse the actions of users are consistent with a particular situation, but are not applicable in other circumstances and cannot be applied in other situations. This suggests that TPB may not be readily accessible across various contexts; pilot trials of relevant effects, comparison groups and control variables are important for the creation of an effective measuring instrument.

Janssen et al. (2015) applied TAM in their analysis of cryptocurrency as a promising type of payment platform. They conducted inductive interviews with 13 users in three distinct categories to assess the impact of the usability, usefulness and subjectivity standard on consumers' intention to adopt cryptocurrency. By focusing on three elements in TAM, the researchers pointed out that perceived ease of use has the lowest influence on most stakeholders and the effect of PU fluctuated based on consumers' category. Furthermore, all interviewees had confirmed cryptocurrency is a promising payment platform with future potential. However, their study had some limitations. The sample size was small as only 13 stakeholders were interviewed and that makes generalisation challenging; approaching a broader sample size via a quantitative method is strongly recommended in order to make generalisation feasible. In addition, one-third of the stakeholders are currently employees of Bitcoin exchanges; this means the findings might be biased as their views on cryptocurrency would be seen as too optimistic and promising.

Abramova and Bohme (2016) used TAM to combine multiple advantages and risks of Bitcoin use to form multidimensional constructs (perceived benefit and perceived risk model). They presented an empirically validated theoretical framework that would explain the use of Bitcoin as an online payment for legal transactions and transfers of funds. Moreover, they described different conceptual and methodological growth potentials to be incorporated into the theory of technology adoption in the context of decentralised and shared economic systems. This approach has been declared to be important in demonstrating key determinants and barriers to the use of Bitcoin by consumers. However, the limited sample restricts the robustness and generalisation of the results. Furthermore, the proposed model ignores other significant factors, such as hedonic advantages, SN, social factors, and fostering conditions or trust, which may have a significant impact on consumers' decisions to adopt cryptocurrency.

On the other hand, Legris et al. (2003) stated that findings under TAM are not consistent and clear. They argued that TAM is a useful model, but it should be incorporated into a broader model that interprets human and social change processes. Kwon and Chidambaram (2000) made similar criticisms of TAM and drew similar conclusions; they found that the model does not clarify a substantial portion of the variance and proposed that additional variables should be included in the analysis of cryptocurrency adoption.

Folkinshteyn and Lennon (2017) utilised the modified TAM developed by Pavlou (2003) to analyse Bitcoin as a currency and blockchain as Fintech from the users' and developers' perspectives. They used the modified TAM to assess the perceived ease of use, PU and perceived risk, and trust factors from the users' perspective of Bitcoin. Perceived risks included security risk, user error, loss of privacy and third-party service failure. The perceived ease of use construct included fast transfer, free participation and simple interface. Lastly, PU included full control over own money, low cost of transfer, disintermediation, transaction security and international scope. The nature and distinctive characteristics of cryptocurrency pose a challenging task to develop models that provide better understanding of cryptocurrency adoption.

Importantly, while testing individuals' attitudes, TAM is considered to deliver a better forecast of attitude than TPB (Mathieson, 1991). Also, Bagozzi et al. (1992) substituted TRA's attitude measures with two technology acceptance measures (ease of use and usefulness) from TAM. In TAM, ease of use and usefulness are the main influencers of attitude. Attitude and usefulness contribute to individual's intention. Perceived ease of use and PU were also predictive of pre-service teachers' attitudes towards technology use (Teo et al., 2008; Teo, 2012; Teo and Noyes, 2011), while PU forecasted by perceived ease of use of web technology in online teaching (Liu et al., 2010) and e-learning programs (Teo and Noyes, 2011; Badri et al., 2016). Although self-esteem was found to be a major predictor of attitudes in the TPB in Cheng (2018), its impact on attitudes was indirect through perceived ease of use and PU in the TAM (also indicated in the integrated model). As a result, TAM described the function of the relation between self-esteem and attitudes through behavioural beliefs (i.e., perceived ease of use and PU), which is, however, subsumed in TPB (Cheon et al., 2012).

However, in the context of cryptocurrency, it is concluded that the combination of TPB and TAM would provide more precise results compared to the application of each theory separately. In order to better explain Bitcoin adoption in South Africa, Walton and Johnston (2018) developed a quantitative questionnaire from which 211 quantitative and 121 open-ended comments were obtained. Also, TPB and TAM were integrated in their research to enhance exploratory power, which would be greater than the individual use of either TAM or TPB. Their findings revealed that perceived benefit, attitude towards Bitcoin, SN and perceived control influenced the participants' intentions to use Bitcoin directly. Attitude towards Bitcoin was predicted by PU, perceived ease of use, perceived benefit and perceived trust-related risk supporting their hypotheses. This means participants' attitude was influenced by their perceptions of trust-related risk, ease of use, usefulness and benefit. It is clearly seen that the combination of TPB and TAM created more precise results since TAM variables supported explanation of attitude variable in TPB.

Likewise, Yoo et al. (2020) indicated that combining TPB with other models could offer more powerful explanations for Bitcoin users' attitudes and behaviours. Additionally, they mentioned that although numerous studies have examined users' decisions and adoption of Bitcoin, the majority of them employed only a limited number of theories. This suggests that it is not easy to

provide explanations of the multidimensional aspects of users' intention. Therefore, to provide multidimensional explanations of both users-oriented and services-oriented perspectives regarding Bitcoin, Yoo et al. (2020) employed a comprehensive research model that included TPB, DoIT, the benefit-risk concept and transaction cost theory.

### 2.8.4. RATIONALE FOR SELECTING THE FRAMEWORK

TAM and TPB have been extensively used over the last decade to investigate technology use and e-service adoption (Davis, 1993; Hsu, 2004; Hsu et al., 2006). TAM and TPB, on the other hand, have not been shown to reliably provide superior interpretations or behavioural forecasts (Chen et al., 2007). However, given the lack of academic work on millennial investors' adoption of cryptocurrency and Bitcoin, TAM is a suitable candidate for the theoretical foundation of the first study of this kind, as it keeps the model parsimonious and supports the design of consistent measurements for a newly established research domain. Its parsimony, persuasive capacity and ease of use in diverse contexts illustrate why TAM is commonly used as a theoretical basis for research on consumer acceptance of new systems (Venkatesh and Davis, 2000; Venkatesh et al., 2003). The key benefits of TAM for this analysis are its simplicity, strong theoretical foundation, sufficient analytical support in the literature and a well-established calculation inventory as compared to other related models (Wang et al., 2003). Nevertheless, the author would like to incorporate attitude as a mediator of the effect of PU and ease of use as well as proving attitude is the main influence on investors' behavioural control. Therefore, along with TAM, TPB is applied as one of the underpinning theories of this research. TPB constructs, such as SN and PBC, which capture the control dimensions of investors, when paired with TAM may offer further insights into cryptocurrency adoption as a means of investment.

Since the two models are complementary, an increasing body of study has focused on combining them to explore technology use and adoption, and the findings have shown that the integrated model has greater exploratory capacity than the individual use of TAM and TPB (Bosnjak et al., 2006; Chen et al., 2007; Wu and Chen, 2005; Yoo et al., 2020). Since the emphasis of this research is on investment decisions in cryptocurrency and Bitcoin adoption, which is an example of

accepting an emerging technology that is interconnected with social structures and personal characteristics, the integration of TAM and TPB for this research context should be detailed to explore investors' intentions and acceptance of cryptocurrency as an investment.

Importantly, to provide explanations of the multidimensional aspects of millennial investors' perceptions of cryptocurrency investment, it is crucial to not solely refer to TPB and TAM. With the aim to conduct an accurate result for this research, TPB and TAM are utilised in combination with HDM. HDM is further explained in Section 2.9 to deliver a deeper answer because the integration of different theories could increase the accuracy of the research outcome.

## 2.9. HDM

### 2.9.1. DEFINITION

HDM is one of the methods for formulating and evaluating judgments using four steps: structuring the circumstance into a hierarchical model, making pairwise comparisons and obtaining a judgmental matrix, linking weights and accuracy of comparisons, and gathering weights across multiple layers to reach the final weights of alternatives.

In the case of HDM (Kocaoglu, 2016), subjective opinions expressed in pairwise comparisons are converted to relative weights in the scale of the ratio. It is claimed that the combination of pairwise comparison and hierarchical method could make the hierarchical decision-making system more powerful. Hence, pairwise comparison between criteria may improve the precision of the score-based evaluation of the criteria. By using the hierarchical system, the linkages and impacts between the parameters are seen to be correlated topics, which are useful for assessing the degree of conflict between stakeholders or experts.

This approach can be used to measure the judgement of single decision maker or multiple decision makers. Where multiple decision makers are involved, the HDM approach is an effective way to create consensus among decision makers where members of the group have different objectives (Kocaoglu, 2016). HDM connects decision-making elements at different levels of organisational entities in which decisions are taken at the operational level in favour of higher-level goals and objectives. When the goals are met, the final outcomes of organisational decisions will be converted into gains for the business. This is a systematic method, but it is difficult to measure the direct relationship between the benefits at the top of the decision-making hierarchy and the operational decisions at the bottom without splitting the difference between the top and bottom of the decision hierarchy into the intermediate level.

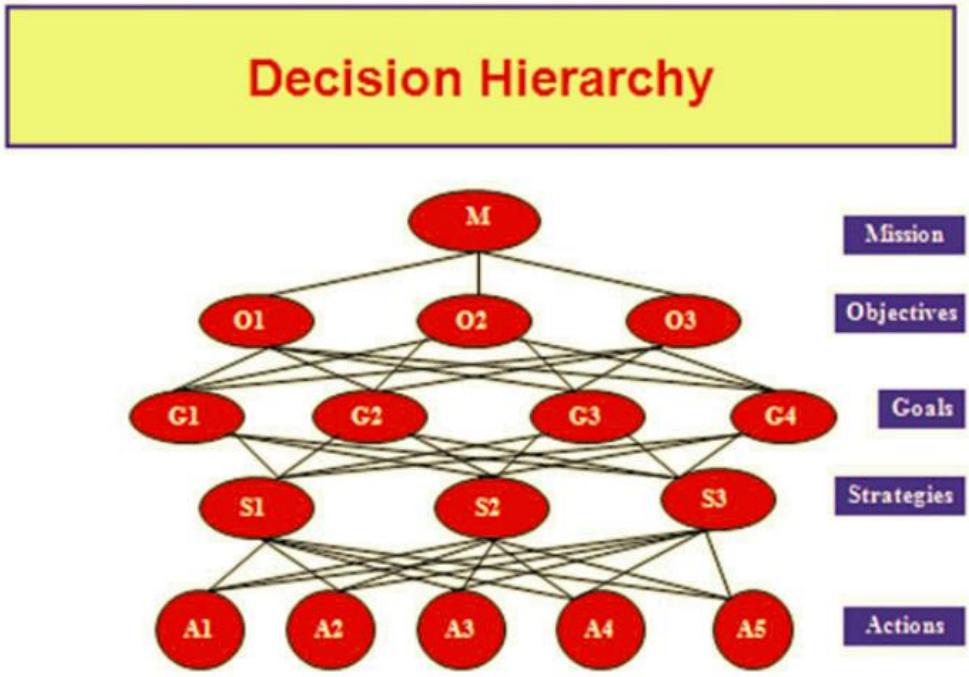


Figure 2.1. Hierarchical Decision Modeling (Daim, 2016)

The number of levels in HDM depends on the logical sequence of decisions involved. If too many levels are identified, the number of measurements will be extremely large; if too few levels are used, measurements will become difficult due to unnecessary aggregation. This approach is similar to an individual's decision-making process. In order to evaluate an individual's action or perception, it is essential to understand their goals and the reasons why they would like to conduct an action and the factors that drive their behaviour.

The starting point for the decision-making process is the creation of the mission and the goals. These are general statements specifying the overall benefits anticipated from coordinated activities. In view of the abstract nature of the goals and the challenge of creating a specific measure of success for the benefits, the objectives need to be followed. If the objectives have been established, the approach to achieving those objectives must be created. This is achieved by setting plans and identifying individual behaviour as components of the tactics.

Each level of such a decision hierarchy consists of multidimensional, sometimes conflicting, decision-making components. In Figure 2.1, multicriteria goals set out to the fulfilment of the mission. At the bottom, each action becomes part of one or more strategies with varying degrees of commitment to each strategy. Strategies affect several actions. The achievement of each goal results in the achievement of one or more of the goals. For instance, Hogaboam et al. (2014) outlined the significant steps that HDM takes in the research process, beginning with the structuring of the decision-making dilemma into stages, making a peer review of the interests of the decision maker, calculating the goals' targets and, finally, testing the accuracy of the decision maker's responses.

In the current context, HDM helps researchers study Bitcoin investors' decisions by evaluating objectives, perspectives and criteria of making an investing decision that matches with the author's intention. HDM has been adapted in numerous research studies of consumers' decisions to adopt certain technologies and determinants that affect consumers' adoption decision from a multidimensional perspective. For example, HDM was applied to analyse determinants determining users' decision about which was the best Carsharing alternative and it was used for evaluating consumers' purchasing decision when selecting from a choice of energy effective devices in South Africa (Daim and Blommestein, 2013). Additionally, Sheikh et al. (2016) implemented a hierarchical decision modelling method to select target markets for a proposed personal healthcare facility. They showed that the use of a HDM has been successful in addressing the question, "In the view of management and analysts, which target market is the most desirable?". Sheikh et al. (2016) also claimed that the technique could be adapted for other companies. Furthermore, a study established by Son and Sheikh (2018), which was based on the

evaluation of electronic authentication policies, considered four factors (politics, economy, society, technology) and used hierarchical decision-making modeling. They concluded that HDM demands a low degree of conflict, suggesting a consensus, but it is impossible to achieve a consensus if experts are from diverse stakeholders. In the field of blockchain, Alzahrani and Daim (2019) adopted HDM to analyse factors that influence US investors' cryptocurrency adoption decisions. They claimed that there was insufficient literature exploring the adoption and acceptance of cryptocurrency by consumers. The purpose of their paper was to fill a gap in the existing literature by investigating the current level of cryptocurrency adoption and the factors that influenced adoption. They presented an in-depth study of these factors, and addressed some of the pitfalls surrounding cryptocurrency adoption. Alzahrani and Daim (2019) proposed that the key factors, identified from a literature review, that contributed to the adoption of cryptocurrency were investment opportunities in cryptocurrency form, the confidentiality of transactions and privacy, business acceptance as a payment method, rapid transfer of funds, low transaction costs and technological curiosity. Nevertheless, Alzahrani and Daim's (2019) paper solely focused on the factors affecting the adoption decision, which might be a limitation.

Recently, Abbas and Kocaoglu (2016) identified reasonable limits for inconsistency and developed high-consistency thresholds for inconsistency in HDM. Besides, Sheikh et al. (2016) outlined some of the critical points that have arisen from the model development process. Their research covered the effects of expectations and how they were factors of contrast. This involved contrasting long-term and short-term goals, developing objectives and decision-making elements within a non-threatening setting, and involving both strategic and operational perspectives. They defined the benefits of HDM: it simplifies the difficulty of decisions while preserving the precision of the capture of assessments, and it serves as a reference in strategic planning and offers opinions and a context for decision-making patterns and sensitivity analyses. Hence, by applying HDM, the author will be able to identify both long-term and short-term objectives from stakeholders, and rank factors that determine objectives in relation to cryptocurrency without errors.

Furthermore, Chen and Kocaoglu (2008) stressed managing a sensitivity analysis for the HDM results to address the various contingencies. They claimed that the HDM method creates significant information in each level of comparison between the objectives, criteria and

alternatives, including the inconsistency and disagreement among the experts. This indicates that using HDM in studying investors' decision making in cryptocurrency investment can validate the accuracy and provide valuable to assess the importance of the results for this study.

Therefore, in this thesis, the author would like to adopt HDM in a multicriteria method. The application of this model would provide the author with the opportunity to not only understand millennial investors' perceptions of cryptocurrency investment, but also to find the ranking of the most important influencing factors. To serve the thesis's purpose, the author includes major perspectives (technical, economic, social and government) in the HDM. These perspectives were recognised from the literature review, and they have a strong influence on the adoption decisions of individuals in cryptocurrency investment.

### 2.9.2. TECHNOLOGICAL FACTORS

Technological factors are crucial in assessing whether a technology is favoured more or less than others. This is mostly true when other aspects are not considered, thus making a benchmark for the whole decision-making process. Additionally, there have been numerous studies declared that technology is one of the main reasons influence human behaviour (Alomary and Woolard, 2015; Presthus and O'Malley, 2017; Folkinshteyn and Lennon, 2017). However, only a few studies have examined the direct impact of cryptocurrency technology (blockchain) on cryptocurrency investors, especially millennial investors. Therefore, in the absence of testing the relationship between cryptocurrencies' technological factors and investors' behaviour, the author will illustrate three main components related to blockchain, which are control over the system, anonymity and system security to test their correlation with the adoption of Bitcoin among millennial investors.

#### 2.9.2.1. CONTROL OVER THE SYSTEM

Cryptocurrency technology allows Bitcoin to operate in a decentralised way with the absence of a central authority. This indicates that de facto control over monetary policy in cryptocurrency does

not exist; in addition, the influence of short-term interest rates and inflation do not prevail in the Bitcoin market. Bitcoin investors are allowed to trade in a free market with a high level of transparency since investors can access the public ledger that records all transactions. These transactions are verified by miners, who are part of the network (Alzahrani and Daim, 2019).

Since no particular organisation or individual has control over the system, investors are fully responsible for the network themselves. Cryptocurrency technology compensates for the loss of trust in governments' financial systems.

#### 2.9.2.2. ANONYMITY

The anonymity provided to investors is "pseudo-anonymity" in which the identities of users/investors are hidden with a private key (Schuh and Shy, 2016). If an individual tried to cash out by sending their coins to an exchange site in order to transfer money to a bank account, the identity of the transaction's sender or receiver could be determined. Furthermore, the anonymity presented by Bitcoin maintains confidential information related to investors' activities, savings and others. However, there might be a possibility of illegal activities since users can register several anonymous accounts with discretion which can affect the transparency of the commercial parties to a transaction (Alghamdi and Beloff, 2015).

Van Hout and Bingham (2013) studied the behaviour of users purchasing illicit commodities on Silk Road (an online black market); they disclosed that major motivators for users to trade is the anonymity of transactions and acceptance of cryptocurrency as a payment. A study revealed that one-third of Bitcoin investors in their sample presumed that Bitcoin is anonymous, whilst, in fact, it is pseudonymous (Krombholz et al., 2017. Likewise, researchers reported that a number of Bitcoin investors stated that they use Bitcoin for anonymity purposes and utilised certain methods to stay anonymous among cryptocurrency networks.

In a nutshell, cryptocurrency offers investors a higher level of anonymity than the traditional banking system. However, this favourable feature may raise a barrier to cryptocurrency adoption because governments would perceive it as a facilitator of crime.

#### 2.9.2.3. SYSTEM SECURITY

A hacker can hack a decentralised system of Bitcoin if that hacker owns more than 50% of Bitcoin on the network. However, as the decentralised Bitcoin system operates in a P2P network, a hacker would need massive computing power to hack the system. Likewise, a P2P network relies on users to manage their wallets; therefore, it is nearly impossible to take such action.

Nonetheless, there is a possibility that coins could be stolen if hackers got access to cryptocurrency users' personal computers. A number of Bitcoin investors claimed that they lost coins from wallet keys because of self-induced errors or security cracks (Krombholz et al., 2017).

### 2.9.3. ECONOMIC FACTORS

When assessing technologies, economic factors should also be taken into consideration beside technical aspects. There were various economic criteria in the existing body of literature but the two most feasible criteria are listed below.

#### 2.9.3.1. INVESTMENT OPPORTUNITY

Economic factors are also considered determinants of people's intention to use cryptocurrency. For many people, the current trend is to regard cryptocurrency an investment opportunity. Recently, the crypto market contained numerous kinds of coins that were priced under a UK pound or sometimes less than a penny. At the beginning, Bitcoin traded at less than a dollar but it reached more than US$18,000 by the end of 2017 (Alzahrani and Daim, 2019). Trading in Bitcoin is similar

to trading in the stock market. Since there are no barriers to entry, investors are enabled to invest directly in the cryptocurrency market. Despite the high volatility of the cryptocurrency market, cryptocurrency users are more interested in the investment opportunity than in its system (Glaser et al., 2014). Enhanced cryptocurrency prices and price volatility led to bubbles and crashes in the market. Hence, it is crucial that Bitcoin investors apply rationality in their investment decision making.

In 2009, mining was the only method to earn coins when Bitcoin was first introduced by Satoshi Nakamoto. However, Bitcoin users now consider mining a source of income, rather than an investment. There are several paths to invest in cryptocurrency, such as gambling, interest payment and trading.

Cryptocurrency can also be lent at a normal interest rate because cryptocurrency is a kind of money. Lending can be undertaken directly with Bitcoin users based on an agreement in which trust plays an important role. Moreover, platforms like Bitbond or BtcPop help users to match lenders and borrowers at preferred interest rates; they are intermediate platforms that support P2P lending.

#### 2.9.3.2. LOW TRANSACTION COST

The transaction fees of the traditional brick-and-mortar banking system are higher than the transaction fees of the cryptocurrency system. A low transaction cost will help the international remittance market where the transaction cost or fee is calculated at a high percent of transaction value. This suggests that a low transaction cost brings opportunities for business to attract customers by accepting Bitcoin as a mean of payment to avoid the high transaction fees associated with banks. It is estimated that cryptocurrency can reduce transaction fees by 8 to 20% (Alzahrani and Daim, 2019). Furthermore, based on sender's wish, an extra fee can be paid for faster transactions. The speed of a transaction depends on the amount of coins to be transferred; a higher amount would need higher priority.

### 2.9.4. SOCIAL FACTORS

Social factors are important since the impact of cryptocurrency technology on social structure can be substantial. These could include changes in social life and activity, changes in perceptions of society, as well as the effect of news and information. These criteria are assessed below.

#### 2.9.4.1. SN

SN are defined as a person's perception about social difficulty to manage a behaviour and it also described a person's decision in taking any actions (Ajzen, 1991). In other words, it is a perception that an individual has regarding whether others' believes can influence that individual's decision making. According to the study of Chang (1998), SN are a vital factor that have an impact on people's intentions. In this context, SN are studied as one of the factors related to the intention of society to invest in cryptocurrency.

Moreover, the social difficulty mentioned in Ajzen's definition of SN could relate to the influence of family and friends who are important to investors. Khairuddin and Sas (2017) found that some of their respondents invested in Bitcoin as they had been influenced by peers' and friends' information. In particular, if the relatives or close friends of investors profit from Bitcoin investment, then the investors would notice this and consider following their friends' investment approach.

The reason behind this is the FOMO and people tend to feel safe when they act according to social norms rather than being different. Furthermore, it is proved that SN has a positive effect on investment intention. Support from the people closest to millennial investors for investing in shares tends to increase the intention of millennial investors to trade in shares (Mahardhika and Zakiyah, 2020).

Thus, an individual's perceptions about investing in Bitcoin may be influenced by the behaviour of people around them. However, this could result in herding mentality where an individual blindly follows others' behaviour; an increase of investors following each other to invest in cryptocurrency could lead to a bubble.

#### 2.9.4.2. INFORMATIONAL MEDIA

The prices of cryptocurrency skyrocketed at the end of 2017 and beginning of 2018 (Hileman and Rauchs, 2017). The administrative efforts of governments around the world have brought massive attention to, and interest in, Bitcoin. There are no formal cryptocurrency laws or regulations worldwide. Cryptocurrency has also gained global attention through news posted by the press. Researchers have tested the influence of informational media (printed newspapers, television, the interest) on the behaviour of investors in cryptocurrency (Garcia et al., 2014). Lam (2018) showed that the ability to interpret information when making investment decisions is fundamental for Bitcoin investors. In the cryptocurrency market, dynamism and flexibility will help investors respond quickly to market movements; however, due to certain limitations of market awareness, this flexibility and dynamism could be easily diminished. Moreover, a lack of transparency in information media would prompt investors to behave in line with the crowd's behaviour, which might cause panic in the cryptocurrency market. Bitcoin investors need to be able to ascertain the reliability and credibility of the information they come across. Respondents in Craggs's (2017) research claimed that they relied on reliable financial and technology news websites; although respondents' views were likely to be skewed by printed news, the respondents shared that they were not overly influenced by news reports. On the other hand, discussion forums were claimed to be more truthful than cryptocurrency and technology websites (Craggs, 2017). Sharing the same school of thought, Khairuddin and Sas (2017) stated that the social aspect underpinning the initial motivation of Bitcoin's early investors included online communities where most of their respondents had first heard of Bitcoin.

### 2.9.5. GOVERNMENT FACTORS

Government influence is another important factor to consider. To avoid illegal activities, investors must consider government regulation in the operating nation to assess whether it is feasible to conduct any activities related to cryptocurrency.

Cryptocurrency is a decentralised currency and payment system that aims to remove the need for trusted authorities. It relies on a P2P network and cryptographic protocols to perform the roles of conventional financial intermediaries. Some policymakers and academics see cryptocurrencies as the driving force behind illegality and fraud and call for their strict control or even outright bans. Others warn that legislation could encourage trade practices to cross borders into less regulated jurisdictions.

Understanding how cryptocurrency investment behaviour reacts to regulation is valuable. It would provide insight into the impact of regulation on investors' investment activities; thus, a deeper understanding of the impact of regulation on cryptocurrency markets will demonstrate a general trend as emerging developments come into play and raise new regulatory issues.

#### 2.9.5.1. REGULATION

A previous article assessed how legislation influences the amount of trade, but only in a limited context. Nicola Borri and Kirill Shakhnov (2017) reviewed Chinese regulatory limits on cryptocurrencies in 2017. Throughout the year, China introduced a range of regulatory limits, which led to bans on ICOs and cryptocurrency exchanges in September 2017. Borri and Shakhnov (2017) found that these restrictions not only significantly reduced Chinese trade traffic but also created international spillover effects. Specifically, the number of Bitcoin transactions for Korean Won, Japanese Yen and US dollars increased greatly, which suggests that traders moved across borders. These findings indicate that the switching costs between cryptocurrency exchanges are reasonably low. In particular, when China imposed punitive regulations, investors relocated elsewhere. A majority decrease in trade traffic were recorded when a restriction of cryptocurrency trading imposed by Chinese government (Borria and Shaknov,

2017). Therefore, it can be concluded that regulation has a material effect on the country's cryptocurrency sector.

According to the work of Albayati et al. (2020), there are mutual and influential relationships between trust, regulatory support and expertise and these are strongly reflected in the adoption of blockchain technology. Government regulation has a direct impact on the trust of users in cryptocurrency transactions, thereby contributing to reducing risks related to cryptocurrency. Not to mention, the secure regulation increases the usage of blockchain-based applications. This could mean efficient and secure blockchain technology fosters users' trusts.

Based on Koenraadt and Leung's (2022) article, cryptocurrency token investors see regulation as advantageous because it reduces adverse selection problems in the emerging market. In other words, the requirement that cryptocurrency token issuers register their offerings with securities regulations and comply with mandatory disclosure requirements may increase the amount of price information available to investors. In addition, at secondary market level, legislation requiring cryptocurrency token exchanges to register with the relevant securities regulator may also improve investor security. However, cryptocurrency investors do not feel that regulation is essential. Bourveau et al. (2018) argued that a document that allows cryptocurrency token issuers to voluntarily disclose information to market participants to indicate their quality would reduce the need for disclosure regulations. Several cryptocurrency exchanges also voluntarily comply with strict licensing criteria.

#### 2.9.5.2. POLITICAL RISK

Investors' distrust in government, banks or financial institutions was captured to lead to an increase in Bitcoin investment. In some countries with political issues, the motivation to store cryptocurrency is quite high. In Libya, there is a downward movement in Libya's currency and its economy faces acute liquidity shortage (Harchaoui, 2018). Libyans are experiencing inflation and paying expensive prices for commodities; the banking system is plunging. Therefore, it leads to a

rise of demand for swapping currency from black market (Harchaoui, 2018). This issue provoked users to seek a "safer" source of acquiring money and it also urged the idea of adopting Bitcoin as a means of savings in a situation of inflation and economic downturn.

## 2.10. CHAPTER SUMMARY

To comprehend which factors affect millennial investors' perceptions of cryptocurrency investment, previous research and theories related to the attitude and behaviour of investors were collected to form a literature review for this study. In this chapter, the exploration of millennial investors' perceptions began with their profile, characteristics, investing behaviour and decision-making models. Different determinants correlated with investment strategy, attitude, behaviour and four main factors (i.e. economic, technological, social and governmental) affecting cryptocurrency investment are incorporated in the literature review.

Previous literature indicated that reliance on a single theory (TPB or TAM) would not yield an accurate outcome for this study due to the limitations of each model. TPB was constructed in 1991 and TAM was formed in 1989, which restricts their features when studying new technology, such as blockchain and cryptocurrency. To support this argument, TPB is claimed to have the capability to explain the behaviour of millennial investors in the stock market (Mahardhika and Zakiyah, 2020), but it is a unidirectional model in relation to understanding cryptocurrency investors' perceptions (Pour Doulati, 2016). Moreover, findings under TAM are not consistent and clear (Legris et al., 2003). Legris et al. (2003) argued that TAM is a useful model, however, it should be incorporated into a broader model that interprets human and social change processes. Therefore, this thesis adopts the two models for the theoretical framework along with the application of HDM as the integration of TPB and TAM could only improve the explanatory capacity of TAM by 2% (Taylor and Todd, 1995).

It was apparent from the literature review that studies about millennial investors in cryptocurrency were limited as most of the research focused on cryptocurrency users rather than cryptocurrency investment. However, it is clear that there are certain factors that are associated with the adoption of cryptocurrency investment. These factors including economic, technological and social factors.

From the literature review, the discussion on the factors related to cryptocurrency investment shows that economic factors posed the most influence on investors' perceptions. This could argue that investors seek to earn a higher return on cryptocurrency market in comparison to other markets because of cryptocurrency volatility. Some investors consider investing in Bitcoin as a means of gambling. Hence, earning a better return in the short time might be an advantage for gamblers. On the other hand, tech savvy investors would invest in Bitcoin because they are interested in blockchain and cryptocurrency technology. Anonymity and transaction transparency are the most favourable characteristics of Bitcoin.

The literature review highlighted the important link between attitude and behaviour of investors. The attitude and the perception of investors form their behaviour when investing in cryptocurrency. This chapter enabled a more complete understanding of the identified factors that could have an impact on millennial investors' perceptions of cryptocurrency investment. A conceptual framework was developed to understand different levels of decision making; this framework is illustrated in Figure 3.1.

# CHAPTER 3: CONCEPTUAL FRAMEWORK

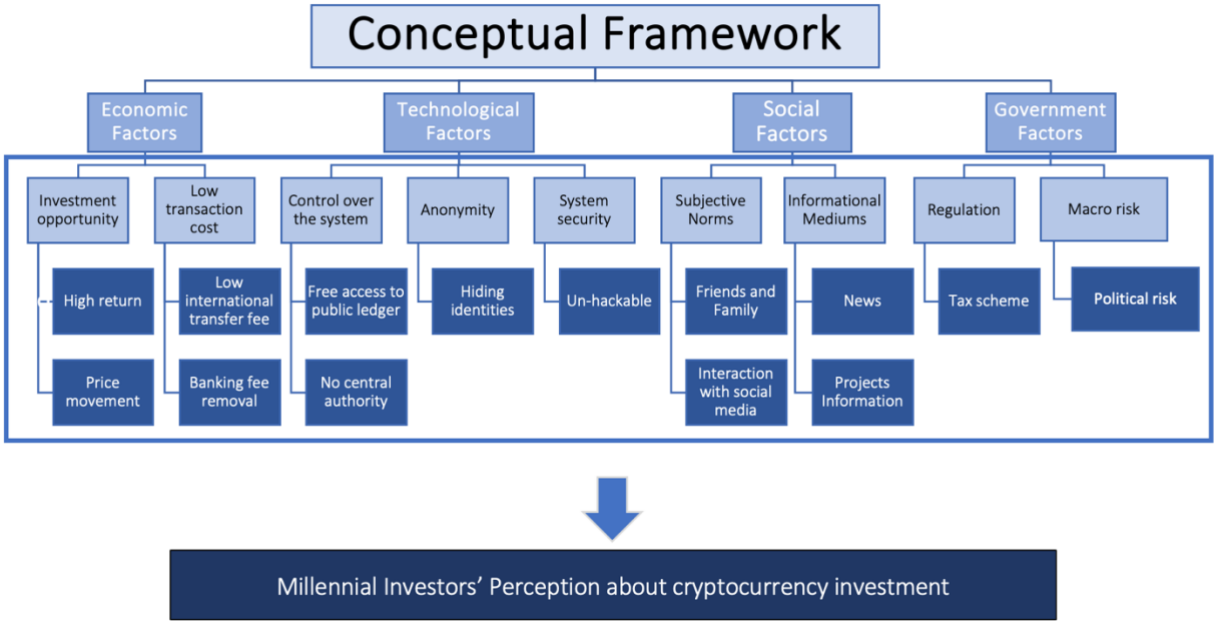


Figure 3.1. Conceptual framework – Source: from the research

## 3.1. INTRODUCTION

The literature review investigated and thoroughly analysed factors considered to influence millennial investors' perceptions of cryptocurrency as an investment. From these factors, a conceptual framework was developed based on the HDM model. As the number of measurements will be extremely large, if there are many levels in the framework, the author established six levels of decision-making process to evaluate each respondent's behaviour with the aim to obtain their goals and determinants that determine their behaviour towards cryptocurrency investment.

This model was utilised to assemble hypotheses that could be tested within the context of millennial investors who are currently investing in cryptocurrency. In the proposed conceptual

framework, millennial investors' perception of cryptocurrency as an investment is treated as the dependent variable. Whilst other factors (economic, technological, social and government factors) are part of the independent variables. For each factor, there are dimensions to provide explanation along with the main independent variables.

Based on the previous research described in the literature review, it is clear that economic factors are the most important element that influence cryptocurrency investors when making decisions (Alzahrani and Daim, 2019; Lammer et al., 2019; Kim et al., 2020). The next element is technological factors; fewer articles pointed out that investors' behaviour is affected by the technology in relation to cryptocurrency than the number of papers proposing that economic determinants are the most influential. In Alzahrani and Daim (2019), the ranking order of each element was economic factors, then technological factors and social factors, lastly, personal factors. For that reason, the factors examined in this paper will be ranked in this order – economic, technological, social and government – where government factors have not been researched in existing studies about the behaviour of cryptocurrency investors.

Moreover, most of the independent variables stated in the below sections have not been studied in the existing literature; thus, the author will rank each of the independent variables according to the main factor that they belong to, based on the information in the literature review.

## 3.2. ECONOMIC FACTORS

### 3.2.1. RELATIONSHIP BETWEEN HIGH RETURN AND INVESTORS' PERCEPTION

Cryptocurrency can be more profitable than most other investments. Cryptocurrency's liquidity is one of the primary characteristics that attracts investors. By their nature, cryptocurrencies have high liquidity as investors can buy and sell their coins easily and fast.

The literature indicates that return potential and liquidity are the major factors that motivate investors to invest in mutual funds (Singal and Manrai, 2018). Sharing a similar result, Sharma (2019) revealed that a fund's characteristics, such as high returns, tax benefits, liquidity and minimum initial investment, have a high impact on the perception of investors. In the context of the stock market, Obamuyi (2013) identified the socio-economic determinants influencing the investment decisions of Nigerian investors by employing a t-test. It showed that expected capital increases, bonus, expected corporate earnings and get-rich-quick schemes were found to be the most influential factors on investment decisions of investors in Nigeria. Moreover, it was also identified that investors who have a higher level of return expectation are likely to trade and obtain higher turnover (Apan et al., 2015).

Furthermore, the demand for Bitcoin is increasing, whereas the availability of new supply is shrinking, with the size of each block reduced by half. Indeed, unlike most other produced goods, the rate of supply of new Bitcoins cannot increase in response to spikes in demand. Therefore, the price of Bitcoin or other types of cryptocurrencies is volatile, which could create high returns for cryptocurrency investors. On the other hand, it has been proved that high return and liquidity affect investors' perceptions of investment and investment behaviour (Singal and Manrai, 2018; Sharma, 2019; Obamuyi, 2013); thus, there could be a relationship between high return and cryptocurrency investors' perceptions.

### 3.2.2. RELATIONSHIP BETWEEN PRICE MOVEMENT AND INVESTORS' PERCEPTION

It is claimed that there is a correlation between price volatility and investors' perception, however, the impact of price volatility on investors' perception and allocation decisions is minor (Weber et al., 2013; Bradbury et al., 2015; Merkle, 2018). A recent study provided evidence that investors evaluate the risk inherent in asset return distributions mostly according to the probability of incurring a loss. This evaluation is mainly based on market performance or historical price movement. Moreover, from a behavioural finance perspective, there is an ongoing debate about

whether individual biases and preferences are relevant to market prices or whether arbitrage prevents them from having an effect (Hirshleifer, 2015).

Nadeem et al. (2020) reported that investors' attitude towards money has a significant effect on their investment decisions in the stock market. Investment choices taken in terms of money depend on money behaviour, which is the outcome of the effect of money attitudes. Therefore, attitudes and perception related to money element can be considered an important factor influencing investors' decisions, as supported by Shih and Ke (2014). Additionally, Ungeheur and Weber (2020) stated that investors' perceptions and investment decisions are driven by the frequency of return and co-movement of stock prices.

In the stock market, stock performance measures the ability of a stock to decrease or increase the wealth of investors. Performance of a stock is indicated by price movement. Price movement is one of the most important pieces of information considered by investors while making an investment decision (Obamuyi, 2013). Supporting this point, a study using SEM to identify the determinant factors of investors' behaviour in investment decisions showed that financial information and macro factors had a significant positive effect on investors' intentions (Kotwani, 2018). The results also showed that the intentions of investors and financial information had a significant positive impact on investment decisions. It is interesting that financial information, particularly price movement, made a significant contribution to investors' intentions and investment decisions. Furthermore, research found that female stock market investors' perceived the price and term of an investment as more significant than male investors (Kotwani, 2018).

### 3.2.3. RELATIONSHIP BETWEEN LOW INTERNATIONAL TRANSFER FEE AND INVESTORS' PERCEPTION

Standard wire transfers and foreign currency purchases generally involve fees and exchange costs. In some poor African countries, the remittance fee for transferring money abroad is double the global average. However, since Bitcoin transactions have no intermediary institutions or

government involvement, the costs of transacting are kept very low in comparison to traditional banks or intermediaries. Additionally, any transfer in Bitcoins happens very quickly, which eliminates the inconvenience of typical authorisation requirements and wait periods. The speed at which the transaction is confirmed sometimes depends on the amount to be exchanged. The higher the amount, the higher the priority placed on the transaction, which leads to faster transfer. Cryptocurrency is expected to help users avoid the high cost of transactions.

In the study of Alzahrani and Daim (2019), a low transaction fee was one of the factors that impacted Bitcoin users' adoption of cryptocurrency; however, it is not one of the major variables that have a strong influence. Furthermore, participants in AlShamsi and Andras's (2019) study mentioned that the fast transaction process and "cheap money transfer" were the reasons they chose Bitcoin. Nonetheless, compared to other payment methods, such as credit or debit cards, Bitcoin is perceived to be less efficient despite the ability of Bitcoin systems to accept micropayments without transaction fees (AlShamsi and Andras, 2019).

### 3.2.4. RELATIONSHIP BETWEEN BANKING FEES REMOVAL AND INVESTORS' PERCEPTION

Banks collect fees for their services to personal and business customers. Customers are charged to open a deposit account or to maintain their bank accounts. In other instances, banks may impose service fees to perform transactions or as a penalty for occurrences such as bounced cheques. There are certain costs that apply across the board to all clients, whilst others may be eliminated on specific terms. Customers who have a long-term relationship with a bank and several assets and obligations may be eligible for a charge waiver.

The cost of banking was shown to have an impact on users' attitude (Jebran and Hossain, 2012). Jebran and Hossain (2012) focused on identifying key variables that affect consumers' perception of banking and services in Bangladesh. In addition to risks and trust, costs were considered a main factor that people were very aware of. Jebran and Hossain (2012) reported that banking fees have

a negative relationship with consumers' attitude in relation to consumers' adoption of banking services (Jebran and Hossain, 2012). This suggests that if there was no cost on financial services, users' adoption and engagement with institutional banking services would increase.

Cryptocurrency users or investors are not subjected to the traditional banking fees associated with fiat currencies. The implication is that cryptocurrency users or investors do not have to pay for maintenance of an account, minimum balance fees, overdraft charges or returned deposit fees. Cryptocurrency investors could avoid admin fees and fees related to banking. The removal of banking fees as a characteristic of cryptocurrency use could be hypothesised to be one of the main factors affecting investors' perceptions when adopting Bitcoin or other cryptocurrencies. Yet, there is a lack of evidence in the literature on the relationship between banking fees removal and investors' perceptions in the context of cryptocurrency investment; hence, this study will use mixed methods to test this relationship.

## 3.3. TECHNOLOGICAL FACTORS

### 3.3.1. RELATIONSHIP BETWEEN FREE ACCESS TO PUBLIC LEDGER AND INVESTORS' PERCEPTION

According to Sas and Khairuddin (2015), the most important characteristic of Bitcoin that motivated their interviewees to use it is decentralisation, which means the process is not controlled by a single authority and the database is consensually shared by multiple users. In other words, the application of permissionless public ledgers, which operate for any unknown or untrusted users with free access to the ledger, affected users' motivation for using Bitcoin. This result is in line with the work of Khairuddin et al. (2016), who found that decentralised technology, in particular, free access to a public ledger, is one of the main aspects empowering users of Bitcoin. The importance of freedom and an open-source platform is that they allow the source code to be made freely accessible, modified and redistributed. It was also pointed out that democratising technology access would potentially transform global financial institutions. Additionally, Abramova and Bohme (2016) studied the key determinants and inhibitors of Bitcoin use and reported that the

relationship between decentralisation and perceived benefit of Bitcoin was proved to have a significant effect on usage behaviour.

However, the factor of free access to a public ledger had the weakest effect on users' perception of Bitcoin (Abramova and Bohme, 2016). This contradicts the common claim of users in previous research that decentralisation and free access to a public ledger were the primary reasons for their adoption of Bitcoin (Sas and Khairuddin, 2015; Khairuddin et al., 2016; Krombholz et al., 2017). This inconsistency might be partly due to the participants' profiles; a lack of understanding of the intricate notion of decentralisation among less tech-savvy participants could have contributed to this inconsistency.

### 3.3.2. RELATIONSHIP BETWEEN NO CENTRAL AUTHORITY AND INVESTORS' PERCEPTION

Cryptocurrencies operate in a decentralised manner, which puts trust in the network of users. The decentralisation allows users to operate a higher level of transparency as all transactions are published in a public ledger and can be accessed by all users on the network.

Cryptocurrencies are neither issued nor regulated by a central government and therefore is not subject to governmental monetary policies. Cryptocurrency prices are primarily affected by its supply and the market's demand for it. For fiat money, countries without fixed foreign exchange rates can partially control how much of their currency circulates by adjusting the discount rate, changing reserve requirements or engaging in open-market operations. With these options, a central bank can potentially impact a currency's exchange rate.

From the perspective of users and investors, the interference of a central authority or corporate oversight might be hypothesised to transform their activities into data. Indeed, the content of transaction activities has become a site of value production for payment intermediaries. Kreimer

(2006) pointed out that payment intermediaries can effectively shut down an organisation by refusing to transfer funds to it. However, with cryptocurrency technology, corporate oversight is removed. In particular, intermediaries are kept from profiting from transaction fees and from invading transactors' privacy.

Notably, Bitcoin users clarified that having freedom and control over their finances were the main reasons why they adopted Bitcoin (Khairuddin et al., 2016). The sense of control with no third-party involvement has a positive correlation with perceived benefit for Bitcoin users, which is not the case with traditional currencies (Khairuddin et al., 2016). Furthermore, users' perceptions of Bitcoin usability and security in comparison to non-anonymous payment systems across novice users were studied (AlShamsi and Andras, 2019). They found that users' satisfaction with Bitcoin was significantly influenced by their perceptions of its usability. In particular, the absence of legal authority and no external control over transactions we found to have a great impact on users' perceptions of Bitcoin usability.

### 3.3.3. RELATIONSHIP BETWEEN HIDING IDENTITIES AND INVESTORS' PERCEPTION

Nakamoto proposed a "new privacy model" in which identities, but not transactions, are shielded from public view. Bitcoin transactions are recorded in a public ledger, but the anonymity of all the parties is secured using public-key encryption, which is a common technique in online commerce. All users and investors can use a pseudonym to trade and mine Bitcoin. This means their identity information is not attached to addresses that can be followed over time (Athey et al., 2016).

Krombholz et al. (2017) revealed that one-third of their respondents believed that Bitcoin is anonymous and others stated that they adopted Bitcoin for anonymity purposes. Therefore, having the ability to hide identities in the financial industry is a critical characteristic; cryptocurrency provides greater anonymity than the traditional banking system. This aligns with Shehhi et al.'s

(2014) research who identified the factors affect users' adoption of a cryptocurrency to mine or use. Besides presentation factors, such as currency name or logo, innovative factors, such as anonymity and privacy, were the main determinants that determined users' decision to adopt cryptocurrency.

### 3.3.4. RELATIONSHIP BETWEEN UNHACKABILITY AND INVESTORS' PERCEPTION

Security is considered a significant barrier for online users and can have a great influence on the use of online applications. It is claimed that user confidence in technology is greatly weakened if the technology is not supported by legal authority. Therefore, security could be a determinant of users' decisions to use e-payment systems. Bitcoin users might be less able to use protection effectively because Bitcoin is a novel decentralised digital currency and has some legality concerns (Coutu, 2014; Gao et al., 2016). Nevertheless, Bitcoin is relatively safe due to cryptography and robust protocols that are readily available through several exchanges. The security of a decentralised system built on verification by processing power increases the more open the system is and the larger the number of network members expending processing power on verification. Since it operates in a P2P network, a hack would require massive computing power which would almost be impossible to achieve (Alzahrani and Daim, 2019).

Previous researchers found that there was a relationship between users' or customers' perceptions of the security of, and their trust in a system and the technical protection mechanisms (Kim, 2021; Oney et al., 2017; Ooi et al., 2021). However, Ooi et al. (2021) and Kim (2021) reported that technical protection had a positive effect on users' perceived security, but could not significantly explain the perceived trust in using Bitcoin. Additionally, a security statement has an important effect on both users' perceived trust and perceived security (Hanzaee and Alinejad, 2012). This is comparable with Kim (2021) who found that perceived security is determined by security statements; similarly, Andrade et al. (2012) found that privacy statements and security signs affected trust. Ooi et al. (2021) suggested that a security statement is essential for Bitcoin as it is a significant determinant of Bitcoin users' perceived security and trust. In general, the adoption of

Bitcoin is influenced by security features. Therefore, this research tests whether the unhackability of Bitcoin has an impact on the perception of investors as well as on their decision to choose Bitcoin.

## 3.4. SOCIAL FACTORS

### 3.4.1. RELATIONSHIP BETWEEN FRIENDS AND FAMILY AND INVESTORS' PERCEPTION

Previous research showed that the speculative nature of cryptocurrency has increased the role of peer pressure (Krafft et al., 2018). Advice from friends and family has been described as an informal source of investment information (Stolper and Walter, 2017). In a research study about behavioural finance in portfolio investment decisions, Subash (2012) found that young investors seemed to give most importance to opinions of either friends or brokers. Indeed, nearly half of the young investors who participated in Subash's (2012) study claimed that they listened to friends when making investment decisions.

In the context of cryptocurrency, the influence of friends and family has an impact on investors' perception about cryptocurrency. Tangwattanarat (2018) studied Thai cryptocurrency investors' perceptions of digital currency; the scholar found that the majority of interviewees stated they learned about cryptocurrencies, mainly starting with Bitcoin, via friends, co-workers and family members. The primary takeaways from their friends or family were the rising market price and the future of technology and innovation. The respondents, who are Bitcoin users, in Alzahrani and Daim's (2019) study also stated that they were willing to adopt cryptocurrency if their peers adopted them.

Furthermore, investors with more experience in Bitcoin investment interact more with their friends than with other investors (Srikanjanasorn and Siripanich, 2020). In contrast, Abraham (2020) concluded that irrational investors buy Bitcoin based on social influencers or family and friends,

whilst Bitcoin's rational investors value the cryptocurrency through the performance of blockchain applications.

Nevertheless, according to the respondents in Craggs's (2017) research, social networks and friends/family/colleagues did not influence their cryptocurrency investment decisions because their social and family circle either did not use Bitcoin or were not well informed about Bitcoin enough for their advice to be valuable. This result supports the findings of Bashir et al.'s (2016) study, which reported that friendship networks were not an important predictor of Bitcoin attitudes among users.

From a broader view, the influence of friends and family not only impacts investors' perceptions of Bitcoin, but it could also drive their behaviour when making an investment decision. When assessing the role of psychological and social factors in the decision making of investors mediated by risk perception, Moueed and Hunjra (2019) found that social factors – friends, family and relatives – play a significant role in investors' decision making. Nonetheless, information extracted from family or from social interaction from friends could lead investors to make poor decisions (Moueed and Hunjra, 2019).

Therefore, due to conflicts in the conclusions of previous research, the author further investigates the effect of friends' and family's influences on millennial investors' decision about investing in Bitcoin.

### 3.4.2. RELATIONSHIP BETWEEN INTERACTION WITH SOCIAL MEDIA AND INVESTORS' PERCEPTION

Social commerce, which is an internet-based commercial application using social media and Web 2.0 technologies that promote social interaction and user-generated content to help users decide about, or acquire, products, has been proved to have an impact on the behavioural intention to use

cryptocurrency with the mediation of perceived trust (Paschalie and Santoso, 2020). Through social media, especially a cryptocurrency forum, users obtain emotional and informational value that encourages them to participate in the community. Mendoza-Tello et al. (2018) reported that social commerce usage increases perceived trust among cryptocurrency users.

Interestingly, Mendoza-Tello et al. (2018) revealed that interpersonal relationships give rise to social support (i.e., a person is cared for and gets assistance from their social groups). Previous research stated that users receiving social support are confident that their queries will be answered and they will be supported by a group of people if the need arises (Cobb, 1976). Bai et al. (2015) advocated that social support reduces perceptions of uncertainty and risk associated with the use of a particular technology. Support received from a group of people affects the behavioural intention of an individual to use cryptocurrency for e-payments (Mendoza-Tello et al., 2018). Hajli et al. (2017) argued that online forums, communities, ratings and reviews have an impact on users' perceptions. A potential user is more likely to adopt or to buy because of the platform's social commerce side.

Furthermore, people using Bitcoin use information gained from discussion forums and consider the information more trustworthy than other Bitcoin-related news websites (Craggs, 2017). Moreover, some well-known Bitcoin communities are regularly called upon by news agencies and conferences to pass comment or judgement on various cryptocurrency aspects. However, these one-way interactions differ from two-way interactions within an active discussion. Therefore, it can clearly be seen that a cryptocurrency forum discussion or information extracted from the forum would have a significant impact on users' behaviour. Nevertheless, in this thesis, the author aims to identify what factors in the social dimension would determine investors' perceptions of investing in cryptocurrency; hence, as a forum about cryptocurrency is proved to have major influences on users' behaviour and Bitcoin price, it is considered to be one of the main determinants in this thesis.

### 3.4.3. RELATIONSHIP BETWEEN NEWS AND INVESTORS' PERCEPTION

Media coverage, speculation and the availability of Bitcoin are some of the major causes of the fluctuation of Bitcoin's price. The price of Bitcoin drops as the volume sold on the market grows. Bitcoin's price will rise as more institutions use it as an investment and medium of exchange. For that reason, cryptocurrency investors and users might react to news; for example, users might sell their coins if there is negative press because it drives down the price. This assumption is based on the key findings in Tangwattanarat's (2018) paper, which stated that the main determinant that influences Thai investors to invest in cryptocurrency market is positive news from social media.

On the other hand, news from trustworthy sources might not be considered by cryptocurrency investors. Craggs (2017) reported that the more trusted a medium becomes the less respondents tended to use it. Respondents "were not overly influenced by news reporting as demonstrably news reporting is an important medium for information surrounding Bitcoin, second only to discussion forums" (Craggs, 2017, p. 63). In contrast, news from a general news website, technology websites and printed newspapers was shown to have a positive relationship with cryptocurrency investors' attitude (Craggs, 2017).

Zhang et al. (2019) studied how Chinese cryptocurrency investors express confirmatory bias when processing news; they found that there is a significant correlation between authority-related news and investors' behaviour. Additionally, Zhang et al. (2019) found that an abnormal trading volume was significantly higher for authority-related news with higher readability, which suggests that investors respond to the more readable authority-related news with more trading behaviour. Moreover, comparing experienced investors with younger investors in the Indian stock market, Subash (2012) found that the views expressed by popular analysts, news channels and newspapers were likely to have a stronger impact on the experienced investors. The main reason why experienced investors were biased towards news is they have more time to follow financial news (Subash, 2012).

The findings of Zhang et al. (2019), Tangwattanarat (2018) and Subash (2012) indicated that attitude to news significantly affects investors' behaviour in adopting cryptocurrency investment. However, Craggs (2017) showed that news does not necessarily have an influence on the

perception and behaviour of cryptocurrency investors. Due to the conflicting findings of previous literature, this paper will examine the correlation between news and the adoption of Bitcoin among millennial investors to test which source and characteristics of news would exert the strongest influence on millennial investors.

### 3.4.4. RELATIONSHIP BETWEEN PROJECT INFORMATION AND INVESTORS' PERCEPTION

According to Chod and Lyandres (2018), information asymmetry is the central issue affecting investor trust and the success of any kind of fundraising activity. Information asymmetry may be successfully eased in conventional fundraising operations such as initial public offerings and venture capital by thorough supervision and regulation, since disclosure regulation and enforcement are regarded as the cornerstones of well-functioning capital markets (Bourveau et al., 2018). Moreover, if there is a significant information asymmetry, then prospective investors' behaviour will be determined by how issuers convey signals to attract additional investors (Courtney et al., 2016).

In the context of this thesis, understanding about the project behind an ICO would help investors to make a right decision. Cryptocurrency investors will assess and collect information from the white paper, which provides brief information on concepts and problems with certain cryptocurrencies, before investing in a new coin. White papers are documents published by the issuers of crypto tokens that introduce the new tokens to potential investors (Zhang, 2019). In the absence of government regulation, white papers are the primary sources of information for potential investors, since the issuers have no obligation to disclose any information about themselves.

Based on in-depth interviews, white papers were concluded to be one of the main factors affecting Tangwattanarat's (2018) interviewees' initial investment in the cryptocurrency market; it was stated that a white paper is the most important source of information for investors making an

investment choice. In general, investors assessed how the currency works, the objectives of the ICO, how to distribute and manage money once the ICO is successfully launched, and who the inventor is. They will invest in the currency if all of these components are reliable, and success is possible. However, Tangwattanarat (2018) showed that the white paper was significant for a small number of investors who are long-term investors who follow technology-based information.

Additionally, Zetzsche et al. (2019) suggested that more than half of the white papers on the market do not disclose project contact details and an even higher number of white papers do not provide any underlying suitable legal support or compelling audit. Furthermore, white papers are often designed in a euphemistic way to lure investors; consequently, investors cannot trust a white paper due to its lack of proven track record of ICO start-up and lack of corporate governance and regulations.

Currently, there is only one specific research study (Tangwattanarat, 2018) confirming the impact of digital information from a white paper on the investment decision of cryptocurrency investors. Therefore, the author would like to test the causal link between projects information and millennial investors' perception and investment behaviour towards cryptocurrency.

## 3.5. GOVERNMENT FACTORS

### 3.5.1. RELATIONSHIP BETWEEN TAX SCHEME AND INVESTORS' PERCEPTION

In global connected financial markets, investors may react differently to the tax system of each country. This is demonstrated in a number of research studies that examined the relationship between tax scheme and the perception of investors (Meyer et al., 2014; Jeong and Choi, 2019; Coşkun and Bekçioglu, 2018; Thulasipriya, 2015; Ul-Hameed et al., 2019; Rao, 2020).

Meyer et al. (2014) declared that the introduction of a financial transaction tax had a significant impact on investor behaviour in France. In particular, a financial transaction tax had a strong impact on trading behaviour in the affected stocks, which influenced investors' decision in the stock market. Coşkun and Bekçioglu (2018) drew the same conclusion in their testing of the influence of taxation on the financial decisions of Turkish business investors based on the Tax Incentive Law. Furthermore, government employees' investment preferences are investment with tax benefit, high return and liquidity (Thulasipriya, 2015). In addition, when applying quantitative research and cross-sectional research, Ul-Hameed et al. (2019) found that tax benefit is one of the key factors influencing investors' perception of investing in mutual funds. Likewise, not only tax benefit, but also diversification of portfolio, are the main factors attracting investors to invest in a mutual funds (Rao, 2020).

In the case of cryptocurrency, there has been a lack of research investigating the correlation between tax and investors' perception. Moreover, there is a critical issue because each country has its own legal framework, and each government has a unique viewpoint on taxes and regulation of cryptocurrencies.

Litwack (2015) analysed the taxation of cryptocurrencies in US. suggested that cryptocurrencies can be classified as both asset and currency. In the same way, Wiseman (2016) criticised the Internal Revenue Service's decision that adopts Bitcoin as a property.

In France, profits from cryptocurrency speculation and mining are subject to a progressive income tax schedule (Hacioglu, 2019). For companies, profits from cryptocurrencies are liable to tax under the general corporation tax regime. There is no specific VAT law of cryptocurrencies and no transfer taxes are payable in France on cryptocurrencies. Moreover, cryptocurrencies portfolios are not taxable assets under the new French real estate wealth tax.

In another European country, Austria, individuals who make speculative transactions with cryptocurrencies are taxed up to one year, but their income is not taxed after a one-year period. If

individuals in the UK hold cryptocurrencies for investment, then this investment is considered an asset and the gains to be derived are subject to capital gains taxation; trade in cryptocurrencies is taxed as income on an individual's profits.

On the other hand, cryptocurrency is not taxed if it is used as a means of payment in Japan and Australia (Bondarenko et al., 2019). In other countries, such as Russia, the system of regulation and taxation of cryptocurrency investment is not developed (Bondarenko et al., 2019).

Therefore, in this thesis, the author intends to gain further knowledge of millennial investors' perception and behaviour in cryptocurrency by testing the impact of tax schemes on their investment perception.

### 3.5.2. RELATIONSHIP BETWEEN POLITICAL RISK AND INVESTORS' PERCEPTION

The political risk associated with national currencies can also impact the price of Bitcoin, as many people use it to hedge against currency price changes or to swiftly shift significant sums of value out of a country or currency.

Following Greece's economic crisis in 2015, there were indications of increasing Bitcoin purchases by Greek people seeking to preserve their valuables. Fear of the British referendum on leaving the EU (Brexit) in 2016 resulted in a surge in the price of Bitcoin with a fall in the value of the British pound (Trinh and Cameron, 2017). The same effect was recognised after Donald Trump's election as President of the US, that is, the price of Bitcoin skyrocketed for two months (Ajmi and Arfaoui, 2020). When the political environment deteriorates following an election, quantile plots demonstrate that a rise in the political risk index results in a significant increase in Bitcoin return, but Bitcoin volatility remains relatively steady (Ajmi and Arfaoui, 2020). In those events, the

phenomenon occurred due to the rise in demand for Bitcoin as investors utilised it to hedge against the deterioration of the political situation.

In the stock market, a company's stock price typically reflects investors' perception of its ability to earn and grow profits. Therefore, the price of Bitcoin or other cryptocurrencies could indicate the perception of investors at the captured moment, and it might determine their behaviours in the cryptocurrency market.

Restrepo et al. (2012) analysed different definitions and expressions of political risk and proposed a broad and more inclusive definition regarding its origins and effects. They showed that political risk affects corporate investment decisions; different expressions of political risk may influence both positively and negatively the value of investment opportunities and the decisions of firms to invest. Hence, there is a relationship between political risk and investors' perception.

Nevertheless, the correlation between political risk and cryptocurrency investors' behaviour in adopting Bitcoin has not been examined. Existing research pointed out that investors took actions according to the political risk, but could not state whether there is a relationship between the two aspects. For this reason, this paper will test whether political risk has an impact on millennial investors' perception of cryptocurrency investment and will test whether this relationship affects the behaviour of millennial investors in the cryptocurrency market.

## 3.6. CHAPTER SUMMARY

This chapter produced a conceptual framework that sufficiently includes six levels of decision-making process, independent variables and dependent variables to study millennial investors' perception of cryptocurrency investment and how their investing behaviour is influenced by their perceptions. The presented conceptual framework is built based on Kocaoglu's (2016) model, which combines different areas related to cryptocurrency investment and characteristics of

cryptocurrency, along with psychological aspects derived from TPB and TAM theory. The combination of TPB and TAM theory and the incorporation of the HDM model has created a contribution to knowledge with an in-depth framework about millennial cryptocurrency investors' perception and behaviour. Indeed, millennial investors' perception of cryptocurrency investment has not been extensively addressed from the view of technology and external factors, such as government impacts. Moreover, the variables were classified under each dimension that provide a specific direction to assess the overall context of this study. In this study, the main factors are economic, technological, social and government, and the main dimensions are investment opportunity, low transaction cost, control over the system, anonymity, SN, informational media, regulation and macro risk.

In addition, the conceptual framework has significantly contributed towards the formulation of hypothesis statements.

## 3.7. HYPOTHESES

Based on the literature review and the conceptual framework of the main factors' influence on investors' perception and behaviour towards cryptocurrency investment, directional hypotheses were developed to describe the causal link between fundamental factors and millennial investors' perception and investment behaviour towards cryptocurrency investment. These hypotheses utilise every factor that has been identified to impact millennial investors' perceptions in the literature review of the present research. The list below shows the directional hypotheses that were formulated.

H1: Economic factors have the greatest influence on millennial investors' perceptions of cryptocurrency investment.

H2: Government factors have the least influence on millennial investors' perceptions of cryptocurrency investment.

H3: There is a significant relationship between high return and millennial investors' perceptions of cryptocurrency investment.

H4: There is a significant relationship between price movement and millennial investors' perceptions of cryptocurrency investment.

H5: There is a significant relationship between low international transaction fee and millennial investors' perceptions of cryptocurrency investment.

H6: There is a significant relationship between banking fee removal and millennial investors' perceptions of cryptocurrency investment.

H7: There is a significant relationship between free access to public ledger and millennial investors' perceptions of cryptocurrency investment.

H8: There is a significant relationship between no central authority and millennial investors' perceptions of cryptocurrency investment.

H9: There is a significant relationship between hiding identities and millennial investors' perceptions of cryptocurrency investment.

H10: There is a significant relationship between unhackability and millennial investors' perceptions of cryptocurrency investment.

H11: There is a significant relationship between friends and family and millennial investors' perceptions of cryptocurrency investment.

H12: There is a significant relationship between interaction in cryptocurrency social commerce and millennial investors' perceptions of cryptocurrency investment.

H13: There is a significant relationship between news and millennial investors' perceptions of cryptocurrency investment.

H14: There is a significant relationship between white paper and millennial investors' perceptions of cryptocurrency investment.

H15: There is a significant relationship between tax scheme and millennial investors' perceptions of cryptocurrency investment.

H16: There is a significant relationship between political risk and millennial investors' perceptions of cryptocurrency investment.

# CHAPTER 4: METHODOLOGY

## 4.1. INTRODUCTION

The term "methodology" refers to the research logic employed by a researcher in a specific project, including basic subject and research method knowledge and the framework used in a particular context (Flick, 2015). After conducting a systematic literature review and developing a theoretical framework, the next step in this research study is to provide a comprehensive explanation of how the research was conducted and analysed. Consequently, the purpose of this chapter is to provide the reader with an understanding of the methodology utilised in this research study in order to test the theoretical framework regarding how millennial investors perceive cryptocurrency as an investment method.

The chapter begins with a discussion of the research philosophy, methods, and strategies employed, as well as their selection criteria. Second, the chapter describes the suggested research design followed in the current study, including research phases and process, as well as data collection instruments and analysis. The chapter concludes with a discussion of the ethical considerations involved in data collection.

## 4.2. RESEARCH PARADIGM

A research paradigm defines the researcher's worldview, which constitutes the abstract beliefs and principles that shape how a researcher interacts with and sees the world. It is the conceptual prism through which the researcher evaluates the methodological components of their research endeavour to establish the research methodologies to be employed and the data analysis procedures to be followed. The pioneers in the field, Guba and Lincoln (1994), stated that a paradigm was a fundamental set of beliefs or worldview that governs research activity or examination.

Guba and Lincoln (1985) defined a paradigm as having four components: ontology, epistemology, axiology and methodology. It is critical to have a strong grasp of these parts since they contain each paradigm's fundamental assumptions, beliefs, norms and values. In the sections below, ontology, epistemology and axiology are defined and the author will apply each component of a paradigm to obtain the appropriate philosophy for this research.

### 4.2.1. ONTOLOGY

Ontology is a term that comes from the discipline of philosophy. It is used to define the natural links between objects as well as the intrinsically concealed relationships between their constituents. In other words, it is a term used in research to describe a researcher's ideas about the nature of reality.

To ensure the validity of a social science research study, clarification of well-constructed concepts and techniques from the conceptual framework and ontology are crucial (Lukyanenko et al., 2019). Ontology allows the author to explore their underlying belief system and philosophical assumptions about the nature of being, existence and reality. Philosophical beliefs regarding the nature of reality are critical to comprehending how the researcher interprets collected data.

### 4.2.2. EPISTEMOLOGY

According to Guba and Lincoln (1994), epistemological assumptions are concerned with the basic foundations of knowledge – its nature, forms, acquisition and transmission to other human beings. It is concerned with the nature of human knowledge and comprehension that a researcher may gain in order to extend and deepen understanding in the field of study. As cited in Rehman and Alharthi

(2016, p.52), the epistemological question is what prompts a researcher to consider "the potential and desirability of objectivity, subjectivity, causation, validity, and generalisability" (Patton, 2002, p.134). Epistemology aids in determining whether or not the researcher has had an impact on the results of the study. Consequently, the next section of this thesis discusses axiology as required for this research in the context of the preceding section of the study.

### 4.2.3. AXIOLOGY

The nature of ethical behaviour is the subject of axiology. This concept derives from the Greek word, axios, which means value. Under an academic context, axiology refers to what the researcher feels to be valuable and ethical, which influences a researcher's decision-making process. According to Biddle and Schafft (2015), most researchers, regardless of their preferred technique of inquiry, would agree that axiology has a significant influence on the selection and formulation of research topics, directing their attention towards certain concerns. Social science researchers display varied degrees of involvement with axiological concerns, depending on the norms of their specific research group and personal convictions. It is important to strike a balance between the aim of the investigation, what the research values and other ethical issues.

## 4.3 RESEARCH PHILOSOPHY

In a research study, the philosophy postulates an all-encompassing view of the researcher's assumptions about the study. It is essential for a researcher to cultivate the skill of reflexivity by frequently scrutinising their own beliefs or hypotheses as they would scrutinise the beliefs of others. Moreover, each philosophy corresponds with a particular research problem and assumption, which makes an exclusive contribution to the organisational world. Additionally, research philosophies can be diverse according to where their presumptions are located on the objectivism or subjectivism continuum.

For this thesis, the research philosophy will follow subjectivism as the researcher is interested in different opinions, perceptions and narratives, which can help to account for different social realities of different social actors. Millennial investors are social actors, who explain the situations in which they find themselves differently as a consequence of their own view about cryptocurrency investment. Their understandings are likely to influence their behaviour and the nature of their social interaction with others. In other words, subjectivism requires a nominalist ontology involving public problems that are organised via awareness and subsequent activities of public actors. The epistemology of subjectivism concentrates on the social actors' beliefs, stories and interpretations that transfer these public facts and declares a value-bound, pensive axiology.

Moreover, the choice of research philosophy is affected by practical implications. As a subjectivist researcher, the author seeks to understand the different realities of the stakeholders to understand their motives, behaviour and purpose in cryptocurrency investment.

There are five major philosophies namely positivism, critical realism, interpretivism, postmodernism and pragmatism. The ontological assumption for positivism is there is a single reality and the main argument for positivism is that the social world exists externally to the researcher and can be measured through observations (Gray, 2018). While critical realism focuses on explaining the observation and experience of the researcher as critical realists see reality as external and independent (Saunders et al., 2016). Meanwhile, interpretivism places an importance on the need to explore the subjective meanings motivating people and their actions to gain understanding. Interpretivists hold a view that reality is constructed by social actors (Wahyuni, 2012). Postmodernism emphasises the role of language, power relations, questioning accepted ways of thinking and giving voice to alternative marginalised views (Saunders et al., 2016). Postmodernists would challenge organisational concepts and theories, and seek to demonstrate what realities they exclude.

In Table 4.1., the five main philosophies are compared based on their paradigm.

| **Philosophy** | **Ontology** | **Epistemology** | **Axiology** |
|---|---|---|---|
| Positivism | - Facts are acquired rather than impressions to serve as the basis for further hypothesis testing.<br>- There is a single reality | - Uncovering observable and quantifiable facts are prioritised<br>- Causal links are established to generate law-like generalisations (Gill and Johnson, 2010) | - An objective and detached relationship with the research and data in order to prevent biassing the study's conclusions (Saunders et al., 2016).<br>- Value-free research should be considered |
| Critical realism | - Reality is viewed as external and autonomous, yet inaccessible directly through observation and knowledge.<br>(Saunders et al., 2016; Fleetwood, 2005) | - Critical realists support epistemic relativism as part of their focus on historical study of structure (Reed, 2005) | - Stems from the realisation that our knowledge of reality is the consequence of social conditioning that cannot be understood without considering the social actors involved (Saunders et al., 2016) |
| Interpretivism | - Interpretivism is clearly subjectivist in its emphasis on complexity, richness and various interpretations | - In particular, interpretivists focus on narratives, perceptions and interpretations (Saunders et al., 2016) | - The interpretivist philosophy requires the researcher to have an empathic perspective. However, interpretivism involves value-bound research |
| Postmodernism | - Postmodernism emphasises the role of language, power relations, questioning accepted ways of thinking, | - Postmodernists seek to bring to light what has been omitted or ignored through the deconstruction of what | - Postmodernism is value-constituted research. Fundamental is the recognition that power relations between |

| | | | |
|---|---|---|---|
| | and giving voice to alternative marginalised views (Saunders et al., 2016) | constitutes "reality" into the ideologies and power relations that support it, much like one might demolish an old structure into its bricks and mortar (Saunder et al., 2016) | the researcher and research subjects shape the knowledge created as part of the research process (Saunders et al., 2016) |
| Pragmatism | - Morgan (2014) asserted that pragmatism focuses on the nature of experience than reality comparing to other philosophies. | - Pragmatists are more interested in practical outcomes than abstract distinctions | - The reflexive process of inquiry, which is triggered by doubt and a sensation that something is wrong or out of place, is driven by researcher values (Saunders et al., 2016) |

Table 4.1. Five main philosophies – Source: from the research

From the five main philosophies in business and management research – positivism, critical realism, interpretivism, postmodernism and pragmatism – this paper adopts pragmatism as the research philosophy. In comparison to other philosophies, pragmatists believe that the process of acquiring knowledge is a continuum rather than two opposing and mutually exclusive poles of objectivity and subjectivity. This characteristic is unlike that of positivistic researchers, who assert objective knowledge gained through empirical evidence and hypothesis testing; and constructivists, who argue that knowledge is relative, and reality is overly complex. In terms of style of inquiry, pragmatism is thus located somewhere in the centre of the paradigm continuum. Post-positivism often favours quantitative techniques and logical reasoning, whereas constructivism favours qualitative approaches and inductive reasoning; nevertheless, pragmatism accepts both extremes and provides a more flexible and reflective approach to study design (Feilzer, 2010). By taking this attitude, the pragmatic researcher is able to choose the best appropriate research design and technique to meet the study's issue. Pragmatism is commonly connected with abductive thinking

that alternates between deduction and induction. In this method, the researcher is actively involved in the generation of data and theories (Goldkuhl, 2012).

### 4.3.1. JUSTIFICATION FOR CHOOSING PRAGMATISM

The decision to utilise pragmatism as an overall philosophical perspective was heavily motivated by this research's aims to give relevant and actionable information rooted in respondents' experience about cryptocurrency investment. The author is able to inform and refine the research objectives by analysing both theoretical and grey literature for knowledge gaps related to investors' perception and behaviour in relation to cryptocurrency.

Pragmatism was introduced by Charles Pierce and his colleague, William James, in the US in 1870 (Saunders et al., 2016). The philosophy aims to harmonise not only subjectivism and objectivism, truth, reality and values as well as knowledge, and to be stringent and precise. In the view of a research paradigm, pragmatism is concerned with resolving practical issues in the actual world. For pragmatists, an investigation is useful only if it accomplishes its objectives, whether in social life or social work research (Hothersall, 2018).

In relation to epistemology, facts are considered as practical impacts of concepts and knowledge is considered for authorizing activities. This thesis aims to examine the practical meaning of humans' attitude and behaviour in a cryptocurrency investment context through testing the interaction of millennial investors with cryptocurrency and identifying the drives for adoption and investment in the cryptocurrency market. The reason for selecting pragmatism was mainly related to the fact that pragmatism presents a deeper and more realistic understanding of human behaviour (Farjoun et al., 2015). There are numerous angles from which to interpret the world under pragmatism, as no single perspective can provide the entire picture and there may be various realities.

Ontologically, pragmatism focuses on the nature of experience, rather than reality, in comparison to other philosophies (Morgan, 2014). This means pragmatism's ontology is a universe of identical human experiences and there are valid beliefs that take shape when we repeatedly act in comparable situations. This sheds light for the author to identify the possible transferability of the study's findings and enhance the relevance of existing studies about cryptocurrency.

Moreover, being a pragmatist means a researcher is more interested in feasible results than in abstract distinction, which indicates that their research outcome might have noticeable differences from the outcomes of subjectivists' and objectivists' research. Accordingly, from the axiological point of view, the author pinpoints the purpose and incentives of cryptocurrency use for millennial investors that creates practical outcomes for future research. Therefore, establishing a value-driven research, this thesis strives to facilitate the development of both theoretical and practical visions about cryptocurrency investment to promote social changes related to cryptocurrency. Additionally, pragmatism opposes the conventional philosophical dualism of objectivity and subjectivity (Biesta, 2010), which frees the researcher from the imposed dichotomies of post-positivism and constructivism (Creswell and Plano, 2011). For this reason, the choice of pairing subjectivism with pragmatism for this research might not pose any drawbacks.

On the other hand, pragmatism allows the researcher to perform the study using the most appropriate method to answer the research topic, it also requires a thorough grasp of research procedures. Because of the absence of prescription in the research, the choice of a pragmatic technique was difficult, which resulted in a significant quantity of additional reading and thought. This resulted in a considerable delay in formalising the study, as much more reading time needed to be included, which caused a great deal of aggravation for a beginner researcher who simply wanted to get started. The concept of autonomy within the research was useful, but it needed trust; trust that employing a pragmatic technique was a valid option that could be adequately justified.

To conclude, in conjunction with the benefits of pragmatism, this adoption of philosophy led towards the comprehensive evaluation of literature about TPB, TAM and investors' behaviour in investment. In particular, the perceptions of a person could affect their attitude, which could also

lead to behaviour in special circumstances; this meant that millennial investors' perceptions could affect their attitude and behaviour in the cryptocurrency market. In terms of methodological choices, being a pragmatist meant that mixed methods were applied, and it also influenced the tactics of this study in regard to the sample. Additionally, this philosophical approach aids the author to unpack the study's challenges and tailor the interview questions that were deemed most valuable for this research.

## 4.4. RESEARCH APPROACH

The selection of research approach is a crucial part of a research study as it reflects a systematic method applied by the author that assists in verifying research objectives and hypotheses. There are three main approaches to theory development: deduction, induction and abduction. The deductive approach refers to research that starts with a theory, which is developed based on the academic literature, and the researcher outlines a strategy to test the theory. On the other hand, the method of obtaining data to discover a phenomenon to establish a research study before arriving at an appropriate theory is called induction. Last, but not least, if a research study starts with collecting data to identify a research problem and to explain models with the aim to achieve a new theory or to modify an existing theory, then this approach would be abduction. In this thesis, the author adopts abduction as the approach to theory development because of its relevancy to the thesis's methodology.

The combination of abductive reasoning and pragmatism was shown to generate meaningful information and serves as a basis for rigorous research (Mitchell, 2018; Goldkuhl, 2012). Abductive reasoning follows a pragmatist perspective in which incomplete observations from experience and reality are taken that may then lead to a best prediction of the truth or new theory. Furthermore, Dudovskiy (2016) proved that abductive reasoning can address some of the weaknesses traditionally associated with deductive and inductive approaches by adopting a pragmatist perspective. Moreover, by employing an abductive approach with pragmatism philosophy, the author could freely move back and forth between theories and findings to explain the facts related to millennial investors' perception and behaviour in relation to cryptocurrency.

## 4.5. MIXED METHODS

The rise of mixed methods since it first formed in the late 1980s has proved its value in many fields of study (Creswell et al., 2020). Mixed methods are a combination of qualitative and quantitative methods in response to research questions or hypotheses. This includes rigorous methods of data collection, analysis and interpretation from both qualitative and quantitative method (Creswell et al., 2020). Thanks to this characteristic, mixed methods help researchers draw strengths from both qualitative and quantitative research as well as minimise the limitations of both approaches.

### 4.5.1. PROS AND CONS

The main advantage of mixed methods is the flexibility offered to researchers when analysing and drawing conclusions for their study (Marshall and Rossman, 2014). With mixed methods, diverse perspectives can be taken using quantitative and qualitative approaches, which will help the author understand the current research problems and questions. It increases the findings' reliability and credibility as some researchers may face difficulties in reaching respondents due to the sensitivity of the topic. This point was raised by Johnson et al. (2007) who showed that mixed methods work for the purposes of breadth and depth of understanding. Furthermore, Creswell et al. (2020) argued that researchers using mixed methods developed better contextualised measurement instruments by first collecting and analysing qualitative data, then administering the instruments to a sample. However, mixed methods also pose challenges to researchers. As it is a mixture of two methods, it requires extensive data collection and it takes longer to analyse both qualitative and quantitative data.

### 4.5.2. JUSTIFICATION FOR CHOOSING MIXED METHODS

The aim of the use of a mixed methods approach in this thesis is to draw from the strengths of each method and to minimise the weaknesses of one single approach. A single-approach design might only include experiments to determine cause and effect regarding a specific issue. Conversely, it might only use observation to tell the story of why a problem has arisen. Moreover, mixed methods offer a statistical analysis along with observation that makes the research more comprehensive.

Additionally, being a pragmatist means the researcher focuses mainly on the practical outcome and experience of the observants. Therefore, pairing mixed methods with pragmatism in this thesis would support the author to draw out appropriate conclusions. Numerous research studies have shown that the practical aspect of pragmatism is emphasised when combined with mixed methods (Morgan, 2014; Onwuebuzie and Johnson, 2014; Mitchell, 2018). Moreover, according to Brierley (2017), the combination of pragmatism and mixed methods allows the author to be flexible in the choice of methods to answer research questions. In this thesis, this approach enables the author to gather broader and deeper knowledge about millennial investors' traits in cryptocurrency investment, how they value different sources of information, and understanding of how their perception changes due to influences. Besides, cryptocurrency investment is considered a sensitive topic; it is difficult to find respondents because users and investors favour anonymity. Hence, adopting mixed methods in this research not only broadens access to respondents, but also increases the study's reliability and credibility through the diverse evidence given in the results. Nevertheless, mixed methods raise challenges in sampling and it is time consuming.

It is important to consider the type of mixed methods design as it determines the quality of the study's results. Therefore, in the next section, the author presents the appropriate design for mixed methods.

### 4.5.3. MIXED METHODS DESIGN

There are three types of mixed methods designs: sequential explanatory, sequential exploratory and concurrent convergent. With sequential explanatory, first, quantitative data are collected then

the findings inform qualitative data collection and analysis (Creswell et al., 2014). On the other hand, in sequential exploratory design, researchers would first collect and interpret qualitative data, and these findings inform subsequent quantitative data collection (Onwuegbuzie et al., 2010). For the concurrent convergent approach, qualitative and quantitative data are collected and analysed during the same time frame. During this time frame, an interactive approach may be used where data collection and analysis drive changes in the data collection procedures.

### 4.5.4. EXPLORATORY RESEARCH

For this thesis, the chosen design is sequential exploratory. Firstly, exploratory research offers a great amount of discretion to the researcher (Creswell et al., 2020). This means the author is offered a greater degree of flexibility in directing the progression of the research processes thanks to the lack of structure in sequential exploratory design. Moreover, by acknowledging the responsibility that exploratory research can lay a strong foundation for future research, the author inspected the research problem in-depth firstly through online interviews and then through survey data collection. Additionally, sequential exploratory research formulates a greater understanding of how both internal and external factors influence millennial investors' perceptions of cryptocurrency. This pans out to be the optimal way in which the research can be efficiently carried out by first collecting valuable data from online interviews with respondents and following this with an online survey.

### 4.5.5. INTEGRATION METHOD IN MIXED METHODS

According to Creswell and Plano (2011), integration in mixed methods is essential as it acts like a linking tool between the mixed methods data collection and analysis. Moreover, qualitative and quantitative stages have different approaches to answering the research questions as one is associated with subjective reasoning while the other relates to statistical tools (Bryman, 2012). With regard to this study's objective, the quantitative stage can only measure millennial investors' behaviour, it cannot determine how changes in their attitudes lead to changes in their perceptions and behaviour in the presence of certain factors connected with cryptocurrency investment. Hence,

in the first phase, a qualitative approach was utilised to analyse in-depth viewpoints and as a tool for developing questionnaires for the quantitative stage. Therefore, integrating is an important part in interpreting data using a meaningful approach. Linking occurs in several ways: connecting, merging, embedding and building (Creswell and Plano, 2011).

As this thesis utilises sequential exploratory design, the most appropriate integration method was building. Integration through building occurs when results from one data collection procedure inform the data collection approach of the other procedure, the latter building on the former (Guetterman and Fetters, 2018; Creswell et al., 2013). In other words, items for inclusion in a survey are built upon previously collected qualitative data that generate hypotheses or identify constructs or language used by research participants (Creswell et al., 2013). Qualitative data collected from the first phase of this study were used to assess the quality of the underpinning theory (TPB and TAM) and HDM models. Following this was the formation of the survey, which was built upon previously collected qualitative data from millennial cryptocurrency investors. Afterwards, quantitative data collected from the survey were cleaned and analysed using NVivo 12. Lastly, the quantitative and qualitative data analysis was integrated to gain more insights into this research's topic.

## 4.6. RESEARCH STRATEGY

Research strategy provides a general direction of the research including the procedure through which the research is accomplished. An appropriate research strategy must be formed according to research questions and goals, the degree of current information on the topic area to be explored, the availability of resources and time as well as the researcher's philosophical foundations (Saunders et al., 2019). On the other hand, Yin (2018) presented three categories that researchers should follow when choosing a research strategy, which are: research questions, the level of control an investigator has over real behavioural occurrences, and the degree of concentration on present or historical events. Nonetheless, both Saunders et al. (2019) and Yin (2018) agreed that there are significant similarities among existing research strategies; thus, the crucial consideration would be to choose the most advantageous strategy for a certain research study. Some of the

commonly used strategies for exploratory research are experiment, case study, survey and grounded theory. In this thesis, the author selected grounded theory by Glaser and Strauss (1967) and survey as the research strategies for the two major phases – qualitative and quantitative – because of their relevancy to this research.

### 4.6.1. JUSTIFICATION FOR CHOOSING GROUNDED THEORY AND SURVEY STRATEGY

Despite the popularity of grounded theory in social and behavioural research, this methodology was rarely recorded in cryptocurrency investing behaviour research. In this research, grounded theory by Glaser and Strauss (1967) is applied. By definition, grounded theory is the formation of theory built from the continued interaction between data collecting, data analysis and results (Glaser and Strauss, 1967). Since grounded theory is a research strategy that strives to develop theories through the analysis of empirical data and it is useful for exploratory research studies (Johannesson and Perjons, 2014). As Glaser and Strauss (1967)'s grounded theory extracts concepts through data and advances them through coding, data analysis and data collection, it has created an adequacy between theory development and researching process for this paper. This research has consistently utilised data results and analysis in between every interview to test the theory building process.

Cryptocurrency is a new aspect with sophistication in terms of technology, market dynamics and regulatory concerns. Therefore, the process of understanding attitude, perceptive formation and decision-making from millennial investors might be challenging. Applying Glaser and Strauss (1967)'s grounded theory ensures the quality of theory built is suitable with the investigation of cryptocurrency investors' perceptions and behaviours. Grounded theory encourages researchers to begin with a broad substantive aspect (Glaser and Strauss, 1967). In the context of this study, this advocation fits with the first stage of the study as it delves into multiple aspects to learn about millennial cryptocurrency investors. It helps to identify and structure which aspects have impactful effect on millennial cryptocurrency investors' behaviours and perceptions. Simultaneously, the validation of theory building is fully enhanced via constant data comparison. This avoids

duplication and highlighting the distinction of this study's theoretical framework with existed framework from the literature. Likewise, additional data collection and analysis was conducted in the quantitative stage to verify the emerging theoretical framework.

The conceptualisation of grounded theory complements mixed-method studies (Holton and Walsh, 2017). Smith et al. (2019) stated that mixed methods offer a methodology to systematically collect and integrate both qualitative and quantitative data, which can be applied towards the goal of theory development. This suggested that the application of grounded theory in a mixed methods study can add a theory or model that provides an explanation for both qualitative and quantitative results. However, Guetterman et al. (2019) found that studies using grounded theory with mixed methods provided little methodological detail regarding the use of grounded theory, mixed methods and the combination of mixed methods and grounded theory.

The survey research strategy has a broad coverage and provides a helicopter view of some area of interest. In social sciences, surveys are frequently used for gathering basic data about large groups of people, including their activities, beliefs and attitudes. On the other hand, survey research is widely regarded as being inherently quantitative because the method provides certain types of factual, descriptive information. However, the data grid required for survey research need not to be quantitative (Johannesson and Perjons, 2014). Supporting this view, de Vaus (2014) claimed that a survey is not just a particular technique for collecting information because other techniques, such as structured and in-depth interviews, observation and content analysis, can also be adapted in survey research. This feature of a survey strategy provided this thesis with versatility for collecting data. In particular, combining a survey research strategy with mixed methods in this thesis offset the cons of a quantitative method with rich data collected from a qualitative method.

Combining grounded theory and a survey strategy can make a great contribution to this field as it is relatively new. In the first phase of this mixed methods study, grounded theory was applied in which data analysis was undertaken at the same time as data collection. This method was less time consuming and ensured the success of developing a survey strategy for the following phase, and it minimised irrelevant bias.

The application of grounded theory in the collection and analysis of millennial investors' behaviours in a cryptocurrency context allowed relevant themes to emerge from their attitudes to perceptions and behaviours. Moreover, it was claimed that the application of grounded theory is highly appropriate to explore the social side of sophisticated phenomenon and to uncover themes that were neglected in previous studies (Zhao, 2014).

On the other hand, because this research is exploratory, the application of a survey strategy is advantageous when the research goal is to describe the prevalence of a phenomenon (Yin, 2018).

Additionally, survey research is a cost-effective method which also offers reliable and authentic data. Hence, with the aim of studying millennial investors' perceptions of cryptocurrency investment, a survey strategy offers validating results and helps form survey questions for respondents.

In a nutshell, applying both strategies would offset the disadvantages of each strategy. It is claimed that it is difficult to gain in-depth understanding of a research problem using a survey strategy. This is because of the personal influence of the researcher's opinion and sterile results if the study solely applies a survey strategy. However, this problem can be avoided by applying analysis conducted after the first phase using grounded theory strategy. It provides a connection between broader contextual issues of the phenomenon, the involvement of theory development and a detailed picture of respondents' characteristics. Last, but not least, the application of two research strategies in a mixed methods research would increase the rigour of data collection and analysis.

## 4.7. DATA COLLECTION

The data collection stage can be summarised as the process of accumulating and measuring information on the variables chosen for the study, which are established in an organised manner; this allows the researcher to find answers to research questions, test relevant hypotheses for the

study and evaluate research outcomes. It is critical to comprehend the relevance of the data as well as the approach used for the study. In this thesis, the researcher conducted interviews and surveys with the participants as mixed methods were adopted.

### 4.7.1. QUALITATIVE DATA COLLECTION

For the qualitative phase, the collection of data was obtained through interviews. Interviews are claimed to be the quickest and most direct way to get in-depth information about a subject (Barrett and Twycross, 2018). Behaviours, feelings and how respondents interpret the cryptocurrency context or the world around them would be easily seen through interviewing. Likewise, it provides a deeper level of information as the author can tackle both the past and present experience of respondents.

There are three main types of interviews: structured, semi-structured and unstructured interviews. In structured interviews, the order of predetermined questions and answers is prepared before conducting interviews (Merriam and Tisdell, 2016). However, this method limits a researcher's access to participants' perspectives related to research problems. Furthermore, for phenomenon about which researchers do not have enough insights, unstructured interviews are preferred (Merriam and Tisdell, 2016) in which there is no predetermined set of questions. Nevertheless, an interviewer may become disoriented in the midst of an ocean of conflicting points of view and seemingly unrelated bits of information. Semi-structured interviews are a type of qualitative interview that employs an interview guide, which is an unstructured grouping of themes and questions that the interviewer can ask in a variety of ways. The pre-planned questions are asked during the interview (Merriam and Tisdell, 2016), but the interviewer is allowed to investigate fresh developments in the interview's topic. In a semi-structured interview, the interviewer is free to depart from the structured interview questions and sequence as long as the broad scope of the interview is maintained.

#### 4.7.1.1. JUSTIFICATION FOR THE CHOSEN APPROACH: SEMI-STRUCTURED INTERVIEWS

Semi-structured interviews are frequently referred to as "the best of both worlds". Semi-structured interviews combine features of structured and unstructured interviews, which gives them the benefits of both: comparable, accurate data and the ability to ask follow-up questions. The ability to create a conceptual framework ahead of time keeps both the interviewer and the participant focused on the job at hand; thus, eliminating distractions and facilitating two-way dialogue. The specialty of semi-structured interviews is in having a similar methodology to structured interviews and at the same time providing more depth through their more open-ended nature. Furthermore, this research approach is beneficial for understanding the perspectives of important stakeholders as it enables respondents to engage in the process and address issues relevant to the research questions.

Although semi-structured interviews begin with a set of questions, researchers need to be attuned to the ongoing discussion and ask pertinent follow-up questions that elaborate on more general knowledge. At the same time, the open-ended nature of semi-structured interviews could lead to biased responses from respondents as there is a risk of researchers asking leading questions.

In relation to the data analysis aspect, semi-structured interviews require more effort in examining a massive number of notes and, in some cases, many hours of transcripts.

For this research, the author chose to use semi-structured interviews as this method combines both unstructured and structured interview styles that merge the advantages of both. Flexibility in communication arises in this type of interviews as it allows two-way communication between interviewers and respondents. Furthermore, the research topic might be sensitive for some respondents, thus, this method allows respondents to be more open during the interview.

#### 4.7.1.2. DATA COLLECTION PHASE

The data collection for the qualitative phase took place from September 2021 to January 2022. The lengthy time frame was due to practical reasons. It was challenging at first to attract respondents as the topic is sensitive and because of schedule conflicts. Seven initial interviews took place between September and October 2021. The last three interview appointments were scheduled in January 2022 because respondents were occupied in the last two months of 2021. However, the intermission between the two periods had provided the author with time to reflect on the interviews conducted in the first period. The author took this opportunity to organise second interviews with three respondents in order to clarify the given information from their first interviews.

Individual interviews were conducted via Zoom or Google Meet with a duration of 30 minutes. English was the main language used in every interview. Prior to each interview, every respondent was emailed an interview consent form that included the aims, objectives and purposes of the study. The respondents were also informed about their rights and how data protection would be administered.

At the beginning of every interview, interviewees were asked to confirm that they had understood their rights and the purposes of the study according to the consent form. This was followed by a short introduction from the author to encourage interviewees to engage in the interview. Moreover, confirmations based on respondents' responses during the interviews frequently took place as a guarantee that the information was understood correctly. At the end of each interview, respondents were allowed to ask questions or provide comments. Audio recording using an AI tool was applied and notes were taken during the interview process.

### 4.7.2. QUANTITATIVE DATA COLLECTION

After the initial qualitative phase, identified themes and codes are used in the development of the quantitative phase. A self-designed questionnaire was constructed based on the qualitative analysis.

The questions were designed by focusing on the constructs and variables that were identified from the conceptual framework and the first phase of analysis.

#### 4.7.2.1. QUESTIONNAIRE

Applying a questionnaire as a research instrument has multiple benefits for a research study. Firstly, questionnaires provide an easy approach to collect data as they are highly organised (de Vaus, 2013). Secondly, questionnaires can be used for various areas including politics, research, psychology and sociology (Creswell, 2013). The author deemed the utilisation of questionnaires to be the ideal method for ascertaining millennial investors' perceptions of cryptocurrency as an investment. Lastly, according to Brannen's (2017) argument, questionnaires are a cost-effective and less time-consuming method. From the author's point of view, a questionnaire allowed the author to retain respondents' identities, which was a primary concern of the participants who took part in the survey. Moreover, each participant was allowed complete freedom and no pressure was placed on them to complete the survey form.

However, there is a drawback related to bias, as participants may be unable to interpret what the researcher intended. If some technical questions are included in the questionnaire, it may obstruct the generation of correct findings.

a. **Questionnaire development**

In this research, the questionnaire consisted of 25 questions with precise and simple content to avoid vague questions. Some of the questions contained different scenarios in order to encourage respondents not to respond automatically. The content of the questions was developed according to the results from phase one – qualitative research. Moreover, with the aim to conduct in-depth research on millennial investors' perceptions of cryptocurrency investment, the most important variables captured from the qualitative phase were tested in the second stage – quantitative. The interview questions from the qualitative stage were built on the conceptual framework and

presented the four major factors: economic, technological, social and government. Therefore, in the second stage, the most significant variable that represented each factor was selected to develop the questionnaire for quantitative research. With the application of NVivo, variables with a significant percentage of coverages were recorded and utilised as material for the later stage, since the percentage of coverages indicates the total number of times that a particular keyword was mentioned.

The questionnaire began with screening questions to filter identified respondents for the research. These were followed by demographic questions and then the survey advanced to a judgement-based section. From question 7 to question 13, cryptocurrency investment experience and objectives were explored. Then, questions related to respondents' behaviour and perspectives during the investing phase were presented. The sequence of displayed questions was built upon the factors identified in the conceptual framework and the analysis in phase 1: economic, technology, social and government. The last section, which comprised questions 23, 24 and 25, collected respondents' perceptive and behavioural development throughout their cryptocurrency investing journey.

Furthermore, having designed the questionnaire for the current research, a pre-test was administered by the author and the supervisors. This was to ensure the clarity of the questions and to pinpoint possible problems that could arise.

The distribution of questionnaire was established online through Twitter, Discord and Reddit and took place from February 2022.

b. **Response format**

Multiple choice close-ended and Likert scale questions were chosen. Respondents were asked to show their level of agreement and their investing experience on a 5-point Likert scale. This scale was adopted as it has been commonly used in research based on survey questionnaires and in behavioural studies (Barua, 2013; Joshi et al., 2015; Kumari et al., 2020; Chatterjee, 2017; Rai et

al., 2019). Notably, attitude, perception and behaviour are difficult to measure; however, a Likert scale was shown to be appropriate for quantifying and validating attitude, cognition, affection and action (Joshi et al., 2015). Furthermore, adopting a Likert scale for this research could increase the validity of the findings (Hartley, 2014). Last, but not least, the adaption of a Likert scale may present a high likelihood of responses that correctly reflect the respondents' perspective. This comes from the simplicity of the question format that encourages respondents to complete the survey question (Taherdoost, 2019).

To sum up, conducting data collection in two stages provided enriched information for the author to research and present a precise analysis. Moreover, primary data are collected through mixed methods that combines collecting data from interviews and an online survey in this research.

## 4.8. DATA ANALYSIS

Data analysis provides researchers with facts and statistics that allow them to analyse results and make conclusions about the targeted sample or phenomena. The data acquired in this research study comprises both quantitative and qualitative data. As quantitative analysis relies heavily on statistical tools, SPSS software has been employed to support analysis, whereas thematic analysis has been adopted for qualitative data as it requires in-depth analysis.

### 4.8.1. QUALITATIVE DATA ANALYSIS

Thematic analysis is defined as the process of detecting patterns or themes in qualitative data (Braun and Clarke, 2020). Throughout the past decade, Braun and Clarke (2012, 2014, 2020) have published different form of thematic analysis to help researchers navigate and understand their analysis to answer the research questions (Byrne, 2022). In this paper, the author has decided to apply the experiential versus critical. An experiential orientation prioritises understanding data by exploring how respondents or participants in the study experience a phenomenon. On the other

hand, discourse was perceived as constitutive of social reality in critical orientation. The analysis of patterns and theme are applied to construct a system of meanings, which may offer insights that go beyond participants' responds. With the application of this continuum, the author can unfold either the experience of social reality from cryptocurrency investment (in experiential orientation) or examine its constitution from critical orientation as suggested by Braun and Clarke (2012, 2014).

Furthermore, Braun and Clarke (2012, 2013, 2014, 2020) suggested that thematic analysis be conducted in six stages: "familiarisation with the data, generating initial codes generating themes, reviewing potential themes, defining and naming theme, producing the report". Since thematic analysis is claimed to be a time-consuming process, researchers are advised to exercise this method with greater attention. In this research, the most important stage when applying thematic analysis is "reviewing potential themes". From chapter 3. Conceptual framework, there were candidate themes risen from the literature review that required to be evaluated with the data set. This step was taken after the author had identified the relationships between the data set and codes which forming themes for this research.

In this research, the software NVivo 12 was used to assist the development of qualitative data analysis. NVivo 12 offers the author a managerial tool to organise and visualise unstructured information. By having automatically sorted and classified data into themes, the stages of coding and theme development were promptly accomplished before the time-consuming later phase of data analysis. With the help of an AI tool (Otter.ai) for recording, all transcripts were automatically transcribed during the interview. However, to get familiar with the data and to ensure the quality of every transcript, all transcripts were exported to Word documents for review. The author revised and corrected a few mistakes that appeared in every transcript. Additionally, the labels of each interview Word file were classified based on respondents' names to avoid confusion.

The researcher separated the interview data into paragraphs, sentences, phrases and words that highlighted the most significant themes from the interviews. The process by which a researcher reduces vast amounts of qualitative data into smaller units based on concepts and patterns is referred to as coding. Researchers may convert qualitative data into numbers with the help of NVivo through the percentage of coverage that counts the number of codes that fall under each category or theme during the coding process. Furthermore, a mixed coding approach was applied

in this thesis. The author started deductively with a set of codes and during the coding new codes could emerge inductively if necessary. Moreover, a table of codes was pre-set based on the conceptual framework, and seven new codes were obtained inductively from the scripts. Afterwards, the relationships between codes and themes were explored. Themes were initially determined according to the conceptual framework. Therefore, the correlation between themes and codes captured at this stage could be used to prove the relationship between two hierarchies in the HDM conceptual framework.

Furthermore, the generated themes were reviewed to assure their relationship with the coded extracts from the scripts. Subsequently, themes were reassessed if they were compatible with the whole data set. These two steps were taken according to Braun and Clarke's (2006) recommendation.

### 4.8.2. QUANTITATIVE DATA ANALYSIS

In order to analyse quantitative data, data preparation is required. Editing the data, coding the data, recording the data and cleaning the data are all part of data preparation. Besides that, three methods were conducted in this research to analyse the quantitative data: descriptive analysis, correlation analysis and regression analysis. Descriptive statistics, according to Cooper and Schindler (2008), are used to highlight location tendency (mean, median, mode), spread (variance, standard deviation, range, interquartile range) and form (skewness and kurtosis). To get a comprehensive perspective and overview of the data acquired, as well as to offer directions for a more sophisticated statistical analysis, descriptive statistical techniques were employed to define population features such as shape, dispersion and skewness. With correlation analysis, the interdependence of all variables was tested to find whether the independent and dependent variables moved in the same direction or in an opposite direction, which would suggest a direct or inverse link. Regression analysis enables the examination of the effect of an independent variable on the dependent variable and

was applied to ascertain millennial investors' perceptions of cryptocurrency investment. Finally, SPSS software was utilised to increase the efficiency of this phase.

#### 4.8.2.1. PROS AND CONS OF SPSS

SPSS is the most commonly utilised software for quantitative data analysis. According to Masood and Lodhi (2016), the primary benefit of adopting software is that it eliminates clerical and manual tasks, thereby saving time. Additionally, it can aid in the analysis of vast amounts of data that are difficult to analyse manually. This statistical program performs comparison and correlational statistical tests for univariate, bivariate and multivariate analysis using both parametric and non-parametric statistical approaches. Additionally, it enables the researcher to validate the tests' assumptions, such as the normalcy and outliers tests (Puteh and Ong, 2017). Besides that, SPSS also increases the flexibility of obtaining findings using the most appropriate method. On the other hand, SPSS is not an optimal statistical tool for examining causal and effect relationships between a number of independent and dependent variables (Puteh and Ong, 2017). Nonetheless, SPSS is still widely regarded as a dependable tool for doing statistical and quantitative data analysis (MacDonald and Headlam, 2011).

In this thesis, the data analysis method was also related to the identified variable and the use of key phrases in the study's topic. The main aim of this thesis is to understand how millennial investors perceive cryptocurrency as an investment through identifying factors that impact their attitude and behaviours. Therefore, in order to address this problem, both descriptive and statistical analyses were employed.

## 4.9. SAMPLE

### 4.9.1. SAMPLE SELECTION

In the scope of a research study, the population refers to the total number of subjects present in the area where the research is being conducted, and the researcher typically draws a sample from this population to accomplish the study's objective. A sample is a subset of the population that is specifically chosen for the purpose of collecting data in order to undertake research (Gentles et al., 2015). For this thesis, cryptocurrency investors were considered to be the population of the study. Due to the anonymous nature of cryptocurrency, the complete list of individuals using cryptocurrency cannot be retrieved. As the population was found to be infinite, a non-probabilistic sampling method – purposive sampling – was employed.

The sample size for this study is 131, which combines 10 respondents for the qualitative phase and 121 participants for the quantitative phase. As this is a mixed methods study, two different samples were selected independently to avoid bias. The age of respondents ranged from 25 to 41 years. Respondents were cryptocurrency investors or individuals who used to invest in cryptocurrency with at least 6 months of experience. The respondents were reached through intermediaries, which was online platforms (i.e., LinkedIn, Twitter, Discord and Reddit).

### 4.9.2. PURPOSIVE SAMPLING

Purposive sampling is frequently employed in social research to identify and choose examples that include significant amounts of information on the topic of interest. This entails discovering and sifting through individuals or groups of people who are particularly informed or experienced regarding a certain topic of interest (Creswell and Plano Clark, 2011).

Along with knowledge and experience, Bernard (2002) and Spradley (1979) emphasised the significance of availability and desire to engage, as well as the capacity to explain, express and reflect on one's experiences and ideas. By contrast, probability or random sampling is employed to guarantee the generalisability of findings by reducing selection bias and accounting for the effect of known and unknown confounders (Palinkas et al., 2013).

#### 4.9.2.1. PROS AND CONS OF PURPOSIVE SAMPLING

According to Palinkas et al. (2013), purposive sampling is one of the most cost-effective and time-efficient sampling strategies. In which, this sampling method may be the only acceptable approach available if the study's primary data sources are restricted in quantity. This study was being researched during the Covid-19 quarantine period, posing some barriers in collecting data. Therefore, purposive sampling emerged as a situation approach for addressing this limitation. On the other hand, it is claimed that purposive sampling is prone to low reliability and high bias owing to researcher bias, since researchers make subjective or generic assumptions when selecting participants (Palinkas et al., 2013). Nevertheless, this study has a targeted group of research subjects to avoid any generic assumption in terms of sampling, which are millennial cryptocurrency investors. The solely focus on millennial cryptocurrency investors was drawn from a gap observed in the existing literature review, rather than being influenced by the author's personal perspectives. Accordingly, the level of bias in purposive sampling is reduced to minimum.

### 4.9.3. QUALITATIVE SAMPLE SELECTION

The study will focus on the European market because of the market dynamics and regulatory environment. Eastern European countries have the most users on cryptocurrency and blockchain platform, while, more developed European countries and the United Kingdom ranked lower in the number of cryptocurrency users and investors (Romano, 2024; Fontana, 2023). Furthermore, Europe owns culturally and economically diverse with unique social elements from multi-cultured individuals, economic and political aspects. Therefore, by focusing on the European market, this research can investigate insights into cryptocurrency investors' mindsets, perspectives, the adoption trend through the lens of the market dynamic and government regulatory. Below are the profiles of respondents for qualitative sample. In which, four out of ten respondents are from Asia are collected data to compare with data collected from European respondents.

| Respondents | Roles | Field | Years of experience | Location |
|---|---|---|---|---|
| A | Director | Finance | 8 months | Vietnam |
| B | Student | Business | 1 year | UK |
| C | Analyst | Technology | 8 months | Vietnam |
| D | Customer service | Technology | 1 year 2 months | Vietnam |
| E | Unemployed | | 2 years | Poland |
| F | Associate | Finance | 6 months | UK |
| G | Stockbroker | Finance | 3 years | Vietnam |
| H | Student | Finance | 2 years | UK |
| I | Student | Business | 6 months | UK |
| J | Software developer | Technology | 6 years | UK |

Table 4.2. Qualitative respondents' profiles- Source: from the research

### 4.9.4. QUANTITATIVE SAMPLE SELECTION

In the quantitative phase, 150 respondents were selected through purposive sampling method. Since it is difficult to reach to the population of cryptocurrency investors who are millennials, purposive sampling is the most appropriate method in this context. Campbell et al. (2020) claimed that purposive sampling can provide deep insights into a problem with limited sources. Screening

questions from the questionnaire were utilised to ensure the correct sample obtained. Importantly, respondents for the quantitative phase were different from the respondents for the qualitative phase.

## 4.10. RESPONSE RATE

A response rate is the ratio of participants in a study to those who were invited to participate (Frey, 2018). Numerous methods have been created to compute response rates, each of which is based on a distinct understanding of what it means to engage completely and how eligible units are counted. Response rates are frequently used to assess the quality of data; low response rates may imply nonresponse bias. Thus, response rates are a critical metric for education surveys, and poor response rates may have an effect on the validity of estimations, analysis and inference in educational research.

### 4.10.1. QUALITATIVE PHASE

At first, an invitation to recruit respondents for the interview stage was posted on several platforms (i.e., LinkedIn, Discord, Twitter and Facebook). The invitation was presented as a survey form giving an overview of the study, its purpose, two screening questions and one question related to the main factors that influence their cryptocurrency investment. The screening questions were used to select appropriate participants for the study. Twenty people registered to take part in the study, however, only four of them replied to the researcher's emails.

As the researcher's prior objective was to conduct 10 interviews, a move to a second step was required. A first reminder was sent to the investors who had registered, excluding the participants who replied to the first email. The reminder again addressed the purpose of the study and confirmation of time and date. A further three participants confirmed the date for the interviews. After conducting the first seven interviews, the researcher sent a second reminder to those who had not replied. Unfortunately, zero responses were received from the pool of first participants,

therefore, the researcher decided to re-post the participants recruitment invitation to attract a new pool of participants.

The same platforms were used for the second time of posting an invitation online. The total number of participants in the second pool was four, but the researcher could only conduct three interviews since one of the participants withdrew. The last three interviews were scheduled for January 2022 because respondents were occupied in the last two months of 2021. The pause between the two periods allowed the author to think about the previous period's interviews. The author used this opportunity to conduct follow-up interviews with three respondents from the first pool in order to clarify the information obtained during their first interviews.

In total, 10 interviews were conducted: the first seven interviews were held from September 2021 to October 2021 and the last three were conducted in January 2022.

### 4.10.2. QUANTITATIVE PHASE

The data collection phase took place from February 2022 to June 2022. There were several steps incorporated in this phase. The survey was initially posted on different cryptocurrency forums online (i.e., Twitter, Discord and Facebook). The online survey was designed for respondents to complete in one time to serve the purpose of consistency. During the first month, only 10 responses were collected. Therefore, further action was required to increase the number of responses. A first reminder was placed to boost the visibility of the survey. Secondly, the researcher expanded the network by posting the survey on Reddit and the University group chat on WhatsApp. Remarkably, a further 45 participants filled in the questionnaire after two weeks. However, the number of responses had not matched the designed figure, so the researcher sent a reminder to the University group chat and kindly asked participants who had finished the survey to share it. The reminder had a useful effect as 20 responses were received. By the end of June 2022, total responses collected were 121.

## 4.11. PILOT STUDY

### 4.11.1. QUALITATIVE PHASE

Piloting for interviews is a vital and beneficial part of the process of doing qualitative research since it identifies areas for improvement in the primary study (Majid et al., 2017). Before conducting the interviews, the list of questions was reviewed by the supervisory team. Afterwards, a consent form giving an overview of the study, its purpose and respondents' rights was sent out. Furthermore, a verbal brief that contained the list of main questions was sent to interviewees prior to each interview. The objective of this step was to determine the suitability of the questions and to ensure the quality of the interviews. Moreover, nearly half of the participants for the qualitative phase were chosen to conduct the pilot study for this stage.

In a deeper context, conducting the pilot study helped the researcher developed rapport with interviewees, whilst gaining in-depth answers when conducting semi-structured interviews.

A consent form with information about the study, its purpose and respondents' rights were distributed. Prior to each interview, interviewees were given a verbal brief that included a list of main questions and an interview participants form with screening queries. In the form, participants were asked which factor has the most influential impact on their cryptocurrency investment, including economic, technology, social and government factors. The goal of this step was to ensure the quality of the interviews by determining the suitability of the questions. Moreover, nearly half of the qualitative phase's participants were selected to conduct the pilot study for this phase.

Connelly (2008) suggested a pilot study sample of 10% of the parent study sample. Hertzog (2008) warned that this is not a simple issue to resolve because these studies are influenced by many factors. For instance, if the author applied Connelly's (2008) method for a qualitative pilot study, the pilot sample size would be only one. Although determining an effective sample size is not the objective of conducting a pilot study in this research, a sample size of one would create bias in

testing the efficiency and appropriateness for the main sample. Therefore, the author established a pilot study among four out of the ten participants for the qualitative phase.

The list of interview questions combined three main questions for analysis and ten questions for discovering factors related to millennial investors' perceptions of cryptocurrency investment. Since an interview participants form was sent out to every participant, the author chose four participants who ticked their main purpose to invest from four different factors.

The first question asked about their investing journey, and 100% of the participants mentioned that money was the first motivation that attracted them to cryptocurrency. This displayed an interesting theme since their answers were different from the selection on the form. Respondents' answers further indicated monetary or economic factors were the main reason they invested in cryptocurrency, despite their interests in cryptocurrency being related to different aspects. To clarify this conflict, respondents shared that their interest in cryptocurrency had changed over time due to their experience with cryptocurrency. Furthermore, every participant had demonstrated a plan of how to use their cryptocurrency and was selective in choosing a blockchain platform to invest in.

All participants believed that they could earn high return from cryptocurrency investment. Interestingly, they revealed that they had strong skewness towards the market movement during the small market capital season.

In terms of technology, since four participants were chosen according to their interests in cryptocurrency, only one participant was concerned about the technical side of their investment. The participant had shown deep interest in the transparency of gaining access to the public ledger and freedom in trading. Whilst others did not express their opinions about the technical aspects of cryptocurrency, all of them mentioned the fear of cybercrime.

Furthermore, social influence was undoubtedly a recurring theme raised by respondents in increasing their cryptocurrency awareness. Throughout the interview process, it was discovered that respondents learned about bitcoin and other cryptocurrencies primarily through various social channels.

The recurring themes of major risk and the absence of regulation were identified during the interview process as key pre-investment considerations for all respondents. The respondents were particularly concerned about the prospect of these issues, and they were fully aware that they would be unavoidable if they invested in or adopted cryptocurrency. According to the majority of interviewees, cryptocurrency platforms are not regulated like other financial institutions, and cryptocurrencies have not been legalised as legal tender. As a result, there are some risks associated with long-term cryptocurrency holdings.

### 4.11.2. QUANTITATIVE PHASE

For the quantitative stage, pilot testing was conducted to increase the validity of each question. The purpose of pilot testing is concerned with the question's ability to capture the data it is designed to measure. In addition, the key advantage of pilot testing is that it allows for the identification of issues prior to conducting the complete survey. Hence, the questionnaire was firstly examined by the supervisory team. Alterations were made to three questions in the questionnaire, and explanations and examples were included for questions that might confuse the participants. For example, descriptions were included for questions 10 and 20, and restatement was conducted for question 21. On top of that, the format of the survey form was adjusted with a thank you note at the end of the survey.

Once the final questionnaires were approved, the author conducted a pilot test under survey settings with a sample size of five. These five participants were randomly selected from the targeted demographic. Participants were asked to complete the survey and indicate the time taken

to complete the survey. Five out of five participants claimed that that the questionnaire was well constructed and it had sufficient information for the respondents to understand it.

Findings collected from the pilot study showed that there are three main trends in millennial investors' adoption of cryptocurrency: the anticipated role of cryptocurrency in a monetary revolution, users' increased empowerment and control over their money, and the cryptocurrency's perceived value. Cryptocurrency adoption is fuelled by technological curiosity and investment opportunities. Nevertheless, respondents were unconcerned about the technical aspects of cryptocurrency according to the pilot study results. Furthermore, millennial investors refer to their peers and influencers in making decisions on certain types of cryptocurrency and the volume to invest. It was also recorded that millennial cryptocurrency investors' perceptions and attitudes towards the market situation are relatively positive. This influences investors' behaviour as they have become less risk averse through their investing period.

## 4.12. VALIDITY AND RELIABILITY

### 4.12.1. VALIDITY

As cited in Taherdoost (2016), the validity of the acquired data refers to how well it covers the real field of research (Ghauri and Gronhaug, 2005). In other words, the degree to which a research succeeds in assessing anticipated values and the extent to which differences identified reflect genuine differences among respondents is measured by validity (Sefiani, 2013; de Vaus, 2014). Because this study adopted mixed methods, the quantitative sample is larger than the qualitative sample; different participants were used in each phase of the study to avoid bias.

#### 4.12.1.A. VALIDITY IN QUALITATIVE METHOD

In exploratory research, there is one concern related to validity, which is the use of inappropriate qualitative results to design an instrument (Creswell and Clark, 2018). Bearing this in mind, the criteria for choosing respondents were firstly considered. Respondents were selected according to their experience of investing in the cryptocurrency market to fully capture the changes in their perceptions and behaviours. Secondly, a pilot study was undertaken through supervisors' examination; in addition, a verbal brief that contained a list of the main questions was sent to interviewees prior to each interview. Every interview was recorded and transcribed using AI technology during the interview. To ensure the accuracy of each transcript, the author re-transcribed each word by word and removed unnecessary components, such as hesitation and laughter. After the interview, some respondents' responses were validated through a second interview that aimed to clarify confusing terms and to delve deeper on certain points. A detailed description of the thematic analysis process and qualitative findings was presented, which would allow readers to assess the findings and judge the transferability of the thesis.

To further establish confirmability, triangulation of data collection methods was used in this study. Triangulation involves the use of multiple methods of data collection on the same phenomenon (Polit and Beck, 2012). Hence, besides interviews' transcripts, additional information was sought using field notes.

### 4.12.1.B. VALIDITY IN QUANTITATIVE METHOD

Cooper and Schindler (2008) defined content validity as the extent to which the content of the items appropriately represents the universe of all relevant things under examination. The content validity of this study was validated by determining the variables that had previously been developed and utilised in the literature (Churchill and Iacobucci, 2009). Questionnaires were carefully checked by the supervisors. Respondents were asked to identify any difficulty they encountered in correctly completing the questionnaire in order to elicit comments regarding the content validity. Moreover, a five-point Likert scale was adopted because a seven-point scale may provide significantly lower frequencies and a three-point scale may lead to frustration amongst the respondents due to their inability to discriminate finely enough. Simultaneously, screening

questions about the participants' profile were established to ensure the participants met the criteria for the thesis's sample.

Construct validity is the degree to which constructs are presumably related to one another in order to quantify a notion based on the ideas behind a research study (Parasuraman et al., 2005). Factor analysis was used to determine which items were acceptable for each dimension and to quantify the dimensions of a concept.

### 4.12.2. RELIABILITY

Reliability is concerned with the consistency, reliability and replicability of study findings (Babbie, 2010; de Vaus, 2014). Obtaining identical results in a quantitative phase is rather simple, however, it seems more difficult and demanding in a qualitative phase due to the fact that qualitative data are narrative and subjective.

As the main questions utilised a five-point Likert scale, Cronbach's coefficient alpha was employed. Cronbach's coefficient alpha is the most common method used for assessing the reliability of a measurement scale with multipoint items.

#### 4.12.2.A. RELIABILITY IN QUALITATIVE METHOD

To ensure the quality of qualitative collected data, interviews were recorded with AI tools to automatically transcribe respondents' responses. Afterwards, the author double checked the transcripts to ensure their quality before coding. Moreover, to eliminate any drifts in the definition of codes, continuous comparison between collected data and codes was conducted. This also ensured there was no shift in the meaning of codes during the process of coding.

### 4.12.2.B. RELIABILITY IN QUANTITATIVE METHOD

In order to maintain consistency in the quantitative phase, Cronbach's coefficient alpha was employed to assess the questionnaire's reliability. It is claimed that Cronbach's coefficient alpha is the most often used approach for determining the reliability of a measurement scale containing multipoint items (Hayes, 1998).

## 4.13. ETHICS

Ethical concerns are critical in research because it is the job of research to define ethical and moral standards in research and to work to maintain them, since breaching them can result in academic and ethical offences with serious repercussions. Study ethics are the primary prerequisite for any type of research, and the researcher is required to adhere to them (Halej, 2017). These ethics are integrated to safeguard both the researcher's subjects and the researcher. Ethical concerns might arise at any stage of the research process, including data collection, design and authoring the research.

Moreover, honesty was deemed to be the most critical component of the research process since it is one of the ethical views utilised to guarantee that the study's validity and reliability are maintained. As a result, the research's methodologies and methods were linked with its primary purpose and objectives. Additionally, personal bias has been avoided to assure the research's trustworthiness. Thus, the data obtained were authentic and were not presented in a fabricated or manipulative manner in order to reduce errors in the research findings.

Likewise, the researcher's moral integrity is vital for ensuring the study process and the researcher's results are trustworthy and legitimate. Therefore, the anonymity of participants was taken into consideration in both qualitative and quantitative phases of the study.

In the qualitative phase, a letter of consent was sent out to every participant before the interview that informed them of the research's purpose and objectives. Participants' data were utilised following their consent. Participants were given the right to decline answering any questions that they would not like to answer. Importantly, the participants' identity and confidentiality were preserved with code names. Each code name was assigned to each interview transcript, which was subsequently utilised to present transcripts' excerpts in the report of the findings.

In the quantitative phase, participants were not obliged to provide their names or personal information to protect their identities. The collected data were stored in encrypted software (FileVault). Only the author's login password can decrypt and mount this drive data. All data were anonymised and the author is the only person who can access this data.

## 4.14. CONCLUSION

This chapter described the research methodology that guided the current study. The research philosophy was introduced and the pros, cons and suitability of the selected research philosophy were discussed; justification for the selected philosophy was then provided. Pragmatism and an abductive approach were selected to provide relevant and actionable information about cryptocurrency investment based on respondents' experiences. Abductive reasoning was grounded in pragmatism and utilised incomplete observations from experience and reality to arrive at the best possible prediction of the truth or a new theory.

In addition, to achieve the purpose of the study, mixed methods were employed with a sequential exploratory design, which started with a qualitative approach and ended with a quantitative approach. Due to cryptocurrency investors' preference for anonymity, cryptocurrency investment is regarded as a sensitive subject. Hence, the mixed methods approach of combining statistical analysis with observation broadened the scope of this research and improved its reliability and

credibility through the use of a variety of evidence. However, mixed methods present sampling difficulties and are time consuming.

In the first phase of this mixed methods study, grounded theory was applied, and data collection and analysis occurred simultaneously. This method saved time while ensuring the success of the next phase's survey strategy development and minimising irrelevant bias. This study is exploratory, and the application of a survey strategy is advantageous when the research objective is to describe the prevalence of a phenomenon. Furthermore, the author selected semi-structured interviews for the qualitative phase because it allowed two-way communication between the interviewer and the respondent, thereby allowing for flexibility in communication. The qualitative phase was followed by the quantitative phase in which multiple choice and Likert scale questions were selected. On a five-point Likert scale, respondents were asked to indicate their level of agreement and their investing experience.

This study's sample size is 131: 10 participants for the qualitative phase and 121 participants for the quantitative phase. As this is a mixed methods study, two independent samples were chosen to prevent bias. The respondents' age ranged from 25 to 41 years. Respondents were cryptocurrency investors or had previously invested in cryptocurrency for at least six months. For the location factor, this study focuses on European market as it is culturally and economically diverse. Europe is one of the popular markets for cryptocurrency with the number of users ranked in the 2nd place of the world (Romano, 2024). Together with the fact that millennials in Europe have higher risk appetite comparing to older age group has inspired this research to conduct a study in the Europe (Graham, 2024). Moreover, purposive sampling was employed since the quantity of the study's primary data sources was limited and it provided time and cost benefits.

# Chapter 4: Methodology

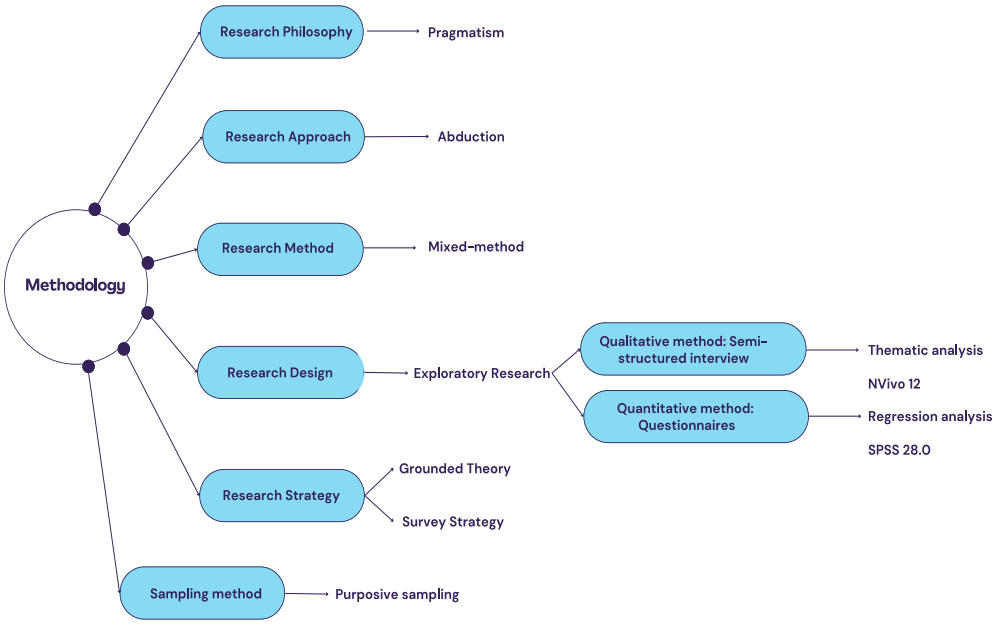


Figure 4.1. Research Methodology – Source: from the research

# CHAPTER 5: DATA FINDINGS FOR QUALITATIVE METHOD

## 5.1. INTRODUCTION

The purpose of this study was to determine how millennial investors perceive cryptocurrency as an investment based on the combination of TPB and TAM. Secondly, the objectives of this study were to conduct a comprehensive literature review on the determinants that influence millennial investors' perceptions and their behaviour in relation to cryptocurrency, which are: economic, technology, social and government. The impact of these four main factors was assessed by using mixed methods for both data collection and analysis. In terms of sample size, purposive sampling was applied to select the 10 respondents for the qualitative stage, whilst simple random sampling was applied to select the 121 participants for the quantitative stage. However, 28 out of 121 questionnaires did not meet the criteria of the research. These questionnaires were therefore excluded from the statistical analysis, leaving a total of 93 questionnaires for the quantitative stage.

Moreover, the author adopted an abductive approach with pragmatism to provide relevant arguments and feasible results about millennial investors' perceptions when they are investing in cryptocurrency. Hence, the findings from this thesis are presented exhaustively for this purpose.

In this chapter, the author focused on interpreting results from the interviews of the qualitative phase. For the first phase of the study, qualitative analysis was administered through thematic analysis of the interviews with 10 millennial investors. A demographic analysis of the respondents' profiles (gender, education level and occupation) is given in the next section.

## 5.2. DEMOGRAPHICS FOR PHASE ONE: QUALITATIVE METHOD

In this research, there were two phases of collecting data: interviews and survey questionnaires. There were 131 respondents selected for data collection of which 10 respondents served on the first phase of data collection. The sample was thoroughly considered to deliver the best representation of the population. Furthermore, as the purpose of this research focuses on millennial investors, the age range of respondents was strictly limited to the range from 25 to 41 years.

In the first phase of data collection, the majority of respondents was men, 4 out of 10 respondents were women and there was one non-binary respondent.

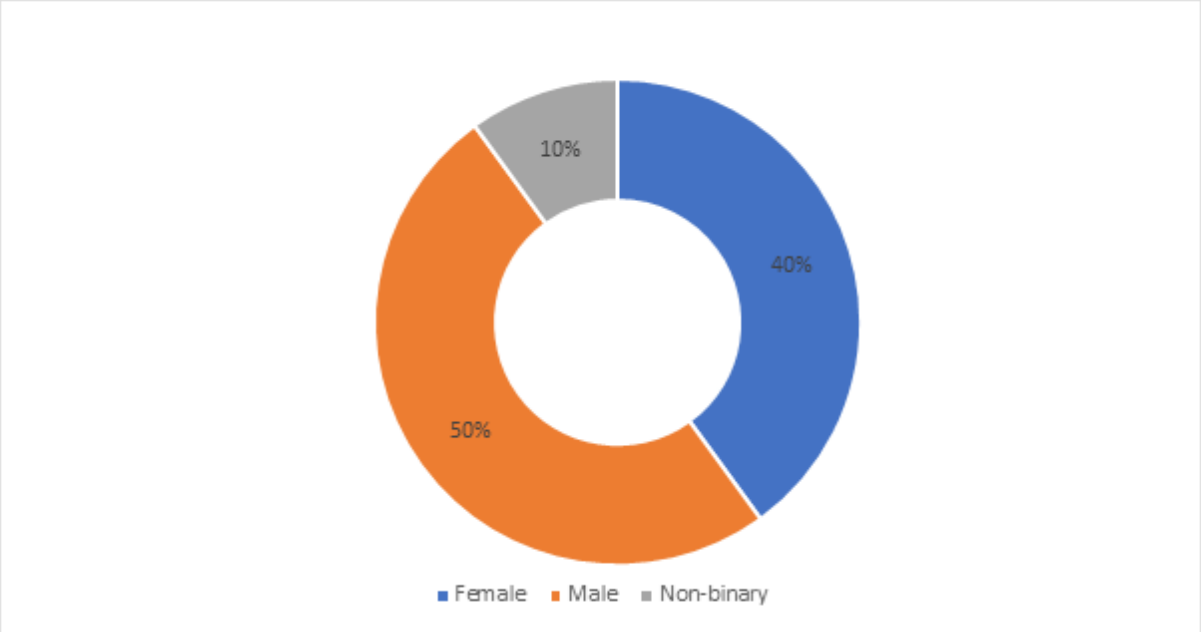


Figure 5.1. Demographic for phase one: gender – Source: from the research

Based on an agreement during the interviews, some respondents did not want to share their education levels. However, data from figure 5.2. were collected from respondents who agreed to reveal their education levels. It is presented that the number of respondents who had a bachelor's degree is equal to the number of respondents who had a master's degree. Only a few of them is currently on Doctorate level.

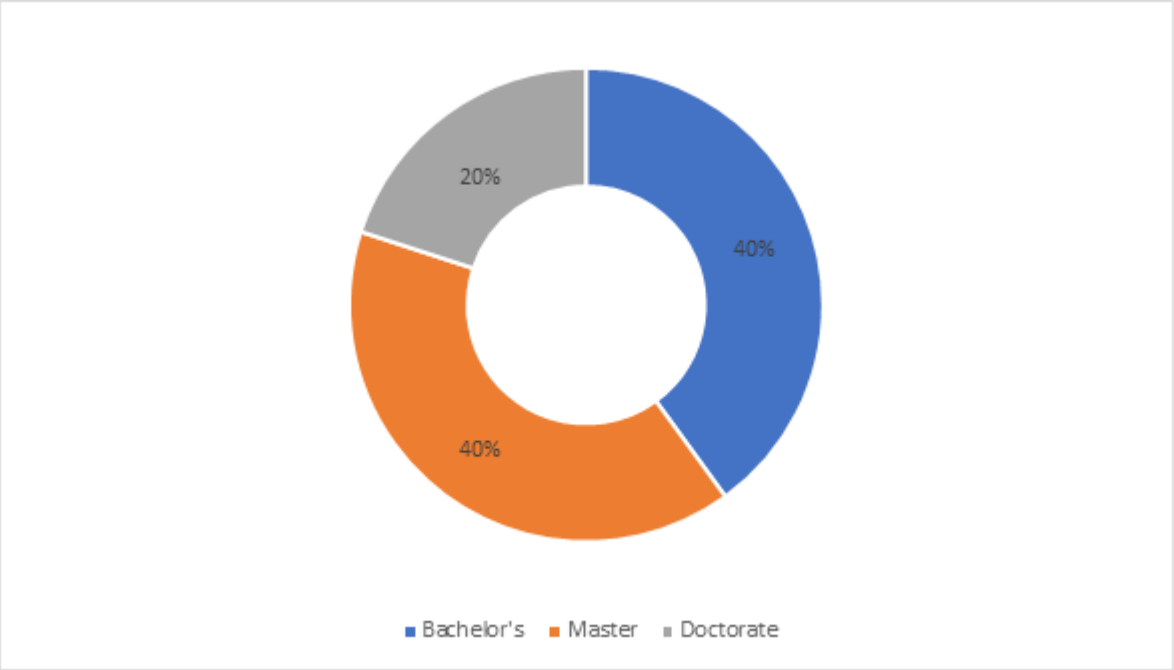


Figure 5.2. Demographic for phase one: education level – Source: from the research

Most of the respondents worked full time or were studying full time. This information can be found from table 4.2. There was only one respondent who was in between jobs. Moreover, the majority had a financial background and only a few came from the technological sector.

## 5.3. DATA ANALYSIS FOR PHASE ONE: QUALITATIVE

### 5.3.1. SYSTEMATIC ANALYSIS

As mentioned in the methodology chapter, thematic analysis was applied in the qualitative phase in order to identify different facets of the research's subject. According to Yin (2013), thematic analysis combines various steps of identifying, classifying and discovering themes from the interview transcripts. In this manner, the author attempted to validate and corroborate the results by thoroughly examining the transcripts and categorising themes using codes. By repeating this step with prudence, the author could guarantee that the acquired qualitative data were analysed and that the purpose and objectives of this research had been covered. In other words, the purpose

of using thematic analysis was to determine which factors affect millennial investors' investing decisions and how millennial investors perceive cryptocurrency as an investment. For further clarification, the author applied the six steps stated below to achieve the appropriate dimensions of the research process.

The first step was transcribing data from oral to written form. By using Otter AI, the transcript was transcribed automatically. Nevertheless, the author had double-checked the transcript word by word and eliminated unnecessary components. Applying the HDM from the conceptual framework assisted the author to organise the collected data in a logical manner. This means questions and answers from the interviews were transformed into themes according to the HDM.

The main focus of the second step was classifying and tagging contextual data and transforming it into useful categories. Every transcript was carefully reviewed, and concise words and bullet points were used to construct a summary of the most significant topics expressed in the interview. After analysing every transcript, the author used phrases and sentences to characterise the codes. Every code was based on an interpretation of the respondents' answers. Due to the vast amount of data, it was crucial to identify codes that would assist the author in addressing the primary study questions. Moreover, the similarities and contrasts across open codes persisted when the method became the focal point. New codes that were formed outside the conceptual framework were: drive, platform, usage, strategy, long-term investment, short-term investment.

In the third step, the author organised data by coding respondents' quotes into appropriate codes. The whole approach enabled the researcher to interpret the codes in order to find legitimate and relevant material and achieve the study objectives. It also made it possible for the author to easily retrieve answers to the research questions.

In the fourth step, a narrative summary of all the findings collected from interviews was constructed. It allowed the author to effectively exhibit every respondent's experience, opinion and key ideas expressed during the interview.

Once the main points were completed, step 5 will be conducted. Narrative summaries of the subject regarding the perception and behaviour of millennial investors with cryptocurrency investment will be formed. The major objective was to assess how millennial investors' perception affected, how it has changed throughout the time of investment and which factors influence their behaviour or decision.

After organising and identifying factors influencing millennial investors, a written presentation was prepared. This last step was mainly based on the principal themes and demonstrated a detailed explanation of how the perception and behaviour of millennial investors were determined. The next section presents a more in-depth analysis that includes grouping all the emergent concepts and drawing conclusions to identify their significance with support from existing theoretical literature.

### 5.3.2. Themes and codes for qualitative method

This section focuses on the researcher's interpretation of the conducted interviews and the main themes for the qualitative phase. The main objective of the qualitative interviews was to explore the interviewees' opinions, behaviour and experiences related to their cryptocurrency investment. Respondents were allowed to share information in their own words in accordance with the semi-structured questions. With the help of NVivo 12, themes were derived from respondents' answers and following with this study's objectives. Moreover, the author relied on the percentage coverage in NVivo 12 to identify the keywords and develop main themes for the first stage in this thesis. Percentage coverage in NVivo 12 is a curious statistic which tells you the percentage of the Data File that the reference coding represents (NVivo 12, n.d.). In other words, it presents the number of times a particular word was mentioned in each interview that could help the author to identify main themes and keywords. Furthermore, percentage coverage in NVivo 12 indicates which variable is the most significant.

#### 5.3.2.1. First theme: the factors that influenced millennial investors to invest in cryptocurrency

Before conducting the interview, respondents were asked to fill out a form including which factor had the most influential impact on their cryptocurrency investment. Four major factors were listed: economic, technology, social and government factors. The purpose of this pre-interview survey is to categorise which factor has the most influence on each respondent, thus, open-ended questions relating to each factor were asked during the interview.

The results showed that 42% of respondents claimed that economic factors had the most significant impact. The pie chart (Figure 5.3) below indicates the percentage of main factors that have a major influence on participants' cryptocurrency investment.

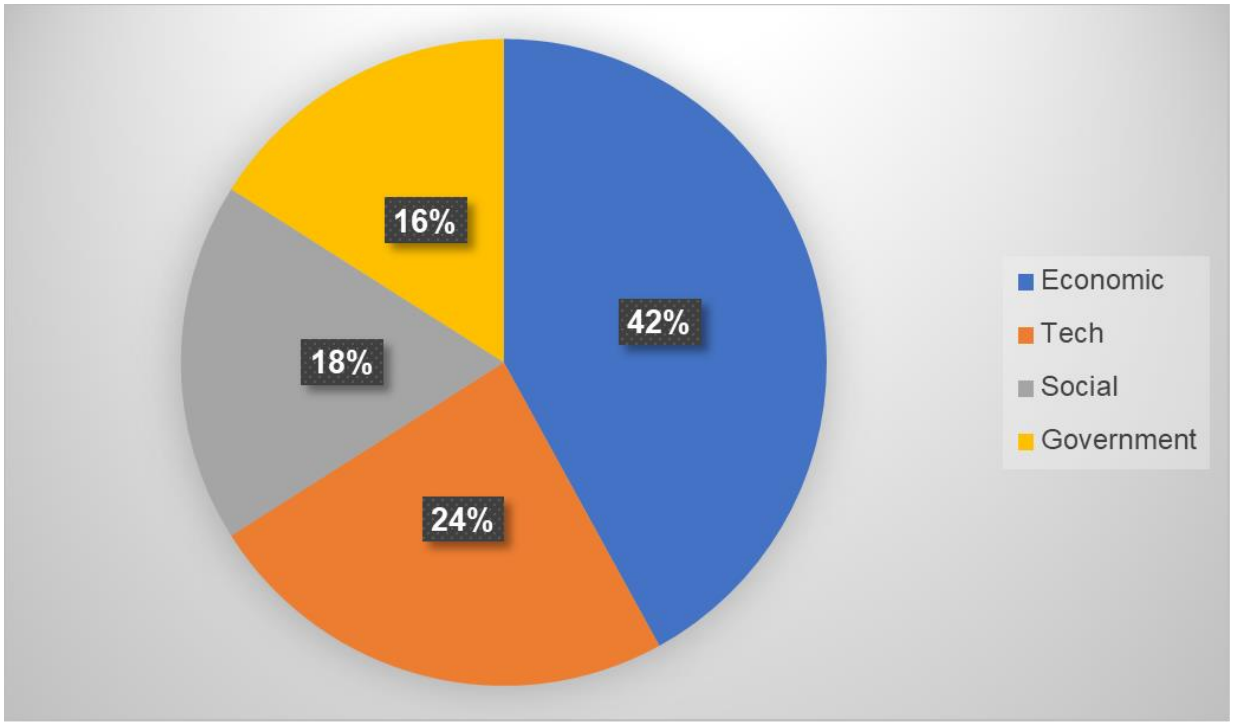


Figure 5.3. Factors impacting millennial investors' perception of cryptocurrency investment – Source: from the research

At the beginning of the interview, respondents were kindly asked to share their cryptocurrency investing journey, including the duration (i.e., how long have they been investing in cryptocurrency) and what encouraged them to invest (i.e., what was their motivation to invest in cryptocurrency). This question was asked to make the respondents familiar with the topic and to reconfirm their factor choices in the pre-interview survey form.

However, the results from the interviews differed from the data shown in Figure 5.3. In answer to the question, 7 out of 10 respondents claimed that the primary reason they had decided to invest in cryptocurrency was to earn money, which is an economic factor. This result partly correlated with Silinskyte's (2014) research, since performance expectancy significantly influenced the usage of Bitcoin. Moreover, in most previous studies about other financial investments, high returns or return potentials are the main factors that motivate investors to invest in mutual funds (Singal and Manrai, 2018; Sharma, 2019; Obamuyi, 2013).

In addition, most respondents were initially impacted by their friends, family members or acquaintances when they acknowledged others gaining great profits from cryptocurrency. This could clearly be seen from respondent J's reply, "I chose economic factors. I came to cryptocurrency because of money. I believe most people invest for that reason too". Respondent G also claimed that, stating "I joined cryptocurrency market because of money. I saw that they have potential growth in both long term and short term". This indicates millennial investors perceive cryptocurrency as an investment and as a stream of income. Furthermore, monetary incentives were amplified as respondent D claimed that "what motivated me was the salary of my first job, it was a very low paying salary so I had to look for other streams of income". These examples illustrate that respondents were fully aware of why they wanted to invest in cryptocurrency.

While answering the same question, C mentioned that "during the pandemic, I started to see my friends pumping their money into cryptocurrency and gained a lot from that. I got hooked to that and started to invest since then". Another respondent - B stated, "last year, my husband was also investing in cryptocurrency as well. Then I saw that he was making profit from it, so it got me

interested in cryptocurrency". These answers show that respondents were influenced by their friends, family and acquaintances to invest as their attitudes changed. This finding is consistent with Tangwattanarat (2018), Alzahrani and Daim (2019) and Ahmad and Wu (2023), as they studied about investors' trust towards others' opinion when it comes to investment.

A minor portion of respondents invested in cryptocurrency because of curiosity. For example, respondent F said that "curiosity got me hooked to cryptocurrency". This was also indicated in respondent I's response, "when I was a student, I was thinking I would like to try to see how it's going". The insignificant influence of curiosity captured in this research is related to Presthus and O'Malley (2017) who found that technological curiosity was the major motivator of Bitcoin adoption.

#### 5.3.2.2. SECOND THEME: INTERACTION WITH CRYPTOCURRENCY INVESTMENT

The second question was related to how millennial investors interact with cryptocurrency investment. The author wanted to gather information about millennial investors' approach and find out which channels the respondents were currently investing in. According to respondents' answers, cryptocurrency platforms are the most popular method. This is expressed in respondent A's answer, "I am using Binance now" or in respondent F's answer, "first of all, I have to choose a platform or market that I believe it is easy to trade on, so it should be a well-known platform, like Binance". There was only one respondent, respondent B, who was currently active on a cryptocurrency platform that was associated with an internet-only bank. The reason respondent B gave was, "this year I was not sure how to do the investment and, you know, what to look for which coin to buy. I did a bit of research about that, and I also have a bank account with Revolut. I can easily see the whole picture of my investment and it is easy to use that platform as well". Therefore, cryptocurrency platforms, especially well-known platforms like Binance, are widely accepted by millennial investors.

#### 5.3.2.3. THIRD THEME: THE USAGE OF CRYPTOCURRENCY INVESTMENT

The next question focused on the usage of cryptocurrency investment. To record appropriate data for this part, the codes “plan” and “use” were identified with a coverage of 12% in NVivo 12 (see Table 5.1).

From the collected data, the theme “the usage of cryptocurrency investment” was developed; each respondent had different plans and usage for cryptocurrency investment. Respondent A said, “I want to hedge for the future as the company that I am working for could collapse at any moment that I would not know”. Sharing a similar idea, respondent D said, “now I invest in Bitcoin, because I genuinely believe I can use it as a safe haven asset, now our economy is falling”. Yet, investors used cryptocurrency for their own interests. Respondent D used cryptocurrency for encrypted online games; respondent D said, “I sometimes buy certain coins and use it to play games as well”. While respondent I used it “to purchases things that can be purchased with Bitcoin”; respondent F said, “it was for my personal use”. On the other hand, earnings from cryptocurrency were utilised to invest in other channels in the future. This point was mentioned in respondent C’s response, “for now, I want to make lots of money from cryptocurrency and planning to pour the money I gain in real estate”. Lastly, respondent J used cryptocurrency as a tool to boost his confidence. Respondent J initially mentioned that “I plan to earn more to retire early” and, secondly, “getting a job nowadays is stressful. I think to own a good amount of money in hand would make you feel more confident, less stressful when looking for jobs. That is how I use my cryptocurrency investment”.

From these responses, it is shown that most participants have a clear plan on how to use their cryptocurrency investment. In other words, they have built a perception of cryptocurrency usage and actions in order to achieve their plans.

#### 5.3.2.4. FOURTH THEME: CRYPTOCURRENCY IS AN INVESTMENT OPPORTUNITY – ECONOMIC FACTORS

The first question in this category was asked to identify whether millennial investors perceive cryptocurrency as an investment opportunity. The investment opportunity theme was consistently regarded within the data as being the significant theme influencing millennial investors. Out of the 10 respondents, 9 agreed that "cryptocurrency is an investment", which correlated with Glaser et al.'s (2014) findings that cryptocurrency users are drawn to the investment opportunity of cryptocurrency despite its volatile characteristics. However, the code "investment" only covers 16% in NVivo 12 coverage percentage (see Table 5.1). Despite the majority perceives cryptocurrency as an investment, respondent E, said, "it is hard for me to consider it as an investment opportunity". Respondent E's contrasting view might reflect the respondent's perception of cryptocurrency as a "kind of gambling but with very low risk".

For the majority, cryptocurrency was perceived as an investment. For example, respondent A stated, "I decided to invest some of my money, I decided to allocate some assets into that". Respondent I perceived the potential of cryptocurrency, and mentioned, "I found that the cryptocurrency market is certainly a new place to invest, and it has the feature of anonymity and provides an anonymous way for the transactions". Moreover, some respondents revealed why they thought cryptocurrency was an investment opportunity. Respondent D mentioned that "I invest in Bitcoin, because I genuinely believe I can use it as safe haven asset" and respondent G stated, "it is an investment opportunity as it brings me money". Therefore, the next questions were asked to focus on the reason why cryptocurrency was perceived as an investment opportunity.

#### 5.3.2.5. FIFTH THEME: GAINING MORE MONEY – ECONOMIC FACTORS

Given the significance related to returns in the literature review, it was no surprise to identify numerous quotations stressing the importance of the factor. The keyword "money" was consistently regarded within the data as being a significant factor with 15 text units. Additionally, the theme "gaining more money" in NVivo 12 had a coverage of 18.17% (see Table 5.1). In the interview, respondent J, who chose economic factors in the participants form, said that "I came to cryptocurrency because of money" and "I want to see if I can earn money from cryptocurrency or not". Respondent J confirmed that "high return is the main reason why I wanted and still now want

to invest in this market". Sharing a similar reason, respondent C also said, "I'm in for the money" and respondent B stated, "I used to chase those promising projects and mostly because of money".

Nevertheless, one of the respondents was in for the high return but preferred to hold it. Respondent E said that "people do like buying and selling when they go up like 15 or 20% but, for me, I expect hundreds of percentages in return. I choose to hold it". Although technological factors might be the reason why investors decided to invest, the monetary theme was the significant influence, as in respondent H's response, "I am curious about the technology, but I also want to earn some money".

According to these answers, it is evident that investors consider the outcome of the investment, which is earning high returns, to be the main reason why they invested. Smales (2022), Liu and Tsyvinski (2021) and Lin (2021) findings were the same as this research, that is, cryptocurrency investors' attention has a positive relationship with returns. However, the findings contradict the findings of Mattke et al. (2020), Bleher and Dimpfl (2019) and Katsiampa et al. (2019).

The cryptocurrency market is influenced by large price fluctuations, which was proved to link with the transaction volume conducted by investors (Balcilar et al., 2017). Moreover, Katsiampa et al. (2019) proved that there is a relationship between cryptocurrency transaction volumes and returns. Therefore, the next question focused on how millennial investors would react to price movement when investing in cryptocurrency.

#### 5.3.2.6. SIXTH THEME: THE INFLUENCE OF PRICE MOVEMENT – ECONOMIC FACTORS

The results of searches using NVivo 12 confirmed the importance of this theme as the keyword "price" was mentioned with a coverage of 40.93% and referenced as "the influence of price movement" theme (see Table 5.1).

The significant effect of price movement was captured by respondent E who stated, “I depend a lot on the price movement”. Respondent J also shared, “I had spent quite a lot of time trying to figure out their price movement”. Interestingly, price movement changed the participants’ perception about cryptocurrency, for example, respondent A observed that “the cryptocurrency prices continue to go up” and “I invested when I saw the price continued to go up and it encouraged me to study about this”. Furthermore, price movement shaped strategy when it comes to cryptocurrency investment; this sub-theme was apprehended through respondent A who stated, “I noticed I had changed my strategy several times at first. When I first bought it at a price about 3000, and I continued to buy up and the market collapsed to 1600. Then, I changed my strategy and now I stick to DCF (Discounted Cash Flow model)”.

Secondly, price movement is considered when an investor decides to buy or sell their asset, for example, respondent B stated, “Price as well, mainly the price. So those are the factors that I consider before buying or selling”. Moreover, since the cryptocurrency price fluctuates dramatically, it affects both the behaviour and intention of millennial investors. For example, respondent E was “looking for something, it can go up a lot so I invested in the one that is very volatile” or respondent C said, “once I put in money, I check it every few hours because this small cap market is super volatile. It goes up and down every hour”. Correspondingly, respondent F stated, “The price started going up and back is very volatile, now I think Bitcoin’s price is a bit calmer compared to other coins. But, yeah, the price went up which means I got profit. So that’s the reason why I had such a long journey with Bitcoin”. This variable is also considered a significant factor impacting investors’ perceptions and investment decisions in the stock market in Ungeheur and Weber (2020).

Another sub-theme identified was cryptocurrency market cycle, which was mentioned by 3 out of 10 respondents. Respondent D shared that “I mainly look at the market cycles. I know that Bitcoin runs on a four-year cycle so, essentially, I’m trying to scale out in the peak”. Respondent I stated, “At the beginning, I lost a lot of money. But as you slowly start to kind of grasp or understand the market, you would make money. I observe my portfolio go up and down and hope for the

best". Therefore, the connection between market cycle and price movement affects millennial investors in terms of perception and behaviour.

On the other hand, there was an interesting theme that some millennial investors were not influenced by price movement as stated by respondent I, "price does not mean anything". Likewise, respondent F claimed that "whenever I saw price went up or went down dramatically, I would always stay calm. I was not influenced by the price movement, because I believe in my own judgement".

These answers confirm that price movement has an influence on millennial investors' perceptions of cryptocurrency investment. However, since the respondents' behaviours differ, a link between price movement and millennial investors' behaviour is not justified. In order to confirm, further justification was conducted in the later phase of the study.

#### 5.3.2.7. EIGHTH THEME: SENDING MONEY ABROAD – ECONOMIC FACTORS

From the literature review, the low international transfer fee was described as one of the favourite features of cryptocurrency. However, this theme was insignificant as none of the respondents had opinions about this feature. The main reason was no one had used cryptocurrency to send money abroad. One of the respondents said, "I do send money abroad but not with cryptocurrency" (Respondent E). Another interviewee stated, "I usually use Western Union because I send money to my parents" (Respondent B). This shows that there was no connection between low international transfer fee and millennial investors' perceptions and behaviour.

#### 5.3.2.8. SEVENTH THEME: THE INFLUENCE OF FEES – ECONOMIC FACTORS

The next questions of the research focused on whether the cost of utilising cryptocurrency could affect investors who are or were investing in cryptocurrency market. In other words, this question was asked in order to confirm that millennial investors prefer cryptocurrency as it offers a lower fee compared to traditional banking system. All respondents were aware that a transaction fee is applied when investing in cryptocurrency. For instance, respondent G mentioned "they take fees off" and respondent A stated, "I have to pay some gas fees, basically like the transaction fee whenever I want to withdraw from the chain to my cold wallet".

The findings in this research are not in line with the findings of Alzahrani and Daim (2019) as 10 out of 10 respondents agreed that cryptocurrency has a low transaction cost, however, the cost did not affect their actions in cryptocurrency investment.

Nearly 5% of the coverage summarised from NVivo 12 was referenced to the theme (see Table 5.1). Moreover, respondent A stated that "I just notice that the fee is quite small, so I don't really notice. I don't really mind".

#### 5.3.2.9. NINTH THEME: ACCESS TO PUBLIC LEDGER – TECHNOLOGICAL FACTORS

This question related to the control of the cryptocurrency system. It was asked to test whether millennial investors were concerned about this side of the technology. However, only 2 out of 10 respondents were aware of the access to public ledger feature. "I totally understand because this thing they say is decentralised and transparent. You can access the public ledger at any time" (Respondent D). None of the respondents showed an interest in the free access to public ledger when investing in cryptocurrency. "I know about that feature, but it is out of my interest" (Respondent E). This result is related to Abramova and Bohme's (2016) research who reported that free access to the public ledger had the weakest effect on users' perceptions of Bitcoin. Notwithstanding, Sas and Khairuddin (2015), Khairuddin et al. (2016) and Krombholz et al. (2017)

demonstrated that decentralisation and free access to public ledger are the primary reasons for Bitcoin adoption.

#### 5.3.2.10. TENTH THEME: THIRD PARTY CONTROLS INVESTORS' ACTIVITY – TECHNOLOGICAL FACTORS

From the interviews, 2 out of the 10 respondents claimed that they were fully aware of third-party supervision as a feature of cryptocurrency. In NVivo 12, third party's supervision emerged as an insignificant theme for the adoption of cryptocurrency investment since the coverage was 4.82% (see Table 5.1). Cryptocurrency users/investors control, however, was proved to be one of the significant factors affecting cryptocurrency users in Khairuddin et al. (2016) and AlShamsi and Andras (2019).

In this thesis, responses did not clearly indicate that millennial investors are influenced by this feature. Only a few of the respondents shared their opinion about freedom from third party control. Respondent I expressed that "the government could not control the market but could not control your finance somehow. I believe the platform is willing to provide your activities to the government in order to gain trust from them to be active in that country". Respondent D, who was aware of this feature, stated that "decentralised gives you full control of your financial status and there is no third party involved. However, it is a good thing if you know the government starts using this system because you can essentially track what or where our tax is spent. But for us, there is no privacy anymore".

#### 5.3.2.11. ELEVENTH THEME: HIDING IDENTITIES IS A FEATURE TO AVOID GOVERNMENT'S CONTROL – TECHNOLOGICAL FACTORS

This question aimed at asking respondents about their awareness of the anonymity feature of cryptocurrency. All respondents were fully aware of this feature with a coverage of 11.68% from NVivo 12 (see Table 5.1); hiding identities is identified as one of the major themes for this phase.

Hiding identities was the motivation for respondent I to invest in cryptocurrency. Respondent I shared, “I found that the cryptocurrency marketplace is certainly a new place to invest, and it has the features of anonymity and provides an anonymous way for transactions”. Respondent F expressed that “hiding your identities or being anonymous, I love it” and the reason was “no one knew who I was, no one could touch my money and so on”. And for respondent J, “when you interact with someone, let’s say I want to sell something to others, they would not know who I am, and vice versa”.

However, one of the respondents did not consider this feature of cryptocurrency. The respondent H claimed, “because Vietnamese government do not track my trading or whatever I have on the platform, so being anonymous or not does not bother me”. This is an interesting theme as most respondents agreed that being anonymous is a benefit for them. Previous research from Yilmaz and Hazar (2018) also demonstrated anonymity is not the main concern from cryptocurrency investors.

Therefore, it could not be certainly proved that hiding identities has a major impact on millennial investors’ perceptions and behaviour. The author elaborates this point in the later phase of the study.

#### 5.3.2.12. TWELFTH THEME: TRUST IN THE CRYPTOCURRENCY SYSTEM – TECHNOLOGICAL FACTORS

In this research, the author wanted to assess whether millennial investors’ perception of cryptocurrency adoption is correlated with risk attitude. Therefore, a question about the level of

security was asked to measure its degree of importance among respondents. From the data collected, all respondents were aware of the security of the cryptocurrency system with a coverage of 24.32% captured in NVivo 12 (see Table 5.1). The importance of security theme was supported by respondent J who stated, “I trust the cryptocurrency system. They have high security”. This correlates with Kim (2021) and Andrade et al. (2012) who found that interviewed cryptocurrency users, who had been asked questions related to cryptocurrency technology, had trust in the system.

However, although respondents acknowledged the security of the cryptocurrency system, they owned to doubts about it. For example, respondent I stated, “I know that cryptocurrency is decentralised, which means it is secure. But I do not trust the system”. Respondent A expressed a similar view, “I think a lot of people still feel that this is a risky investment. There is no protection for the investors” and respondent C stated, “I do not really trust the system, I think 40%”. This was a controversial theme as some of the respondents did not have trust in the cryptocurrency system. Therefore, further research was required in phase two to clarify the influence of the cryptocurrency system on millennial investors’ perceptions and behaviour about this type of investment.

#### 5.3.2.13. THIRTEENTH THEME: CYBERCRIME – TECHNOLOGICAL FACTORS

This question was asked to further clarify investors’ perception of the risk that they may encounter when investing in cryptocurrency. The results of searches using NVivo 12 confirmed the importance of this theme with 18.02% coverage referenced to the theme (see Table 5.1).

Most of the respondents believed that cryptocurrency could be hacked even though it is decentralised. This view can be clearly seen from respondent C’s response, “But for me, I am worried about hackers more than the government. Hackers can hack your money if you’re not careful with your wallets”. Respondent F emphasised that “on the internet, anything can happen, and you do not really know who they are, where they come from”. Also, respondent H claimed

that “I don’t trust the system but the money that I put in is still safe. I still put my money on the platform” and “hackers could probably watch some of my money”.

Furthermore, respondents were asked unstructured interview questions relating to their behaviour to develop a comprehensive perspective of millennial investors. Since some respondents feared hackers, some of them took action to protect their coins. For example, respondent A said, “If that chain is hacked, then my coin will be lost. To be safe, I just transfer every now and then when I have a decent number of coins. Hackers could probably watch some of my money”. The respondents’ behaviour in this research supported Khairuddin’s (2019) findings since users expressed that fear of cybercrime affects how they store their money.

On the other hand, 2 out of 10 respondents claimed that they do not care about hackers. For example, respondent E said, “I do not care about hackers because I only invest a few”.

It is evident that the risk of hackers is significant among millennial investors although respondents mentioned that they believe in the cryptocurrency system. The awareness of cybercrime in cryptocurrency captured from the interviews is noteworthy and correlates with Parashar and Rasiwala’s (2018) results. Answers obtained from this question indicated that the risk of being hacked not only affects respondents’ attitudes, but also influences their behaviour, for example, the majority had decided to transfer their coins into a wallet.

#### 5.3.2.14. FOURTEENTH THEME: THE INFLUENCE OF FRIENDS AND FAMILY – SOCIAL FACTORS

Following the theory underpinning this research, subject norms impact attitude (Ajzen, 1991). This means receiving support from peers or family could influence one’s intention in cryptocurrency investment. Hence, this question was developed and asked to identify the relationship between millennial investors’ perceptions and the support of the surrounding environment.

According to the data collected, the theme of friends and family emerged as a significant theme with 56.8% coverage referenced to the theme in NVivo 12 (see Table 5.1). During their investment period, 7 out of 10 respondents referred to their friends' and family's opinions. One of the respondents confirmed that "I only listen to my friends" (Respondent H). Respondent C stated that "I trusted my friends and listened to them. For example, which kind of coins, how much to put in, for how long". Similar thoughts were expressed by respondent F, "I also collect information from my friends" and by respondent H, "I usually seek advice from my friends".

However, a few of the respondents were not influenced by their friends. For example, respondent D said, "I do not take advice from friends because they are all against" and respondent A stated, "No, I am not influenced by friends". Respondent I commented, "I do not normally discuss these kinds of topics with them. Unless somebody specifically asked me about the theories or the way that the market is going".

According to the majority, one could conclude that there is a significant relationship between friends and family and millennial investors' perceptions and behaviour. This was indicated in previous papers from Tangwattanarat (2018), Alzahrani and Daim (2019) and Abraham (2020). Nevertheless, friends and family do not have an impact on some millennial investors' perceptions and behaviour in cryptocurrency investment. The negative relationship between social influence and cryptocurrency users was captured in Craggs (2017) and Bashir et al. (2016). Due to the disagreement of findings, further clarification was sought in the later phase of the study.

#### 5.3.2.15. FIFTEENTH THEME: INTERACTION WITH SOCIAL MEDIA – SOCIAL FACTORS

The next question focused on whether social media could impact investors' perceptions when investing in cryptocurrency. Summaries generated from the answers had 31.46% coverage in

NVivo 12 (see Table 5.1), which indicated that social media has a substantial impact on millennial investors. All of the respondents claimed that they follow social media related to cryptocurrency. The engagement with social media in cryptocurrency investment or usage was also evidenced in Bohr and Bashir (2014), Garcia et al. (2014), Craggs (2017), Khairuddin and Sas (2017) and Abraham (2020).

Most respondents chose to follow well-known influencers as indicated by respondent C who said, "I did try to follow some well-known influencers", respondent I who stated, "I use Twitter and follow well-known people" and respondent J who commented that "I only trust influencers' opinions". Respondent H mentioned that "I mostly get my information from Twitter" with the purpose of "trying to catch new trends".

Further discussion with respondents revealed that "I've joined some paid groups on Telegram. I buy a monthly subscription where a person just researches on the next hot coin and that is where I mainly get my information" (Respondent G). Interestingly, the type of platform or type of social media utilised by investors was greatly dependent on the kind of cryptocurrency that they were investing in. This was shown by respondent I's response, "I used to use Telegram. Sometimes you will get juicy information but since I'm not buying small cap coins anymore, I only focus on the big caps and mid-caps like Bitcoin or ETH. So, I stopped using Telegram".

Nevertheless, none of the respondents revealed how they treat the information or the actions they conduct. Therefore, it is confirmed that social media affects millennial investors' perceptions, but it has no correlation with their behaviour in cryptocurrency investment.

#### 5.3.2.16. SIXTEENTH THEME: THE INFLUENCE OF NEWS – SOCIAL FACTORS

There is a lack of consensus on whether news could influence the cryptocurrency market and possibly determine investors' behaviour. In order to know more about the relationship between

news and millennial investors in a cryptocurrency context, the next question focused on the impact of news on respondents' perceptions and behaviour.

The collected data indicated that the influence of news has a moderate impact on millennial investors with a coverage of 12.52% referenced to the theme (see Table 5.1). All respondents claimed that there is an impact of news on their attitude but it did not have any effect on their behaviour. According to respondent A, "I follow the news, but I just do not trade on the news". Respondent B also shared that "unless there is significant news that affects every market, I will consider it. But I rarely check the news to invest, to be honest". Respondent D also indicated that news does not have an impact on millennial investors' behaviour by expressing that "I think it would not affect Bitcoin or the cryptocurrency market". This result correlates with Craggs's (2017) findings but contrasts with those of Garcia et al. (2014) who proposed that informational media affect the behaviour of investors in the cryptocurrency investment.

Notwithstanding, two respondents – F and H – mentioned that "I have to read the news, information related to the coin" and "I do read the news" for the purpose of study.

These respondents' answers clearly show that interviewees refer to news as a source to obtain information for their own interests and that it does not serve the purpose of investing in cryptocurrency. Therefore, there is no link between news and millennial investors' attitude and behaviour in cryptocurrency context as they did not act on the news.

#### 5.3.2.17. SEVENTEENTH THEME: THE ADOPTION OF PROJECT INFORMATION – SOCIAL FACTORS

The next question asked by the researcher was associated with the causal relationship between project information, which is a white paper, and millennial investors' perceptions and behaviour towards cryptocurrency investment. The theme of project information appeared to have a minor

influence on millennial investors with 10.12% coverage in NVivo 12 that referenced to the theme (see Table 5.1).

Interestingly, only respondents who admitted that they invested in cryptocurrency because of the technology had paid attention to project information. For example, respondent H said that “I do look at white paper sometimes” and respondent E said, “I'm happy to lose money, but it does force me to learn about the project”. Respondent E further stated, “I feel like I need to look at the information about the coin to ensure if the decision I want to make was right”

On the other hand, project information was only referred to when “the coin has a hype and they have a clear website with all the information like what it is, what is the purpose, where it’s going from here, I will invest in. Information about the project and legal regulations related to cryptocurrency” (Respondent D).

In contrast, respondent A stated, “I do not take into account any kind of information or technical analysis. I should have read the white paper, and I should at least know something about coding”.

From the collected data, it is unclear whether millennial investors adopt project information when they invest in cryptocurrency market. However, in Tangwattanarat’s (2018) paper, project information or white paper has an influence on tech savvy respondents’ behaviour, whilst it does not have an impact on other respondents.

#### 5.3.2.18. EIGHTEENTH THEME: TAX SCHEME – GOVERNMENT FACTORS

One of the main characteristics of cryptocurrency is no third party or any government has control over the market. Hence, Bitcoin or cryptocurrency investing and trading is prohibited in various nations. Nonetheless, government recognition would help cryptocurrency usage accelerate and create a more favourable and relaxed environment for new and existing investors. In this section,

to test the important links between governments' tax policies and millennial investors' perceptions, questions related to tax scheme were asked.

All of the respondents were fully aware of the regulations in the country in which they were currently investing, especially on the tax side. For example, respondent B said, "I am currently in the UK and UK government charges 20% on capital gains. For now, it is okay, I am willing to pay tax".

Given the importance of this theme, a further question was asked, and it seemed that permission to trade had a moderate impact on respondents' attitude to cryptocurrency that led to an equally decision of investing in cryptocurrency. NVivo 12 gave a coverage of 20.35% to the sub-theme (see Table 5.1). Respondent B answered, "if the coin is not legal trade, it is a no from me". The respondent further stated that "it should be a safe investment in term of regulations". Moreover, respondent C declared that "if cryptocurrency was banned in Vietnam, I guess I need to stop investing". This shows that respondents were willing to act according to the law, which indicated there is a strong relationship between permission to trade and millennial investors' perception and behaviour. The result correlates with Abramova and Bohme (2016) as potential government regulations was proved to have an effect on Bitcoin users' behaviour in the use of Bitcoin.

#### 5.3.2.19. NINETEENTH THEME: THE INFLUENCE OF POLITICAL RISKS – GOVERNMENT FACTORS

Due to complicated political concerns, a nation's currency could be negatively affected, which could lead to its citizens looking for other kinds of assets or currency to invest in. By way of an example, if investors' faith in their government were shaken, then cryptocurrency investment could rise. Therefore, the last question in the interviews was aimed at understanding how political risk determines their perception and behaviour when investing in cryptocurrency. A coverage of more than 5% was summarised by NVivo 12, which indicated that this theme exerted insignificant influence (see Table 5.1). All respondents claimed that political risk did not affect them when they

decided to invest in cryptocurrency. This was clearly presented by respondent J, “I never think about political risk”. However, evidence that there was no connection between political risk and cryptocurrency investment was not ascertained because respondent A stated, “but if there is a new selection for the US president then I would consider, because it not only affects the cryptocurrency market but also other markets”.

In the section below, a table is formed with the aim to categorize the collected data from NVivo 12. Main themes, codes and the percentage of coverage are generated for clearer demonstration about the qualitative data.

## THEMES, SUB-THEMES AND CODES FROM QUALITATIVE DATA COLLECTION

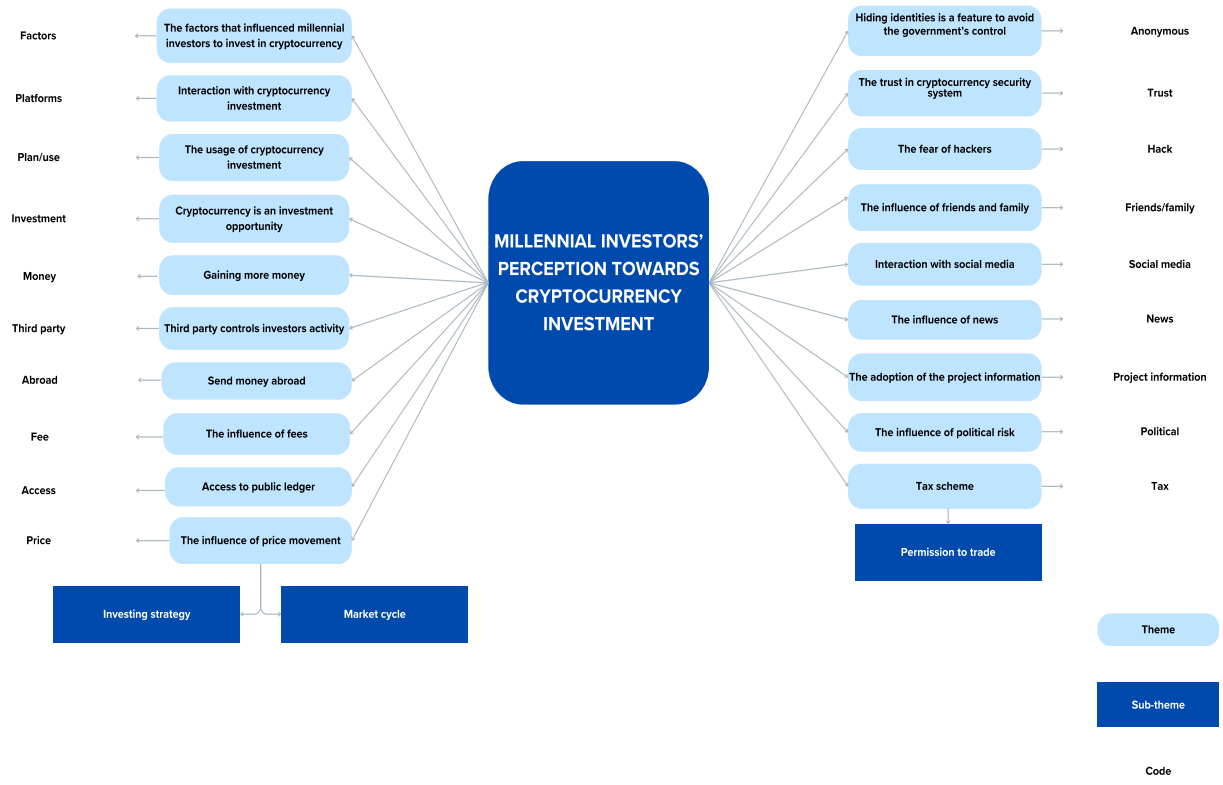


Figure 5.4. Themes, codes and coverage percentage in NVivo 12 – Source: from the research

### 5.3.3. SUMMARY FOR PHASE ONE: QUALITATIVE

This chapter focused on qualitative data analysis and results presentation for the first stage of the study. Demographics, theme and correlation analyses were conducted. To begin, demographic research found that most of the respondents were men and they adopted cryptocurrency investment earlier than female respondents. Furthermore, respondents who have a master's degree and a bachelor's degree were more prevalent in the survey comparing to respondents who have a Doctorate degree. Likewise, the majority of respondents is having a full-time occupation; however, their professional areas were different. Most of the respondents are currently working in finance and technology.

Second, thematic analysis was applied, which initially identified the millennial investors' perceptions of cryptocurrency investment and tested the relationship between each factor and their perception and behaviour. A larger number of respondents stated in the interviews that they invested in cryptocurrency because of economic factors than the number of respondents who stated economic factors on the initial form that was sent to them prior to the interview (see Figure 5.3).

Moreover, the variables "friends and family" (with a coverage of 56.8%) and "price movement" (with a coverage of 40.9%) in the interview data had the most influence on millennial investors in cryptocurrency investment (see Table 5.1). On the other hand, the variable "send money abroad" and technology factors had the least impact on respondents as the coverage for each of the technology variables was between 4.8 and 5% and for "send money abroad" it was around 1% (see Table 5.1).

Third, thematic analysis was used to analyse the hierarchical decision of millennial investors by testing their awareness of the factors that could affect their attitude and assessing the relationship between their perception and behaviour for each theme. It was evident from the qualitative data analysis that millennial investors were aware of every aspect of cryptocurrency investment. From the first three themes (see section 5.3.2.1; 5.3.2.2.; 5.3.2.3), it is clearly suggested that the

perception and attitude of respondents are strongly related to the usefulness and the ease of use in choosing cryptocurrency platforms to invest. This leads to the development and transformation of millennial investors' perception in controlling their behaviours toward cryptocurrency investment.

However, the link between respondents' perceptions and behaviours could not exactly be demonstrated as some of the variables had only affected their perception according to the qualitative findings. This prevented a thorough understanding of millennial investors' perspectives on cryptocurrency investment. Due to this limitation, a quantitative study was required.

Overall, the objective of the quantitative data analysis was to incorporate the qualitative findings into the quantitative findings, which are presented in the following chapter, rather than to come to any firm conclusions about the variables that affect millennial investors' perceptions and behaviour towards cryptocurrency investment.

Analysis of the qualitative results revealed that three main sections required further research: price movement, trust in the system, and friends and family. Since economic factors are recognised as the most important determinant, the theme "price movement" was chosen to detect respondents' perception and behaviour. Additionally, various sub-themes were raised during the interviews that were related to price movement. Secondly, the research target in this research are millennials, who are recognised as tech savvy and the main adopters of Fintech. Hence, with their openness to technology, the author is interested in gaining details about this by testing their trust in cryptocurrency investment. Trust in the cryptocurrency system was acknowledged as the main reason why users or investors adopted Bitcoin and cryptocurrency from previous research (i.e., Khairuddin et al., 2016). Finally, the relationship between peers/family and respondents is significant in the qualitative phase. In the next stage, millennial investors' behaviour in relation to cryptocurrency is studied in the context of friends and family to identify whether investors value others' influence or their own judgement.

Besides, these variables, "fees" and "sending money abroad" from economic factors, "access to public ledger" and "no third-party controls" from technology factors, "news" and "project information" from social factors, and "political risks" from government factors will be excluded

due to their insignificance. Below is the new model formed from the qualitative stage (Figure 5.5) and the questions developed for the three main areas are shown in Table 5.1. This new model is called Millennials Decision Model.

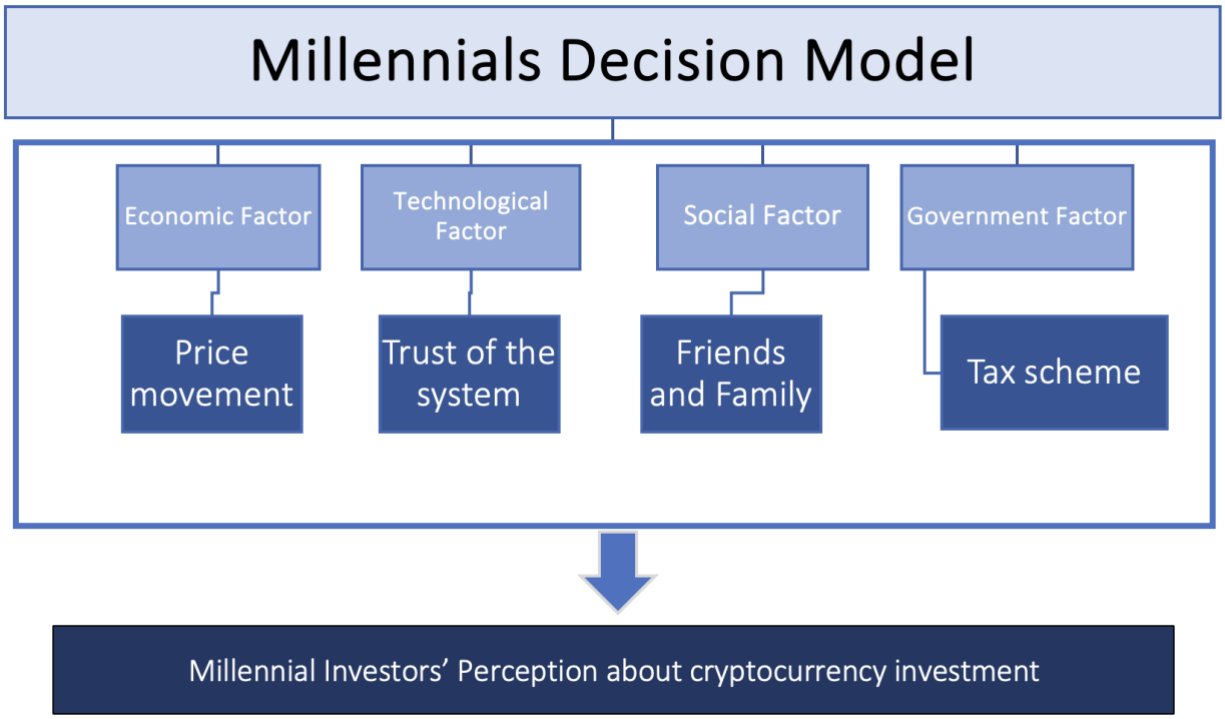


Figure 5.5. Millennials Decision Model - new model formed from qualitative analysis – Source: from the research

Figure 5.5. portrays the model developed based on the qualitative portion of the study's findings. The boxes illustrate the most significant variables captured from the qualitative results: price movement, trust in system, and friends and family. Each of the mentioned variables represents a main factor that influences millennial investors' perceptions of cryptocurrency as an investment. For instance, price movement represents economic factor, trust in the system represents technological factor, and friends and family represent social factor. Moreover, the qualitative results showed that government factor did not have a significant impact on the respondents' perceptions of, and behaviour in relation to, cryptocurrency. Nevertheless, the author would like to assess the impact of government's tax scheme on millennial investors in the context of attitude

and behaviour, hence, government factor is kept for this purpose. Additionally, hypotheses formed in chapter 3 will be altered in chapter 6 (section 6.6.1) since new model constructed in figure 5.5.

The questions developed for the three major areas are shown in Table 5.1.

| **Variables** | **Question** | **Area affected by variables** |
|---|---|---|
| **Price movement** | I am influenced by price movement | Perception |
| | I choose to hold when the market performance is poor | Perception – Behaviour |
| | I forecast changes in cryptocurrency prices based on past cryptocurrency price | Behaviour |
| | I rely on my previous experiences in cryptocurrency market for my next investment | Behaviour |
| | After a prior gain, I am more risk seeking than before | Perception |
| | After a prior loss, I am more risk averse than before | Perception |
| | After a prior loss, I tend to avoid the same investing strategy | Behaviour |
| **Trust in the system** | I trust the security of blockchain and cryptocurrency system | Perception |

| | | |
|---|---|---|
| | I feel safe when investing/trading on a cryptocurrency platform as it could not be hacked | Perception |
| **Friends and family** | I invest in cryptocurrency because of my friends/family/colleagues | Perception |
| | Other investors' decisions when choosing cryptocurrency coins have an impact on my investment decisions | Perception – Behaviour |
| | Other investors' decisions about cryptocurrency volume have an impact on my investment decisions | Perception – Behaviour |

Table 5.1. Questions developed from the qualitative stage

# CHAPTER 6: DATA FINDINGS FOR QUANTITATIVE METHOD

## 6.1. INTRODUCTION

For the second phase of this study – quantitative method – descriptive statistics were used to analyse the frequency of responses for each statement. At the same time, descriptive statistics will summarise the data collected from Likert scale in simple numerical form to support the later regression analysis. Additionally, Pearson's correlation analysis was applied to examine the relationship between millennial investors' perception and the four main factors to determine the movement and strength of variables dependent upon on another. Multiple regression analysis was conducted in accordance with the objective of determining the influence of the independent variables on the dependent variable. Moreover, with support from SPSS, the quantitative stage of this study was conducted to analyse the demographics and to conduct regression, correlation and reliability analysis.

The quantitative method phase begins with a preliminary examination of the data by describing the data preparation stage including editing, coding, cleaning, data classification and response rate. Secondly, descriptive statistics were compiled in order to gain a general understanding of the study's variables. The descriptive statistics were also used to partially answer the research questions by identifying the factors that influence the millennial investors' perceptions of cryptocurrency investment. The research study's hypotheses were then tested, followed by a discussion of the findings.

Within this phase, the reliability and validity of data were reported with Cronbach's alpha. SPSS version 28.0 was utilised to conduct the quantitative data analysis.

## 6.2. DATA PREPARATION

Data preparation was performed before data analysis. It included data editing, coding, data capture and data cleaning. The data were collected on Microsoft Forms and automatically generated to

Microsoft Excel; therefore, issues related to duplicates, typos or spelling errors are reduced to minimum. To ensure the quality of data after importing the data from Microsoft Excel to SPSS 28.0, a frequency test was performed on each variable to identify any invalid responses and to verify there were no structural issues.

The participants were asked to respond to two screening questions about their age and cryptocurrency investment. From 121 collected questionnaires, 28 questionnaires did not meet the criteria of the research. In which, 17 questionnaires were related to the age restrictions and 11 questionnaires were eliminated as these participants had not invested in cryptocurrency. These questionnaires were therefore excluded from the statistical analysis, leaving a total of 93 questionnaires. The author recoded every variable with new names on SPSS 28.0 by automatic recode function for the convenience of data analysis. This combines the transformation of string data to numerical data.

In particular, 11 scenario questions were generated into new variable names with coded answers. For example, Table 6.1. indicates the label of Likert scale options.

| **Likert scale options** | **Labels** |
|---|---|
| Strongly agree | 0 |
| Agree | 1 |
| Neutral | 2 |
| Disagree | 3 |
| Strongly disagree | 4 |

Table 6.1. Labels of answers

For “Yes or No” or “True or False” questions, a similar logic was applied as Yes/True was labelled as 0, and No/False was labelled as 1. In some cases, the answer “Maybe” and “None of the above” were labelled as 3.

## 6.3. RELIABILITY AND VALIDITY

Reliability analysis is a statistical measure used to determine the validity and reliability of a research instrument based on the items and responses contained within the data. In this context, the instrument's reliability was determined using Cronbach's alpha, a widely recognised and utilised measure for analysing the internal consistency of data via reliability analysis. The test was administered using SPSS 28.0, which aids in analysing the instrument's reliability and validity.

In Figure 6.2, valid and invalid cases are indicated from the case process summary, as well as the total number of responses. After amendments on relevant cases, there were 93 valid cases, which means the total validity is 100 since none of the cases were excluded.

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 93 | 100.0 |
| | Excluded | 0 | 0 |
| | Total | 93 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Figure 6.2. Case Processing Summary – Source: from the research

Furthermore, the reliability statistics demonstrated the validity and reliability of the data set. The validity is determined by the value of Cronbach's alpha, which must be greater than 0.70 or 70% for the data to be valid and reliable, where N is the number of items in the study. The “N” indicated a total of 36 items for the study, of which 12 items were related to economic factors, 7 items related to technology factors, 10 items were in social factors, 2 items belonged to government factors and the others were related to usage, benefits, risk and changes in perception and behaviour.

In Figure 6.3, the Cronbach's alpha value is 0.756%, which is higher than the standard acceptable level of 0.70 or 70%, which suggests that the instrument used in this study is valid and reliable for data collection and analysis.

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .756 | .768 | 36 |

Figure 6.3. Reliability Statistics – Source: from the research

## 6.4. DEMOGRAPHICS FOR PHASE TWO: QUANTITATIVE

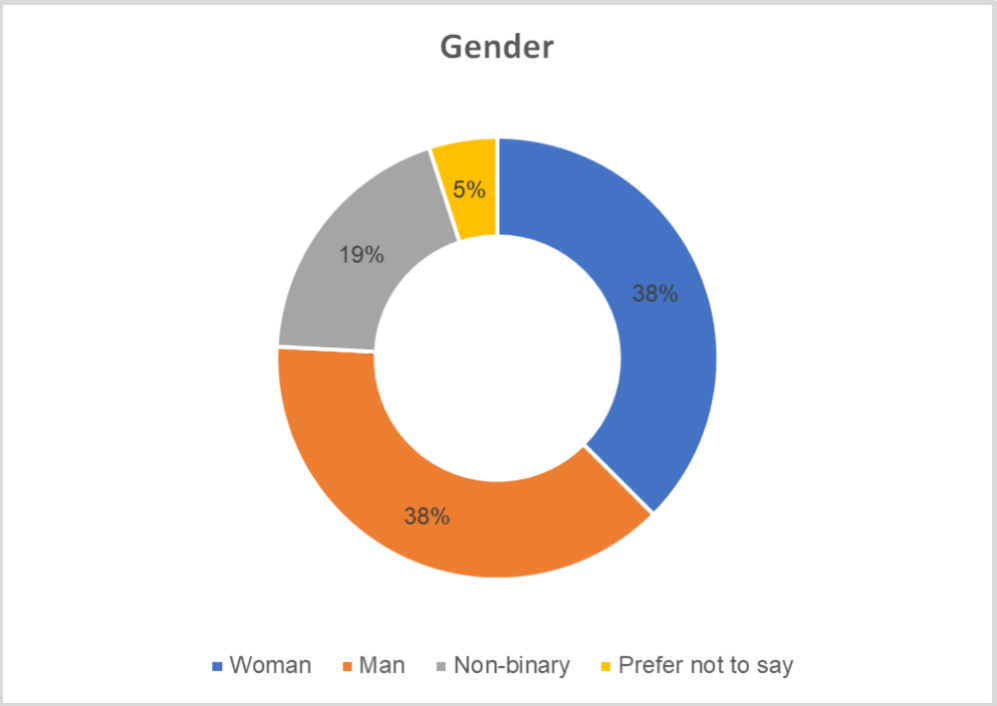


Figure 6.4. Demographics for phase two: gender – Source: from the research

There were 121 participants in the quantitative stage. However, an amendment was conducted to filter out irrelevant cases that brought the total number of valid cases to 93. In the second phase of data collection, the number of male and female participants was identical. Compared to previous research, the demographic data in this research are distinctive since cryptocurrency investors' profiles were formerly shown to be male-dominated (Hasso et al., 2019; Lammer et al., 2019; Dorn Jones et al., 2015). Furthermore, 19% of the participants were non-binary and the rest refused to reveal their gender (see Figure 6.4).

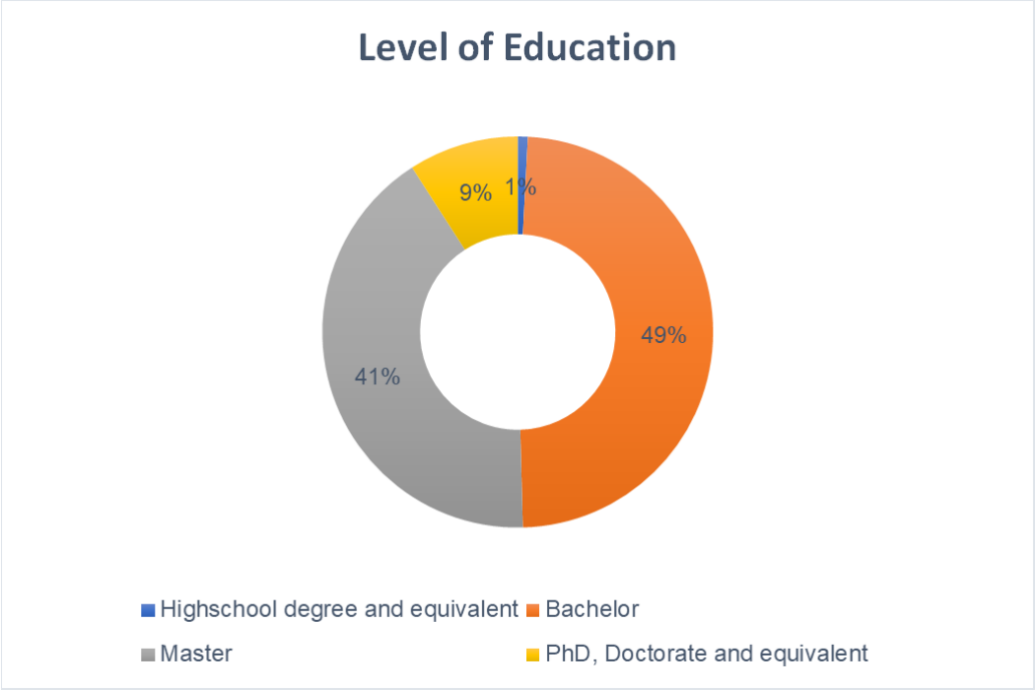


Figure 6.5. Demographic for phase two: level of education – Source: from the research

From the data collected from the questionnaire, the majority of participants had a bachelor's and master's degree. A small portion of participants had a doctorate degree which accounted for 9% and only one participant had a high school degree and equivalent (see Figure 6.5).

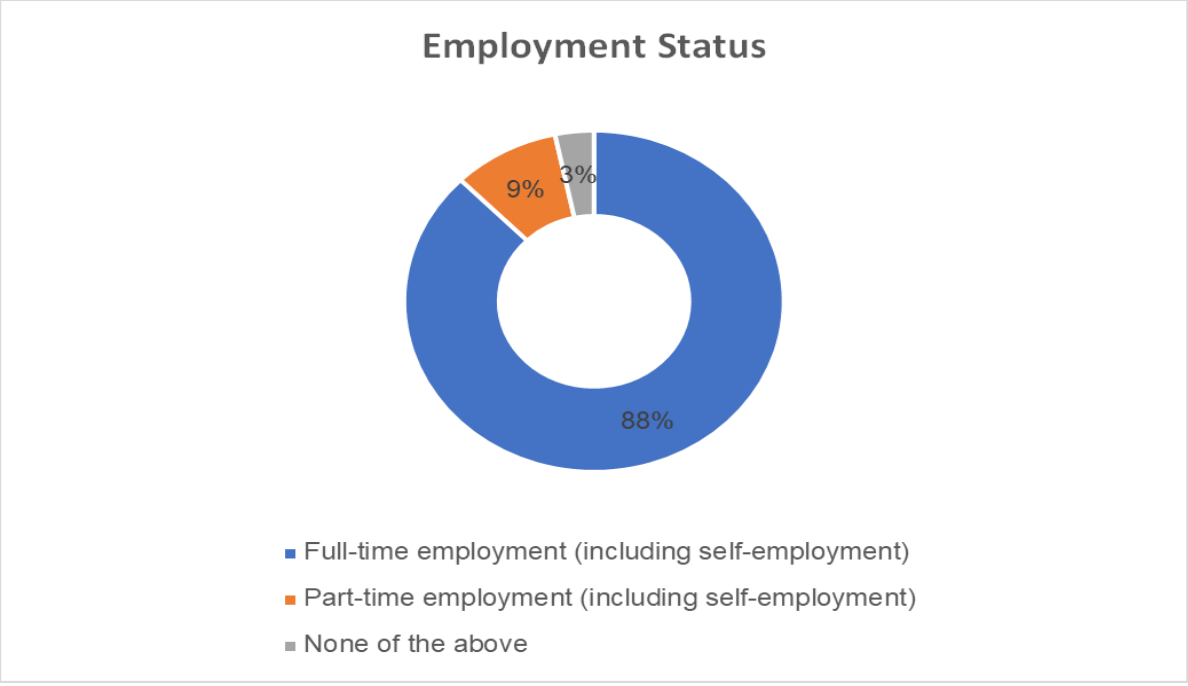


Figure 6.6. Demographics for phase two: employment status – Source: from the research

Figure 6.6 shows that 88% of participants were working or studying full time, whilst only 9% had part-time jobs. Interestingly, 3% selected none of the above.

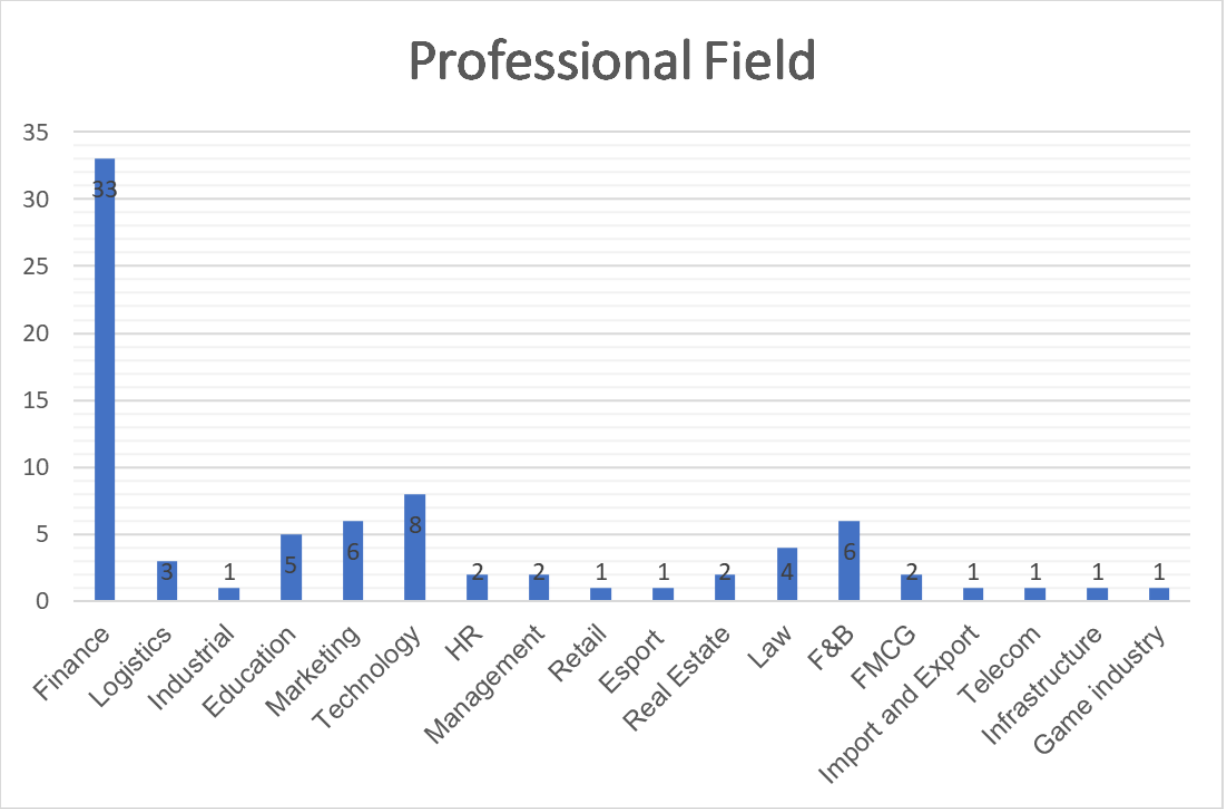


Figure 6.7. Participants' professional field – Source: from the research

Figure 6.7 presents the diverse range of industries that participants were working in. Out of 93 participants, 33% of them worked in finance, which combines business and banking. Technology, marketing, food and beverage (F&B), education and law were the sub-main industries, whilst the rest worked in logistics, industrial, human resources (HR), management, retail, Esporta, real estate, fast-moving consumer goods (FMCG), import and export, telecom, infrastructure and games industry. The results revealed that millennial investors who are working in finance or are financially literate were significantly interested in cryptocurrency investment. This aligned with previous studies about cryptocurrency investment as investors who had a financial background or worked in finance were more likely to be aware of Bitcoin (Henry et al., 2017; Sabri, 2016).

## 6.5. FACTORS INFLUENCING MILLENNIAL INVESTORS' PERCEPTIONS OF CRYPTOCURRENCY INVESTMENT

This section investigates the factors that impact millennial investors' perceptions of cryptocurrency investment by using frequency analysis. With help from SPSS 28.0, a full frequency analysis of the four main factors is presented below.

### 6.5.1. ECONOMIC – PRICE MOVEMENT

The following question in Figure 6.8 asked respondents about their attitude towards price movement and whether they were influenced by the market. The percentage of strongly agree and agree combined for this statement was 63.4%. Moreover, 26.9% of participants were neutral to the statement, expressing their uncertainty regarding the statement, which is a moderate proportion compared to the proportion who agreed. Surprisingly, nearly 10% of participants denied being influenced by price movements, and no participants strongly disagreed with this statement. These results indicate that the majority of participants were strongly influenced by the price movement from the cryptocurrency market. This aligned with Ungeheur and Weber's (2020) findings when there is a relationship between investors' perception of dependence and decision and the frequency of return co-movement of stock prices.

**I am influenced by the price movement**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 19 | 20.4 | 20.4 | 20.4 |
| | 1 | 40 | 43.0 | 43.0 | 63.4 |

| | | | | | |
|---|---|---|---|---|---|
| | 2 | 25 | 26.9 | 26.9 | 90.3 |
| | 3 | 9 | 9.7 | 9.7 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.8 – Source: from the research

In Figure 6.9, the question asked respondents to elaborate on their attitudes towards price movement. In the context of this statement, the number of people who agreed with it was higher compared to the previous statement. According to the cumulative percentage shown in the table above, 78.5% of respondents strongly agreed or agreed for this question. However, 16.1% of respondents remained neutral, stating that they are unbiased when a negative event occurs in the market. Only 5.4% of respondents disagreed with the statement that these respondents reacted to price movement by selling or buying more coins from the market (Figure 6.9).

**I choose to hold when the market performance is poor.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 28 | 30.1 | 30.1 | 30.1 |
| | 1 | 45 | 48.4 | 48.4 | 78.5 |
| | 2 | 15 | 16.1 | 16.1 | 94.6 |
| | 3 | 4 | 4.3 | 4.3 | 98.9 |

| | | | | | |
|---|---|---|---|---|---|
| | 4 | 1 | 1.1 | 1.1 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.9 – Source: from the research

The next statement in Figure 6.10 asked the respondents about their behaviour regarding future price movement. This aims to test whether respondents take cautious movement and decision when it comes to cryptocurrency investment. Statistically, from the frequency analysis, 66.7% of the respondents cumulatively agreed and strongly agreed with the statement, which indicated that respondents consider historical prices or a particular event in the past when predicting future market movement. However, 25.8% of the respondents stayed neutral. Yet, 7.5% of the respondents were in disagreement and strong disagreement with the statement, that is, they did not refer to past cryptocurrency prices when forecasting future price movement or they did not predict future prices.

**I forecast changes in cryptocurrency prices in the future based on past cryptocurrency prices**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 24 | 25.8 | 25.8 | 25.8 |
| | 1 | 38 | 40.9 | 40.9 | 66.7 |
| | 2 | 24 | 25.8 | 25.8 | 92.5 |
| | 3 | 5 | 5.4 | 5.4 | 97.8 |
| | 4 | 2 | 2.2 | 2.2 | 100.0 |

| | | | | | |
|---|---|---|---|---|---|
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.10 – Source: from the research

The question from Figure 6.11 was designed to assess the shift in respondents' attitudes following a profit from cryptocurrency investment. The agreement rate was significantly high, with three-quarters of respondents agreeing that their attitude shifted after a prior gain. Only 16.1% of respondents chose neutral, indicating that they were unbiased when experiencing a profit from their investment. Intriguingly, less than 6% of respondents disagreed that they become more risk seeking following a gain.

**After a prior gain, I am more risk-seeking than before.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 26 | 28.0 | 28.0 | 28.0 |
| | 1 | 47 | 50.5 | 50.5 | 78.5 |
| | 2 | 15 | 16.1 | 16.1 | 94.6 |
| | 3 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.11 – Source: from the research

The question from Figure 6.12 was asked to assess the change in respondents' attitudes after a loss from cryptocurrency investment. In this question, the cumulative percentage for agree and strongly agree compared to the last question was slightly lower at 68.8%; 68.8% of the total sample agreed

that their attitude was affected after a prior loss. Nevertheless, one-fifth of the respondents stayed neutral when experiencing a loss. Yet, on the disagreement side, nearly 10% of the respondents denied that they become more risk averse after a prior loss.

**After a prior loss, I become more risk-averse than before.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 25 | 26.9 | 26.9 | 26.9 |
| | 1 | 39 | 41.9 | 41.9 | 68.8 |
| | 2 | 20 | 21.5 | 21.5 | 90.3 |
| | 3 | 7 | 7.5 | 7.5 | 97.8 |
| | 4 | 2 | 2.2 | 2.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.12 – Source: from the research

In respect of the fluctuations of the cryptocurrency market, the question in Figure 6.13 was designed to assess respondents' attitude and emotion when experiencing a substantial loss from their investment. Nearly 70% of the respondents agreed and strongly agreed that they are affected by a substantial loss, which indicates their perceptions were impacted. Moreover, 22.6% of the respondents were neutral on the statement, opining that they were neither affected by market performance nor by a substantial loss. Remarkably, more than 9% of all respondents were unaffected by a significant loss in cryptocurrency investment.

**I am affected by a substantial loss in my cryptocurrency investment.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 31 | 33.3 | 33.3 | 33.3 |
| | 1 | 32 | 34.4 | 34.4 | 67.7 |
| | 2 | 21 | 22.6 | 22.6 | 90.3 |
| | 3 | 7 | 7.5 | 7.5 | 97.8 |
| | 4 | 2 | 2.2 | 2.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.13 – Source: from the research

In Figure 6.14, the question inquired whether respondents' behaviour is influenced after suffering a loss. More than half of the respondents (58.1%) agreed that they changed their strategy following a previous loss, whereas 32.2% remained neutral on this statement, indicating that they do not need to change their investment strategy every time they lose money on cryptocurrency. More than 9% of the respondents disagreed with the statement that their behaviour and strategy are not affected after a prior loss.

**After a prior loss, I tend to avoid the same investing strategy.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 20 | 21.5 | 21.5 | 21.5 |
| | 1 | 34 | 36.6 | 36.6 | 58.1 |
| | 2 | 30 | 32.3 | 32.3 | 90.3 |
| | 3 | 8 | 8.6 | 8.6 | 98.9 |
| | 4 | 1 | 1.1 | 1.1 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.14 – Source: from the research

### 6.5.2. TECHNOLOGY – TRUST IN THE SYSTEM

In technological factors, the first question was regarding trust in the system security of cryptocurrency. The frequency analysis in Figure 6.15 demonstrated that less than 30% of respondents agreed that they have trust in the cryptocurrency system. Whilst the majority were neutral about this statement, which represents 43% of the respondents. Furthermore, about 30.1% of respondents were in disagreement that the security of blockchain and cryptocurrency system have their full confidence.

**I trust the security of Blockchain and cryptocurrency system.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 5 | 5.4 | 5.4 | 5.4 |
| | 1 | 20 | 21.5 | 21.5 | 26.9 |
| | 2 | 40 | 43.0 | 43.0 | 69.9 |
| | 3 | 22 | 23.7 | 23.7 | 93.5 |
| | 4 | 6 | 6.5 | 6.5 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.15 – Source: from the research

Moving forward, the link between millennial investors' perception and trust were investigated in the context of cybercrime. The statement in Figure 6.16 asked whether millennial investors feel safe on cryptocurrency platform since it is claimed to be impossible to hack, thanks to blockchain technology. The agreement from respondents was low (at 20.4%) showing that there is a lack of trust from respondents as only a small number of investors felt safe when interacting on a cryptocurrency platform. Nearly 40% of the respondents were neutral about this statement, which indicates they were uncertain about the security of cryptocurrency and there is a slight chance of doubting their money could be hacked by hackers. Notably, the portion of respondents who disagreed with this statement was similar to the number of respondents who stayed neutral. This indicated that the majority of millennial investors have a fear of being a victim of cybercrime on a cryptocurrency platform.

**I feel safe when investing/trading on cryptocurrency platform as it could not be hacked.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 3 | 3.2 | 3.2 | 3.2 |
| | 1 | 16 | 17.2 | 17.2 | 20.4 |
| | 2 | 37 | 39.8 | 39.8 | 60.2 |
| | 3 | 32 | 34.4 | 34.4 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.16 – Source: from the research

### 6.5.3. SOCIAL – FRIENDS AND FAMILY

In respect of social factors, the respondents were asked whether their friends', family's or colleagues' investment in cryptocurrency influenced their decision to invest. Figure 6.17 shows that more than half of the respondents (65.6%) strongly agreed and agreed that the decision to invest was significantly influenced by their peers and family. Moreover, 18.3% of respondents were neutral about this statement, which shows that influence from social factors was neither impacting their decision nor attracting them to invest in cryptocurrency. Yet, only 16.1% of respondents disagreed and strongly disagreed with this statement. This indicates the reason that some millennial investors invested in cryptocurrency had no correlation with their relatives,

friends or colleagues. Previous studies indicated that millennial investors trust others with their financial preparation and learn about cryptocurrency from friends, co-workers or family members (Ahmad, 2019; Tangwattanarat, 2018).

**I invest in cryptocurrency because of my friends/family/colleague.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 15 | 16.1 | 16.1 | 16.1 |
| | 1 | 46 | 49.5 | 49.5 | 65.6 |
| | 2 | 17 | 18.3 | 18.3 | 83.9 |
| | 3 | 10 | 10.8 | 10.8 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.17 – Source: from the research

Next, to further investigate millennial investors' behaviour and perception of others' selection of cryptocurrencies, the respondents were asked to elaborate their opinions about the statement below. The frequency analysis in Figure 6.18 showed that 61.3% of millennial investors agreed that others' selection of cryptocurrency coins influenced their decision. Furthermore, 27.9% of respondents were neutral opining that they were neither affected by others' choice nor interested in other investors' decisions in choosing the type of cryptocurrency. In contrast, more than 10% of respondents expressed that they disagreed with this statement.

**Other investors' decisions of choosing cryptocurrency coins have an impact on my investing decisions.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 7 | 7.5 | 7.5 | 7.5 |
| | 1 | 50 | 53.8 | 53.8 | 61.3 |
| | 2 | 26 | 28.0 | 28.0 | 89.2 |
| | 3 | 7 | 7.5 | 7.5 | 96.8 |
| | 4 | 3 | 3.2 | 3.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.18 – Source: from the research

Following the previous question, respondents were asked whether their perception and behaviour towards others' choice of cryptocurrency volume had an impact on their investing decisions. The results in Figure 6.19 showed that 52.7% of the respondents agreed that the amount of coins they would purchase had been influenced by others' selections. This proportion was lower than the number of respondents who agreed with the previous question. A third of the respondents were neutral, they were indifferent to others' decisions in volume of invested coins. Additionally, 14% of respondents were in disagreement that they were not impacted by other investors' decisions about the volume of cryptocurrency to invest.

**Other investors' decisions of the cryptocurrency volume have an impact on my investing decisions.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 8 | 8.6 | 8.6 | 8.6 |
| | 1 | 41 | 44.1 | 44.1 | 52.7 |
| | 2 | 31 | 33.3 | 33.3 | 86.0 |
| | 3 | 10 | 10.8 | 10.8 | 96.8 |
| | 4 | 3 | 3.2 | 3.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.19 – Source: from the research

### 6.5.4. GOVERNMENT – TAX SCHEME

The question in government factors investigated respondents' behaviour in cryptocurrency investment in the context of tax benefits. Figure 6.20 showed that half of the respondents strongly agreed and agreed that they invested in cryptocurrency because of this benefit. In other words, 50.5% of respondents' perception and behaviour towards tax benefits when investing in cryptocurrency were positive. Whilst 36.6% of respondents were neutral about this statement, which indicates they were unsure whether their investment decision is influenced by tax benefits. Furthermore, only a small portion of respondents (12.9%) disagreed with this statement. This could

be due to the regulation of the country that they are currently investing cryptocurrency in or because of personal reasons.

**My investment decision is influenced by tax benefits.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 29 | 31.2 | 31.2 | 31.2 |
| | 1 | 18 | 19.4 | 19.4 | 50.5 |
| | 2 | 34 | 36.6 | 36.6 | 87.1 |
| | 3 | 7 | 7.5 | 7.5 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.20 – Source: from the research

## 6.6. QUANTITATIVE ANALYSIS

In the quantitative analysis section of the study, key findings from the survey analysis will be highlighted. The goal of this chapter's quantitative analysis section is to use SPSS 28.0 for correlation and regression analysis. Correlation and regression analyses help determine the impact of factors on millennial investors' perceptions of cryptocurrency investment. The third objective of the study was to develop a regression model that demonstrates the relative influence of the identified factors on millennial investors' perceptions of cryptocurrency investment. By

employing regression analysis, the researcher can infer the influence of each factor on millennial investors' perceptions of cryptocurrency as an investment.

### 6.6.1. CORRELATION ANALYSIS

The purpose of correlation is to examine the degree of association between the variables under consideration. The correlation coefficient quantifies the degree of relationship between dependent variable and independent variables to illustrate the strength of their relation (Senthilnathan, 2019).

If a correlation is discovered between two or more variables of the research, it means that if there is a systematic change in one variable, the change will also occur in another variable of the research due to the interdependence of the variables of the research. The existence of a relationship or interdependence among the variables under consideration can be either positive or negative. If the relationship is positive, it means that when one variable increases, the other variable also increases. In the case of a negative relationship, however, if one variable increases, the other variable tends to decrease (Senthilnathan, 2019).

There are various statistical tools available for displaying the correlation between variables. In this thesis, SPSS was adopted since it is the most used statistical tool for performing correlation analysis. The correlation analysis in this research was measured by the Pearson correlation coefficient, which can range between +1 and −1; +1 indicates the strongest positive correlation between two or more variables of the study, while −1 indicates the strongest negative relationship between the variables of the study (Pedhazur and Schmelkin, 2013; Senthilnathan, 2019). The stronger the coefficient to either of these numbers, the stronger the correlation between the variables under study. If the value of the coefficient is close to zero, it indicates that there is no correlation between the variables of the research.

As mentioned earlier, SPSS is utilised to test the correlation between the dependent and independent variables for this thesis. The dependent variable is millennial investors' perceptions, whilst independent variables are economic, technological, social and government factors.

According to the new model formed from the qualitative stage, the variable price movement represents economic factor, trust in the system represents technological factor, friends and family represent social factor and tax scheme represents government factor.

To enhance the accuracy of this thesis, questions 13 and 14 in the survey were used to assess the price movement variable which demonstrated the influence of market performance on millennial investors' perceptions and the actions they had conducted. In particular, these questions identified whether millennial investors decided to hold or forecast the movement of the market, or whether their attitude changed after a certain impact from the price movement, such as a gain or a loss.

For trust in the system, questions 16 and 17 were established to test the level of trust that would affect millennial investors' perceptions of cryptocurrency investment under the categories of cybercrime and the security of the system.

Next, question 18 was formed to identify the influence of social norms (i.e., friends and family) on millennial investors' perception and behaviour in cryptocurrency investment. The first area aimed to assess whether friends and family were the reason that millennial investors were attracted to invest in cryptocurrency. Secondly, both perception and behaviour of millennial investors were tested according to others' decision in the type of cryptocurrency or the volume of coins purchased.

Moreover, the tax scheme variable was tested by using question 22 which focused on tax benefits. This was presented to identify whether tax benefits had an impact on millennial investors' perception in considering cryptocurrency investment.

Therefore, below is the regression set up for this thesis:

$$Mper = \alpha + \beta 1pm + \beta 2tr + \beta 3fam + \beta 4\text{ts} + \mu$$

Where:

- $Mper$ is the dependent variable that stands for millennial investors' perceptions of cryptocurrency as an investment.
- $pm$ (price movement), $tr$ (trust in the system), $fam$ (friends and family) and ts (tax scheme) are the independent variables or explanatory variables.
- $\mu$ are the random errors of the models of which variance is assumed to be homoscedastic, mean equals zero and contains no contemporaneous correlation.

According to the results in Chapter 6, the millennials decision model suggests a regression equation of:

$$Mper = 12.326 + 0.390\ pm + 0.153\ tr + 0.335\ fam + 0.050\ \text{ts}$$

New hypotheses are going to be tested in this section:

H1: There is no correlation between millennial investors' perception and economic factors (price movement).

H2: There is no correlation between millennial investors' perception and technological factors (trust in the system).

H3: There is no correlation between millennial investors' perception and social factors (friends and family).

H4: There is no correlation between millennial investors' perception and government factors (tax scheme).

Figure 6.21 signifies the correlation between the variables of the research, which are price movement, friends and family, trust in the system and tax scheme, and millennial investors' perceptions of cryptocurrency investment. The first four variables are the independent variables of the research and the latter one is the dependent variable of the research. The significant values which are important in order to analyse the correlation among the variables under study are the value of Pearson coefficient and the significance value. According to the aforementioned context, the Pearson correlation coefficient can range between +1 and −1. If the Pearson value is closer to +1, it will indicate that the relationship among variables is strong.

**Correlations**

| | | price_movement | trust_of_the_system | friends_and_family | tax_scheme | millennial investors' perception |
|---|---|---|---|---|---|---|
| price_movement | Pearson Correlation | 1 | .943** | .893** | .738** | .940** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| trust_of_the_system | Pearson Correlation | .943** | 1 | .865** | .781** | .790** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Sig. (2- | .000 | | .000 | .000 | .000 |
| | | | 93 | 93 | 93 | 93 |
| friends_and_family | Pearson Correlation | .893** | .865** | 1 | .728** | .739** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| tax_scheme | Pearson Correlation | .738** | .781** | .728** | 1 | .734** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| millennial investors' perception | Pearson Correlation | .940** | .790** | .739** | .734** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 93 | 93 | 93 | 93 | 93 |

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 6.21 – Source: from the research

For the first independent variable (price movement), the value of Pearson coefficient is 0.940 which means there is a strong relationship between millennial investors' perception and price movement. In other words, the relationship of price movement and millennial investors' perception is 94% strong. The trust in the system variable also presented a strong relationship with the dependent variable at 79%. Next, the independent variable friends and family and the dependent variable millennial investors' perception evidently form a strong relation with a Pearson coefficient of 0.739. Last, tax scheme and millennial investors' perceptions of cryptocurrency investment also have a strong relationship. The Pearson coefficient for this relationship is 0.734, which means the interdependence of regulation and millennial investors' perception is 73.4% strong.

Therefore, it can be said that the independent variables of the study are positively correlated with the dependent variable. This indicates that there might be a significant influence of price movement, trust in the system, friends and family, and tax scheme on millennial investors' perceptions of cryptocurrency investment.

### 6.6.2. REGRESSION – MULTIPLE REGRESSION ANALYSIS

Multiple regression is a statistical method for analysing the relationship between a single dependent variable and a number of independent variables. Multiple regression analysis aims to predict the value of a single dependent variable based on the known values of the independent

variables. Each predictor value is assigned a weight, with the weights representing the predictor's relative contribution to the overall prediction (Schroede et al., 2017). Moreover, a regression analysis is a statistical process performed by a researcher to estimate the relationship that exists between the variables of the study. To be more specific, regression analysis assists the researcher to understand the change in the dependent variable of the research when any one of the independent variables is changed while the other variables remain constant (de Vaus, 2013). The most common regression model consists of an independent variable, a dependent variable, and unknown parameters. It essentially denotes the presence of relationships between variables and unknown parameters in the research.

Certain assumptions must be considered when performing regression analysis. One of the most important assumptions is that the sample selected for the regression analysis effectively represents the entire population. Another crucial assumption is that error is a random variable that cannot be explained. Finally, the nature of independent variables is independent in literal terms, which means that no predictor can be expressed as a linear combination of others (Schroede et al., 2017).

The researcher employed the statistical software SPSS in order to conduct the regression analysis for this study. In this thesis, the independent variables are price movement, trust in the system, friends and family, and tax scheme. Millennial investors' perceptions are the dependent variable. Furthermore, the purpose of the regression analysis is to determine the change in millennial investors' perceptions of cryptocurrency investment under the influence of price movement, trust in the system, friends and family, and tax scheme. The data were gathered using a survey questionnaire in which 93 respondents were asked questions about the research's major variables that was conducted from the qualitative phase's results.

### 6.6.3. MODEL SUMMARY

The regression analysis performed for this study is summarised in Figure 6.22. R and R squared are two essential values for this study. The value of R represents the relationship among all

variables included in the research. In contrast, the value of R squared indicates the combined effect of all independent variables on the dependent variable of this research. This research's R value demonstrates the relationship between millennial investors' perception and economic, technological, social and government factors. R squared value indicates the effect of economic, technological, social and government factors on millennial investors' perceptions of cryptocurrency investment. The value of R is 0.910 which means that there is 91% relationship among all the variables of the research (see figure 6.22). Moreover, the R squared of this research is 89% which means that there is a strong impact of price movement, trust in the system, friends and family, and tax scheme on millennial investors' perception.

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .954[a] | .910 | .890 | .2654 |

a. Predictors: (Constant), tax_scheme, price_movement, trust_of_the_system, friends_and_family

b. Dependent Variable: millennial investors' perception

Figure 6.22 – Source: from the research

### 6.6.4. ANALYSIS OF VARIANCE (ANOVA)

Figure 6.23 displays the ANOVA table. In this ANOVA table, the two most important values are the significance value and the F value. The significance value indicates the importance of the

relationship among research variables. On the other hand, the F value indicates the fitness of value of the model. The greater the F value, the more appropriate the research model. Moreover, the results of this thesis are significant since the significant value is 0.000, which is less than the alpha value of 0.05.

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 192.168 | 4 | 48.042 | 667.25 | .000[b] |
| | Residual | 6.336 | 88 | .072 | | |
| | Total | 198.504 | 92 | | | |

a. Dependent Variable: millennial investors' perception

b. Predictors: (Constant), tax_scheme, price_movement, trust_of_the_system, friends_and_family

Figure 6.23 – Source: from the research

## 6.7. HYPOTHESES TESTING

The study's regression analysis was conducted in order to determine the impact of the four independent variables on millennial investors' perception. To achieve this, a set of null hypotheses were tested to identify the significance level between each independent variable and the dependent variable.

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 12.326 | 3.195 | | 3.860 | .000 |
| | price_movement | .390 | .075 | .370 | 5.253 | .000 |
| | trust_of_the_system | .153 | .147 | .088 | 1.037 | .000 |
| | friends_and_family | .335 | .073 | .347 | 4.607 | .000 |
| | tax_scheme | .050 | .062 | .054 | .801 | .010 |

a. Dependent Variable: millennial investors' perception

Figure 6.24 – Source: from the research

### 6.7.1. HYPOTHESIS 1

Hypothesis 1 was related to the testing of differences between millennial investors' perception and the economic factor. It is shown in Figure 6.24 that the independent variable is significant at 5%

since the p-value is 0.000. The finding suggested that price movement has a significant impact on millennial investors' perception when they are investing in cryptocurrency. Moreover, beta values in Figure 6.24 are the estimated coefficients of the explanatory variables indicating a change in response variable caused by a unit change of respective explanatory variable, keeping all the other explanatory variables unchanged. With price movement, the beta value is 0.390 which means that one unit of change in price movement brings about 0.390 units change in millennial investors' perception.

### 6.7.2. HYPOTHESIS 2

Hypothesis 2 was related to the testing of the significance level of the technological factor on millennial investors' perception of cryptocurrency investment. At a significance level of 5%, technological factor has a low p-value, which is smaller than 0.05, which indicates that the null hypothesis is rejected. In other words, the results from Figure 6.24 show that there is a significant impact of trust in the system on millennial investors' perceptions of cryptocurrency as an investment. Likewise, the beta value of trust in the system is 0.153 which means that one unit of change in trust in the system brings about change in millennial investors' perception by about 0.153 units.

### 6.7.3. HYPOTHESIS 3

Hypothesis 3 was related to the testing of the significance level of social factor on millennial investors' perceptions of cryptocurrency. At a significance level of 5%, the multiple regression showed there is a significant correlation between social factors and millennial investors' perceptions of cryptocurrency investment, as the p-value is 0.000. The beta value of friends and family is 0.335 which means that one unit of change in friends and family brings about change in millennial investors' perception of about 0.335 units.

### 6.7.4. HYPOTHESIS 4

Hypothesis 4 was related to the testing of significance level of government factor on millennial investors' perceptions of cryptocurrency investment. The p-value of 0.000 from Figure 6.24 indicated that tax scheme has a significant impact on millennial investors' perceptions of cryptocurrency as an investment. Moreover, the beta value of regulation is 0.050 which means that one unit of change in tax related to cryptocurrency investment brings about change in millennial investors' perception of about 0.050 units.

Hence, it can be said that the application of regression and correlation tests are found to be positive in the case of the price movement, trust in the system, friends and family, and tax scheme and their impact on millennial investors' perceptions of cryptocurrency.

## 6.8. CONCLUSION

In summary, a survey questionnaire was applied for the quantitative stage to meet the fourth objective of this study. The analysis of this study included a frequency analysis followed by correlation and multiple regression analysis. From the frequency analysis, it can be said that the majority of the respondents agreed they are influenced by price movement, trust in the system, friends and family, and tax scheme when investing in cryptocurrency. Furthermore, at the 5% level of significance, there exists enough evidence to conclude that all independent variables are significant. Price movement, trust in the system, friends and family, and tax scheme are useful as predictors of millennial investors' perceptions of cryptocurrency investment. The results of the quantitative stage support the results of the qualitative stage as the technological and government factors have a lower impact on millennial investors' perception compared to other variables. Additionally, it was found that half of the total respondents were interested in the market performance and initially invested because of monetary reasons. Along with the economic factor, friends and family is also one of the main reasons why millennial investors firstly adopted cryptocurrency and they had an impact on their perceptions of cryptocurrency investment.

Therefore, it can be said that the quantitative findings from correlation and regression and the qualitative findings from thematic analysis are similar.

# CHAPTER 7: DISCUSSION

In recent years, the emergence of cryptocurrency has disrupted traditional financial markets and garnered the attention of many investors, particularly millennials. During the COVID-19 pandemic, the cryptocurrency market was expected to change the dynamics of financial markets (Goodell and Goutte, 2021). Millennial investors provided evidence of this change since they invested in cryptocurrency as a hedging tool or to diversify their portfolio. Millennial investors are concerned about the cryptocurrency market as a shift in price is affecting their portfolios.

In this chapter, the main aim is to explain the establishment of Millennials Decision Model that built upon HDM and the integration of TPB and TAM. Following is the development of a regression model to test the relationship between millennial investors' perceptions and four main factors (economic, technological, social and governmental factors) that built upon the Millennials Decision Model. Furthermore, this chapter sets out to analyse the millennial investors' perceptions and behaviours of cryptocurrency as an investment method in the flow of TPB, TAM and HDM. It is achieving through the elaboration of results presented in Chapters 5 and 6. It will refer to prior works in the literature, and compare results and explain the results using a new model, which is called the Millennial Decision Model. Last but not least, an investigation of which determinants determine millennial investors' perceptions will be highlighted.

Based on the literature review presented in chapter 2, a conceptual framework was developed and presented in figure 3.1. The first stage of the study, which is qualitative method, tested the initial framework and led to the development of a new conceptual model. Afterwards, the new conceptual model – Millennials Decision Model was tested in the second stage of the study, which is quantitative, to verify the relationship between millennial investors' perceptions and independent variables. The new model provides a refined understanding of the factors that influence millennial investors' perception of cryptocurrency as an investment.

The conceptual model – Millennials Decision Model – is built according to the results from the first stage of the study, the qualitative stage. The initial conceptual framework (Figure 3.1), built on HDM (Kocaoglu, 2016), was used to form interview questions about millennial investors' perception and behaviour in cryptocurrency investment. By employing HDM for this thesis, the

author was able to capture the long-term and short-term objectives of millennial investors in cryptocurrency market. Additionally, HDM supported the author in finding which aspects define millennial investors' objectives in relation to cryptocurrency. These achievements were obtained through the first stage of the study, with initial data collection using a qualitative method, which led to a new model (Figure 7.1).

In figure 7.1, the boxes depict the most important variables gleaned from the qualitative results: "Price movement", "Trust of the system", and "Friends and family". Each of the variables described above is the primary element influencing millennial investors' perceptions of cryptocurrencies as an investment. "Price movement", for example, reflects the Economic factor; "Trust of the system" represents the Technological factor; and "Friends and family" represent the Social factor. The theme "influence from government" did not have a significant effect on millennial investors' cryptocurrency investment. Nonetheless, most interviewees in the qualitative phase come from countries that do not have well-structured regulations or policies related to cryptocurrency. Due to this reason, the author investigated this theme further in the quantitative stage. The remaining seven themes, which represented seven variables in Figure 3.1, were discarded due to their irrelevant impacts. The omitted items are "fees" and "sending money abroad" from economic factors, "access to public ledger" and "no third-party controls" from technology factors, "news" and "project information" from social factors, and "political risks" from government factors. These removals are uncorrelated with previous work from Alzahrani and Daim (2019), AlShamsi and Andras (2019), Khairuddin et al. (2016), Sas and Khairuddin (2015), Zhang et al. (2019) and Tangwattanarat (2018). From previous work, a fast transaction process with lower fees and cheap money transfer were the main reasons why users chose Bitcoin (AlShamsi and Andras, 2019; Alzahrani and Daim, 2019). Moreover, the introduction of decentralised technology and free access to public ledger were found to be two of the main aspects empowering users to adopt cryptocurrency (Khairuddin et al., 2016; Sas and Khairuddin, 2015). However, millennial investors in this thesis were aware of those categories but they were not influenced by them. Although millennial investors' decision-making process from the qualitative phase was influenced by their perceptions of usability as in AlShamsi and Andras (2019), they did not take into account the power of taking control, news, project information or government factors as in AlShamsi and Andras (2019), Khairuddin et al. (2016), Sas and Khairuddin (2015), Zhang et al. (2019) and Tangwattanarat (2018).

On the other hand, the significance of “the influence of friends”, “the impact of price movement” and “trust in cryptocurrency system” from the qualitative phase were retained for the new model.

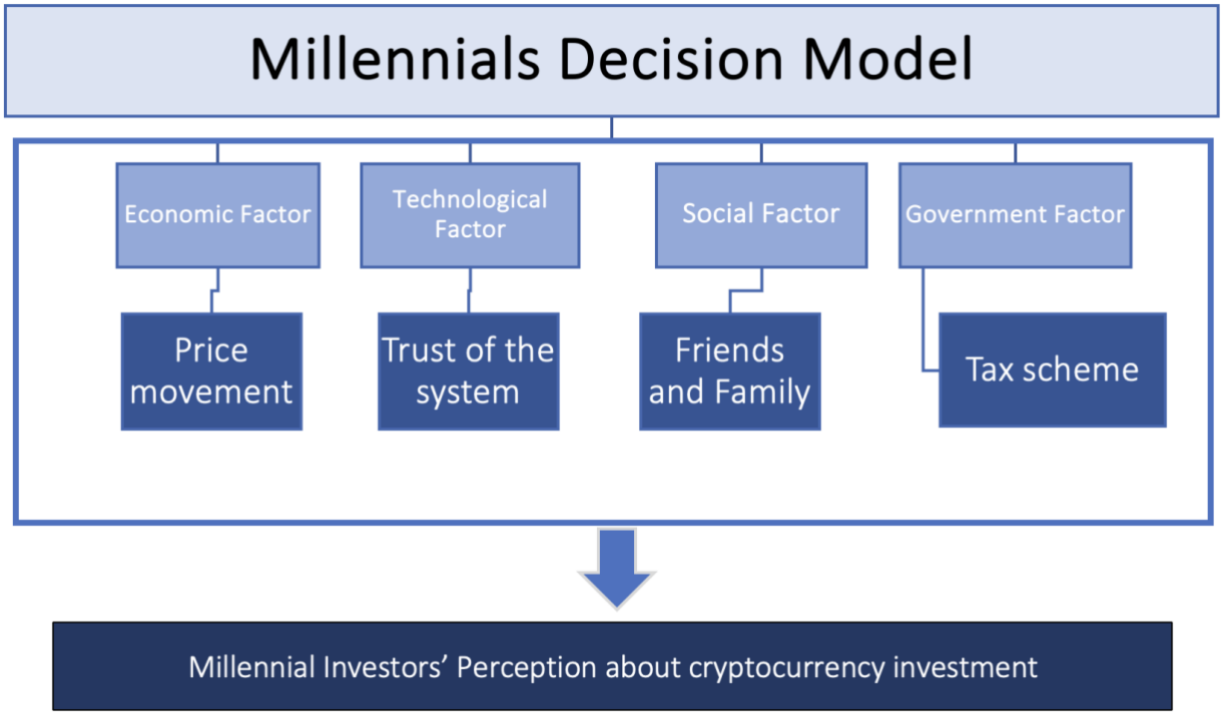


Figure 7.1 – Millennials Decision Model - Source: from the research

The new model in figure 7.1 provides a concise view of millennial investors' decision making which altered HDM (Kocaoglu, 2016). The HDM comprises multiple layers, beginning with missions and extending to objectives, goals and factors. However, the HDM model may be perceived as overly complex, which could lead to confusion among researchers and analysts. My model – Millennials Decision Model – recognises that goals are defined based on the changing perspectives and expectations of millennial investors as they gain experience with cryptocurrency investments. Combining this with the underpinning theories (TPB and TAM), it drew out a clearer picture on how my model is suitable for studying perceptions and attitudes. The new conceptual model and theoretical framework highlights the interplay between social, economic, and technological factors in shaping the attitude of millennial investors towards cryptocurrency investment. In the context of cryptocurrency, the adoption of cryptocurrency investment among millennial investors has been influenced by a multifaceted set of economic and social factors. At the outset of their investment journey, the perception of the cryptocurrency market was largely

influenced by perceived risks and opportunities. As they ventured into this new realm of investment, millennial investors developed specific objectives, such as earning profits and generating returns, reflecting their aspirations for financial growth.

Four main factors played a crucial role in shaping the perception and behaviour of millennial investors in the cryptocurrency market. These factors, although varied in nature, have a notable impact on the decision-making process of investors. However, with increasing experience in the market, millennial investors began to develop a more nuanced understanding of the market and to establish long-term goals for their investment strategies.

New hypotheses established from the Millennials Decision Model are tested. Each hypothesis examines the relationship between an independent variable (economic, technological, social and government) and millennial investors' perceptions of cryptocurrency investment. Furthermore, the new hypotheses are tested by a regression model demonstrated below.

$$Mper = \alpha + \beta 1pm + \beta 2tr + \beta 3fam + \beta 4\text{ts} + \mu$$

Where:

• $Mper$ is the dependent variable that stands for millennial investors' perceptions of cryptocurrency as an investment.

• $pm$ (price movement), $tr$ (trust in the system), $fam$ (friends and family) and ts (tax scheme) are the independent variables or explanatory variables.

• $\mu$ are the random errors of the models of which variance is assumed to be homoscedastic, mean equals zero and contains no contemporaneous correlation.

According to the results in Chapter 6, the Millennials Decision Model suggests a regression equation of:

$$Mper = 12.326 + 0.390\ pm + 0.153\ tr + 0.335\ fam + 0.050\ \text{ts}$$

Below are the new hypotheses for this research:

| **Hypothesis** | | **Outcomes** |
|---|---|---|
| 1 | There is a correlation between millennial investors' perceptions and economic factors (price movement) | Yes |
| 2 | There is a correlation between millennial investors' perceptions and technological factors (trust in the system) | Yes |
| 3 | There is a correlation between millennial investors' perceptions and social factors (friends and family) | Yes |
| 4 | There is a correlation between millennial investors' perceptions and government factors (tax scheme) | Yes |

Table 7.1. Summaries of the hypotheses' outcomes – Source: from the research

**a. Hypothesis 1: There is a correlation between millennial investors' perceptions and economic factors (price movement)**

The first hypothesis of the study was developed to find if there is correlation between millennial investors' perception and economic factors – price movement. Based on the significant value in the coefficient table, the significant value is below 0.05 for 95% confidence intervals which indicates a highly significant statistic correlation to millennial investors' perception.
For the first independent variable (price movement), the value of Pearson coefficient is 0.940 which means there is a strong relationship between millennial investors' perception and price movement. In other words, the relationship between price movement and millennial investors' perception is 94% strong. This indicates that price movement has a significant impact on how millennial investors perceive cryptocurrency as an investment. Moreover, the ANOVA significant value is 0.000 which is less than the acceptance value of 0.05, hence the result for this hypothesis is significant. From the regression equation, it is shown that if there is a 1% increase in the price movement of cryptocurrency market, the perception of millennial investors towards cryptocurrency investment will positively increase by 0.39% (beta value).

Moreover, results from descriptive analysis for questions 13 and 14 in the survey showed that economic factors, in particular, price movement, have a significant impact on millennial investors' perception. More than half of the respondents agreed that the price movement is considered when they invest in cryptocurrency. These findings relate to previous work from Glaser et al. (2014), Liu and Tsyvinsky (2021), Merkle (2018) and Bradbury et al. (2015). It was proved that the influence of investor attention on price is an important characteristic of cryptocurrency markets (Liu and Tsyvinsky, 2021). Moreover, cryptocurrency investors favour assets with strong skewness and are more inclined to chase patterns by regressing cryptocurrency investment on predictor variables for past occurrence of investment prejudices in transactions prior to individuals investing in cryptocurrencies (Lammer et al., 2019). In other markets, such as the stock market, investors' perceptions and investment decisions are driven by the stock prices (Ungeheur and Weber, 2020). Therefore, the relationship between millennial investors' perception and cryptocurrency market price is identical to that of other markets. According to Bradbury et al. (2015) and Merkle (2018), there is a correlation between price volatility and investors' perception, however, the impact of price volatility on investors' perception and allocation decisions is minor. In contrast, the impact of price movement on millennial investors' perceptions of cryptocurrency investment in this research is significant.

Millennial investors believe that historical price or a particular event in the cryptocurrency market occurred in the past will happen to the market in the future. This conclusion was clearly demonstrated in Figure 6.13, as 66.7% of participants referred to historical price when predicting future prices.

This thesis showed that cryptocurrency investors rely on their past experience to plan for their next investment decisions. The thinking process and behaviour of millennial investors from my paper is aligning with findings Yaser (2020). By using quantitative approach to study herding theory, prospect theory and heuristic theory among female Arab investors, Yaser (2020) found that cryptocurrency investors strongly believe in their investing skills. Importantly, cryptocurrency investors in Yaser (2020)'s research believe in past events that took place within cryptocurrency market will resurge. However, this belief could lead to regret since participants neglected the fact that there might be another factor besides historical price that could potentially affect the market.
What's more, the price movement of cryptocurrency market is proved to influence millennial investors' decisions and attitudes in both positive and negative ways. Nearly 80% of participants shared that they decided to hold when market performance is poor (Figure 6.12). This is aligned with Ungeheur and Weber (2020) as investors' perceptions and investment decisions are driven by the stock prices. Additionally, Silinskyte (2014) used the UTAUT model developed by Venkatesh et al. (2003) to understand users' usage behaviour toward Bitcoin. Their findings indicated that performance expectancy, effort expectancy, facilitating conditions and behavioural intention significantly influence the usage of Bitcoin. Likewise, this means that cryptocurrency investors act as speculators as they avoid selling when the market is unfavourable (Yaser, 2020).
In terms of profits, three-quarters of participants who answered this thesis's questionnaire claimed that there is a shift in their attitudes following a profit from cryptocurrency investment. In particular, millennial investors became more risk seeking than before when they gained a return from cryptocurrency. Figure 6.14 indicates that the majority of millennial investors have higher financial risk tolerance after gaining returns. Likewise, participants in the questionnaire were asked whether their attitude changes after facing a loss from cryptocurrency investment. In this scenario, Figure 6.15 shows that the cumulative percentage of participants that had changed their perception was slightly lower than the previous case. Yet, nearly 10% of the participants denied that they become more risk averse after a prior loss. From these results, millennial investors' attitude was strongly influenced by changes in return or loss that they had experienced. Although their perceived risk level was calculated in terms of self-reported financial risk tolerance, there existed

a correlation between monetary returns and their perceptions of cryptocurrency. This means that investors in the cryptocurrency market will be more involved in buying more assets when they succeed in their former investments. Previous success in cryptocurrency investment could determine investors' behaviour as in Yaser (2020). In this study, millennial investors will gradually become risk takers. The statement "After a prior loss, you become more risk averse" recorded a mean value of 3.80 with a standard deviation value of 0.78. This result indicates that when the cryptocurrency market goes down, investors will pay attention to the risk aspect and become risk averse.

With respect to the fluctuation of cryptocurrency market, millennial investors' attitude and emotions are heavily influenced by substantial loss and it may change their investing strategies. Nearly 60% of participants shared that they changed their investing strategies after experiencing a substantial loss. This correlated with Yaser (2020), when Arab women would not make investment decisions if they lost money in cryptocurrency market.

In general, there is a relationship between price movements and millennial investors' perceptions of cryptocurrency investment. This relationship is in line with the findings of previous studies from Liu and Tsyvinsky (2021), Merkle (2018), Bradbury et al. (2015) and Glaser et al.'s (2014). It is proved that cryptocurrency investors would like to chase patterns that occurred in the previous market (Lammer et al., 2019). Concurrently, they favour assets with strong skewness (Lammer et al., 2019). In other markets, such as the stock market, investors' perceptions and investment decisions are driven by the stock prices (Ungeheur and Weber, 2020). Therefore, the relationship between millennial investors' perception towards cryptocurrency investment and cryptocurrency market price is identical to that in other markets. According to Bradbury et al. (2015) and Merkle (2018), there is a correlation between price volatility and investors' perception, however, the impact of price volatility on investors' perception and allocation decisions is minor. By contrast, it is demonstrated in this paper that price movment of cryptocurrency market has significant impact on millennial investors' perception of cryptocurrency investment.

**b. Hypothesis 2: There is a correlation between millennial investors' perceptions and technological factor (trust in the system)**

The second hypothesis of the study was associated with findings whether there is correlation between millennial investors' perception and technological factors – trust in the system. At the significant level of 5%, technological factor has a low p-value, which is smaller than 0.05, which indicates that hypothesis 2 is retained.

Moreover, the value of Pearson coefficient is 0.940, which means there is a strong relationship between millennial investors' perception and trust in the system. The beta value of trust in the system is 0.153, which means that a 1% change in the security of the cryptocurrency system would affect millennial investors' perception by 0.153%. Additionally, the ANOVA's significant value is 0.000, which is less than the acceptance value of 0.05, hence the result for this hypothesis is significant. This finding was initially captured from question 17 in the survey with different scenarios to gain deeper knowledge about millennial investors' perceptions of cryptocurrency security system.

Figure 6.18 showed that was less than one-third of participants agreed that they have trust in the cryptocurrency system. On the other hand, more than 40% of participants were uncertain about their trust in cryptocurrency system. Hence, it is suggested that security of cryptocurrency system is a significant barrier for millennial investors when investing in cryptocurrency. Additionally, the findings about relationship between security statement and millennial investors' perceived trust aligns with Hanzaee and Alinejad's (2012) results. They studied e-payment security with online banking in Iran; they found that perceived security was positively associated with consumers' perceived trust. This is comparable with Kim et al. (2020) who found that perceived security is determined by security statements, and with Andrade et al. (2012) who found that privacy statements and security signs affect trust. By using SEM, Ooi et al. (2021) found that perceived security and perceived trust are the areas of focus of increasing Bitcoin use. Furthermore, they identified that technical protections, transaction procedures and security statements are the main factors of perceived trust in Bitcoin.

In relation to cybercrime, millennial investors do not feel safe on cryptocurrency platforms despite the impossibility of ransomware with blockchain. Figure 6.19 shows that 40% of participants disagreed that they feel safe with cybercrime on cryptocurrency platforms. The percentage is similar to the number of participants who were uncertain about the chance of cyberattack on cryptocurrency platforms.

Comparing literature reviews, this thesis has the same findings as Khairuddin (2019) and Parashar and Rasiwala (2018) since the fear of cybercrime affects users' behaviour and their awareness of Bitcoin.

### c. Hypothesis 3: There is a correlation between millennial investors' perceptions and social factors (friends and family)

The third hypothesis was related to the testing of significance level of social factor on millennial investors' perceptions of cryptocurrency. At a significance level of 5%, the regression showed that there is a significant correlation between social factor and millennial investors' perceptions of cryptocurrency investment. This relationship is strengthened by the value of Pearson coefficient, which is 0.940. From the regression analysis, the beta of friends and family is 0.335 which means that one unit change in friends' and family's behaviour would bring about change in millennial investors' perception of about 0.335 units. Furthermore, the significant value of an ANOVA was 0.000, which is less than the acceptance value of 0.05, hence the result for this hypothesis is significant.

Figure 6.20 of question 18 showed that more than half of the participants agreed that their decision to invest in cryptocurrency was significantly influenced by their peers and family. This aligns with Nugraha and Prasetyaningtyas (2023), Ahmad (2019), Moueed and Hunjra (2019) and Tangwattanarat (2018) as cryptocurrency investors trust others with their financial preparation and learn about cryptocurrency from friends or co-workers. Additionally, Abraham (2020) concluded irrational investors buy Bitcoin based on social influencers or family and friends, whilst Bitcoin's rational investors value the cryptocurrency through the performance of blockchain applications. In contrast, Craggs's (2017) findings differed since social networks, friends or family did not have a significant impact on cryptocurrency investors. This result agrees with the previous study of Bashir et al. (2016) in which friendship networks were proved to be not an important predictor of Bitcoin attitudes among users.

In terms of selecting coins to invest, the majority of participants claimed that others influenced their decision (Figure 6.21). The tendency of following or copying other investors' action might be influenced by participants' emotion and instinct. Furthermore, one-third of participants were neutral, opining that they were neither affected by others' choices nor interested in other investors' decisions in choosing the type of cryptocurrency (Figure 6.21). This suggests that 30% of participants partially feel confident in their own judgements and perceptions about cryptocurrency investment. However, a lack of introspection could cause millennial investors to think and behave in a similar fashion to everyone around them. By the same token, millennial investors' perception was influenced by their peers' decision of the cryptocurrency volume to buy or sell on cryptocurrency market. The regression analysis showed that more than 50% of the second sample agreed that the amount of coins they would purchase had been influenced by others' selections (Figure 6.22). Millennial investors follow what they perceive other investors are doing rather than relying on their own analysis. In other words, millennial investors are prone to a herd mentality, that is, conforming to the activities and direction of other cryptocurrency investors in multiple ways. This could be due to the FOMO on a profitable investment as it is the driving force behind this belief and behaviour of millennial investors. It is natural for human beings to want to feel they are part of a shared socio-economic norm. Boxer and Thompson (2020) shared similar findings; they concluded that the influence of others was the second strongest predictor of cryptocurrency investors' attitudes towards cryptocurrency investment. Boxer and Thompson (2020) stated that investors who are more aware of others' investments in cryptocurrency will have a greater tendency to imitate their behaviour in their investments. Although my thesis and Boxer and Thompson (2020) shared identical results in terms of social aspects, cryptocurrency investors in Boxer and Thompson (2020) were not influenced by others' knowledge and choices in choosing type of coins or trade volume.

In summary, there is a significant correlation between millennial investors' perceptions and social factors. In comparison with previous papers, this research's findings are the same as Abraham (2020), Moueed and Hunjra (2019), Alzahrani and Daim (2019), Ahmad (2019), Tangwattanarat (2018) and Subash (2012). From Ahmad's (2019) paper, Generation X and millennials trust others with their financial preparation. The willingness to adopt cryptocurrency and Bitcoin from cryptocurrency investors if their peers adopt them is also demonstrated (Tangwattanarat, 2018; Alzahrani and Daim, 2019). Furthermore, findings from this thesis that irrational investors were

recorded buying cryptocurrency based on social influence of friends and family were also captured in Abraham (2020).

**d. Hypothesis 4: There is a correlation between millennial investors' perceptions and government factors (tax scheme)**

The final hypothesis was established to test the relationship between millennial investors' perception and government factors in cryptocurrency investment. At 5% significant level, hypothesis 4 is retained as there is a correlation between millennial investors' perception and government factors.

The value of Pearson coefficient is 0.940, which means there is a strong relationship between millennial investors' perception and government factors. Moreover, the beta value of tax scheme is 0.050 which means that a 1% change in cryptocurrency's taxation brings about 0.05 % change in millennial investors' perception. Likewise, the significant value of the ANOVA is 0.000, which is less than the acceptance value of 0.05, hence the result for this hypothesis is significant.

Findings from question 21 in the questionnaire also confirmed this outcome. It was revealed that half of the respondents strongly agreed that they invested in cryptocurrency because of tax benefits (Figure 6.23). The tax scheme varies based on each country; half of the participants in the quantitative stage may invest in or reside in countries that have a supportive tax scheme towards cryptocurrency investment. In terms of permission to trade from government, it did not have a significant influence on how millennial investors perceive cryptocurrency as an investment. It was revealed that millennial investors would continue investing cryptocurrency despite restrictions that may be introduced by the government in the future. Meyer et al. (2014) declared that the introduction of a financial transaction tax had a significant impact on investors' behaviour in France. The tax scheme had a strong impact on trading behaviour in the affected stocks, which drove investors' decision in the stock market. Coşkun and Bekçioglu (2018) drew the same conclusion when they tested the influence of taxation on the financial decisions of Turkish business investors based on the Tax Incentive Law. Therefore, the findings from this thesis are aligned with the previous study in terms of how tax schemes influence investors' decisions in a certain market. Furthermore, after a period of investing in cryptocurrency, millennial investors started to develop

perceptions about particular regulations that may affect their investment. Some millennial investors based in countries that do not have restrictions or regulations on cryptocurrency considered this type of investment as a tax haven to conceal their earnings. On the other hand, millennial investors who invested in other markets and had got used to paying tax on capital gains shared that they did not pay attention to this area when it comes to cryptocurrency investment.
Governmental acceptance may help cryptocurrency to accelerate, and a more positive attitude from new and current investors might be established. Considering the case of China, the nation bans its citizens from any activities related to cryptocurrency as they are protecting their economic policy sovereignty. However, millions of Chinese investors still trade Bitcoin through overseas exchanges or through local brokers (Gkritsi, 2021). This case is not in line with the thesis's findings as millennial investors are prone to stop investing in cryptocurrency if there is no permission to trade.

In general, results from Figure 27 indicated that tax scheme has a significant impact on millennial investors' perceptions of cryptocurrency as an investment. This aligns with findings from Meyer et al. (2014) and Coşkun and Bekçioglu (2018); both studies showed that the introduction of a financial transaction tax had a significant impact on investors' behaviour.

To verify the exploratory power of Millennials Decision Model, results from chapter 5 and 6 has demonstrated there are correlations in the explanation of the factors recorded in Millennials Decision Model with the theoretical framework. There is, also, strong relationship between millennial investors' perceptions and independent variables (i.e. economic factors, technological factors, social and governmental factors). In particular, economic factors are the most important determinant of millennial investors' perceptions of cryptocurrency investment. In other words, economic factors are considered to be the most important element in the millennial decision model and are part of cryptocurrency's PU according to millennials. This finding correlates with previous studies from Alzahrani and Daim (2019), Lammer et al. (2019) and Kim et al. (2020), while it is in contrast to Linh Bui (2022), Tangwattanarat (2018) and Krafft et al. (2018) as social factors (friends and family) were found to be the most significant factor.

The first correlation point between qualitative and quantitative method is the perceived usefulness of investing in cryptocurrency that attracts millennial investors. In other words, PU in TAM complements attitude in TPB combining with significant influence from factors that structured in HDM has led millennial investors to invest in cryptocurrency. Findings from question 4 in qualitative phase revealed that most of the millennial investors decided to invest in cryptocurrency when they saw others making profits from cryptocurrency market. The first correlation in this thesis is related to Jariyapan et al. (2022) when PU was identified as a partial mediator of SN and the perceived ease of use. Jariyapan et al. (2022) contributed to the literature through the application of TAM 3 (an extension of the TAMs) to investigate the fundamental qualities a cryptocurrency should have to influence investors' behavioural intention to use it. On the other hand, it is in contrast with Sagheer et al. (2022) where PU is fully perceived by investors when they receive support from the government on cryptocurrency aspect.

Furthermore, results conducted from the questionnaire confirmed the belief of millennial investors that they would gain returns from cryptocurrency investment. Furthermore, 82% of the sample shared that they have become less risk averse over the period of investing in cryptocurrency market. At the same time, 94% of the participants from the survey claimed that their attitude and perception about cryptocurrency had changed since the first time they invested in it (results from question 24 and question 25 in Chapter 6). The growing potential of cryptocurrency to generate profits, coupled with the success stories of friends and acquaintances, led many people to shift their perception about investing in this technology from one of scepticism to one of boldness. As cryptocurrencies continue to gain acceptance and adoption, more people are becoming familiar with their potential as an investment vehicle. The market's performance, despite its volatility, has shown that significant returns can be achieved, which further increases interest in cryptocurrency investment. What's more, the price movement of cryptocurrency market is proved to influence millennial investors' decisions and attitudes in both positive and negative ways. Nearly 80% of participants shared that they decided to hold when market performance is poor (Figure 6.12). This is aligned with Ungeheur and Weber (2020) as investors' perceptions and investment decisions are driven by the stock prices. Additionally, Silinskyte (2014) indicated that performance expectancy, effort expectancy, facilitating conditions and behavioural intention significantly influence the usage of Bitcoin. Additionally, the results of this thesis are related to the results of Bui (2022) who researched investors' behaviour in the cryptocurrency market. Bui (2022) applied TRA (Fishbein

and Ajzen, 1975) and TAM (Davis, 1989) with efficient market hypothesis. Bui (2022) pointed out that volatility in prices causes investors to engage in rapid sales and purchases. In particular, when prices decrease significantly, new investors might be encouraged to enter the market and vice versa.

A more in-depth exploration from Hasso et al. (2019) and Gurdgiev and O'Loughlin (2020) identified that cryptocurrency investors have a high degree of risk aversion, and at times of rising prices there is an increase in the volume of users trading cryptocurrency. Hasso et al. (2019) observed that investors were more likely to engage in cryptocurrency trading from January to March 2017. However, the proportion and number of investors who executed trades were lower in April and peaked in the last quarter of 2017 (Hasso et al., 2019). To evaluate Hasso et al.'s (2019) findings, the author reviewed the historical price movements during 2017 on CoinMarketCap. During the first two quarters, Bitcoin price increased from $998 to $1267 and peaked at $11,323 in December (CoinMarketCap, 2017). A steady increase in Bitcoin price for the first half of 2017 resulted in a moderate trading activities as captured in Hasso et al. (2019). And when the price went up dramatically in December 2017, it attracted investors to participate in the cryptocurrency market.

In the context of this thesis, the majority of respondents in the qualitative phase started investing in cryptocurrency by the end of the second quarter of 2020. According to CoinMarketCap, the price of Bitcoin increased rapidly from £6791 to £9759 in quarter 2, which equals to a rise of 43.7% in price movement. Therefore, there could be a possibility that the millennial investors witnessed a dramatic increase in the coin price and that this attracted them to invest in cryptocurrency. One of the early millennial investors mentioned that "I saw the price plumped up quickly, that's why I decided to invest in" (Respondent H). This respondent started to invest during the first quarter of 2021, when Bitcoin price increased 56%.

Hence, factor structured in conceptual model – price movement – determines on millennial investors' perceived usefulness and their attitudes which have affected their perceptions in cryptocurrency market.

Not to mention, perceived ease of use (from TAM) connects with perceived behaviour control (from TPB) to synergistically influence millennial investors' attitudes and perceptions toward cryptocurrency investment. For the purpose of adopting cryptocurrency as an investment, it is suggested from chapter 5 and 6 that millennial investors will invest in cryptocurrency when they think it is safe and easy to use. Questions 9, 10 and 11 from the qualitative stage were asked to measure respondents' risk attitude and the degree of importance of this theme among millennial investors. From the data collected, all respondents had awareness about the security of cryptocurrency system.

Respondents shared that the technical protection mechanisms for cybercrime affected their perceived risk level when investing in cryptocurrency. Respondent B shared that he stored capital gains from cryptocurrency investment in a cold wallet since he did not trust the security. On the other hand, respondent E stored crypto coins directly on the chain as he only invested small amounts. This further suggested that respondent E did not entirely trust the cryptocurrency system because he only invested small amounts in this market, while he was investing in the stock market. The results obtained in this thesis correlate with previous researchers' (Oney et al., 2017; Ooi et al., 2021) results as users' perceptions of security and their trust in the system had a relationship with the security system of cryptocurrency. Nevertheless, Ooi et al. (2021) proved that technical protection had a positive effect on users' perceived security but could not explain how users had perceived trust in Bitcoin. Compared to this thesis, millennial investors expressed a negative attitude towards cryptocurrency system security according to their preference of using external storage for coins. Moreover, millennial investors fully presented their perceived trust level during interviews, which contrasts with Ooi et al. (2021). Therefore, with coverage of 38.02% in NVivo from qualitative phase, it is recognised that trust in the cryptocurrency system has a strong correlation with millennial investors' perceptions of cryptocurrency investment.

From quantitative stage, the second hypothesis of the study was associated with findings whether there is correlation between millennial investors' perception and technological factors – trust in the system. At the significant level of 5%, technological factor has a low p-value, which is smaller than 0.05, which indicates that hypothesis 2 is retained. Figure 6.18 showed that was less than one-third of participants agreed that they have trust in the cryptocurrency system. On the other hand, more than 40% of participants were uncertain about their trust in cryptocurrency system. Hence, it is suggested that security of cryptocurrency system is a significant barrier for millennial investors

when investing in cryptocurrency. Additionally, the findings about relationship between security statement and millennial investors' perceived trust aligns with Hanzaee and Alinejad's (2012) results. They studied e-payment security with online banking in Iran; they found that perceived security was positively associated with consumers' perceived trust. This is comparable with Kim et al. (2020) who found that perceived security is determined by security statements, and with Andrade et al. (2012) who found that privacy statements and security signs affect trust. By using SEM, Ooi et al. (2021) found that perceived security and perceived trust are the areas of focus of increasing Bitcoin use. Furthermore, they identified that technical protections, transaction procedures and security statements are the main factors of perceived trust in Bitcoin. In relation to cybercrime, millennial investors do not feel safe on cryptocurrency platforms despite the impossibility of ransomware with blockchain. Figure 6.19 shows that 40% of participants disagreed that they feel safe with cybercrime on cryptocurrency platforms. The percentage is similar to the number of participants who were uncertain about the chance of cyberattack on cryptocurrency platforms. Comparing literature reviews, this thesis has the same findings as Khairuddin (2019) and Parashar and Rasiwala (2018) since the fear of cybercrime affects users' behaviour and their awareness of Bitcoin.

In accordance with the theoretical framework, the results from mixed-methods validates the interconnection between perceived ease of use and PBC affects one's perception. It is demonstrating its applicability and enhancing the explanation power of 'trust in the system' on millennial investors' perception in cryptocurrency market.

The second correlation is how millennial investors' perception of cryptocurrency had changed throughout their actual experience. A shift was clearly demonstrated from their previous negative perception of cryptocurrency, such as "is too risky" and "there is no intrinsic value", to "I decided to invest some of my money" from respondent A, which was strictly linked to millennial investors' behavioural beliefs. Theoretically, the PU of cryptocurrency investment and the excitement related to money changed millennial investors' perceptions of cryptocurrency investment. Interestingly, the majority of millennial investors in the qualitative stage had less than 2 years of experience with cryptocurrency. This suggests that they might be in a period of learning and transiting their perceptions through events with cryptocurrency. Likewise, they tended to rely on others' opinion

in their decision-making process. 90% of respondents shared in the interview that they invested in cryptocurrency because of their friends. Moreover, the theme "the influence of friends" emerged as the most significant theme with 56.8% coverage referenced to the theme in NVivo 12 (see Chapter 5). In Tangwattanarat's (2018) research about the perception of cryptocurrency investors in Thailand, the scholar also found that the majority of interviewees learned about cryptocurrency from friends, family members and colleagues. Furthermore, Boxer and Thompson (2020) studied attitudes and behaviours of 130 active cryptocurrency investors and focused on the social aspects. Their findings indicated that social norms, propensity to imitate others and a dimension of herd behaviour strongly influence attitudes towards cryptocurrency behaviour and subsequent behaviours. They found that people have a more positive attitude towards cryptocurrency when their social group of family, friends and peers view cryptocurrency positively. In this thesis, millennial investors from qualitative phase demonstrated a positive shift in their attitudes of cryptocurrency investment when their friends had a positive experience with this market. In other words, millennial investors started to invest in cryptocurrency because their friends and family were also investing in this field. These results correlate with Walton and Johnston (2018), Ryu and Ko (2019) and Alzahrani and Daim (2019). Therefore, social factors or SN in this paper were proven to attract millennial investors' perceived usefulness in cryptocurrency, which have altered their attitudes before and during cryptocurrency investing.

Furthermore, findings conducted from quantitative method demonstrated that nearly 100% of millennial investors become more risk seeking after a gain from cryptocurrency market. To put it differently, there is a shift in their attitudes following a profit from cryptocurrency investment. Figure 6.14 indicates that the majority of millennial investors have higher financial risk tolerance after gaining returns. Likewise, participants in the questionnaire were asked whether their attitude changes after facing a loss from cryptocurrency investment. In this scenario, Figure 6.15 shows that the cumulative percentage of participants that had changed their perception was slightly lower than the previous case. Yet, nearly 10% of the participants denied that they become more risk averse after a prior loss. From these results, millennial investors' attitude was strongly influenced by changes in return or loss that they had experienced. Although their perceived risk level was calculated in terms of self-reported financial risk tolerance, there existed a correlation between monetary returns and their perceptions of cryptocurrency. This means that investors in the cryptocurrency market will be more involved in buying more assets when they succeed in their

former investments. Previous success in cryptocurrency investment could determine investors' behaviour as in Yaser (2020). In this study, millennial investors will gradually become risk takers. The statement "After a prior loss, you become more risk averse" recorded a mean value of 3.80 with a standard deviation value of 0.78. This result indicates that when the cryptocurrency market goes down, investors will pay attention to the risk aspect and become risk averse. With respect to the fluctuation of cryptocurrency market, millennial investors' attitude and emotions are heavily influenced by substantial loss and it may change their investing strategies. Nearly 60% of participants shared that they changed their investing strategies after experiencing a substantial loss. This correlated with Yaser (2020), when Arab women would not make investment decisions if they lost money in cryptocurrency market.

Additionally, a historical cryptocurrency price or a past cryptocurrency market event is strongly believed to reoccur in the future by millennial investors. This conclusion was clearly demonstrated in Figure 6.13, as 66.7% of participants referred to historical price when predicting future prices. It showed that cryptocurrency investors rely on their past experience to plan for their next investment decisions. The thinking process and behaviour of millennial investors from my paper is aligning with findings Yaser (2020). By using quantitative approach to study herding theory, prospect theory and heuristic theory among female Arab investors, Yaser (2020) found that cryptocurrency investors strongly believe in their investing skills. Importantly, cryptocurrency investors in Yaser (2020)'s research believe in past events that took place within cryptocurrency market will resurge. As a consequence, this belief could lead to regret since participants neglected the fact that there might be another factor besides historical price that could potentially affect price movement. However, Sukumaran et al. (2022) reported that perceived risk had no influence on Malaysian investors on cryptocurrency market, while perceived value had a significant impact on them. Pham et al. (2021) shared the same findings with my thesis since it was shown that Italian investors were impacted by their level of perceiving risk when investing in cryptocurrency.

Hence, it is concluded that millennial investors' perception constantly evolves through their experience with cryptocurrency. This emphasises the effect of 'price movement', 'friends and family' on millennial investors' perception before and throughout their investing journey. 'Friends and family' captured millennial investors' interest and leading their attention to 'price movement' to form the perception of usefulness. Following is the exploration in the cryptocurrency field to

navigate PBC and perceived risk that has altered millennial investors' decision-making process during the course of investing in cryptocurrency.

The final correlation is millennial investors abide by the government factors when investing in cryptocurrency market. Findings from qualitative phase show that millennial investors are aware of taxation policies on cryptocurrency investment of the country where they are currently active. In the quantitative method, findings in Figure 6.23 showed that half of the respondents strongly agreed and agreed that they invested in cryptocurrency because of this benefit. In other words, 50.5% of participants' perception and behaviour towards tax benefits when investing in cryptocurrency were positive. These results might relate to the geographical factor that depends on the country that millennial investors are currently investing in. On the other hand, the rest of the participants might pay tax on their capital gains, thus, they do not show interest in this factor. For example, profits from cryptocurrency speculation and mining are subject to a progressive income tax or will be taxed as non-commercial income in France (Hacioglu, 2019; Freshfields Bruckhaus Deringer, 2023). If individuals in the UK hold cryptocurrency for investment, cryptocurrency will be considered an asset, and capital gains are taxed. In terms of permission to trade from government, it did not have a significant influence on how millennial investors perceive cryptocurrency as an investment. It was revealed that millennial investors would continue investing cryptocurrency despite restrictions that may be introduced by the government in the future. Meyer et al. (2014) declared that the introduction of a financial transaction tax had a significant impact on investors' behaviour in France. The tax scheme had a strong impact on trading behaviour in the affected stocks, which drove investors' decision in the stock market. Coşkun and Bekçioglu (2018) drew the same conclusion when they tested the influence of taxation on the financial decisions of Turkish business investors based on the Tax Incentive Law.

Therefore, the findings from this thesis are aligned with the previous study in terms of how tax schemes influence investors' decisions in a certain market. Furthermore, after a period of investing in cryptocurrency, millennial investors started to develop perceptions about particular regulations that may affect their investment. From the perspective of the integration of TPB and TAM, it is further clarified that government factors act as PBC and perceived ease of use to determine millennial investors' attitude with cryptocurrency.

In conclusion, these findings were derived from the new model – Millennials Decision Model – that aligns with the HDM model, which emphasises the importance of initial attitudes and perceptions in shaping investor behaviour and investment goals. The interplay between elements from the theoretical framework (TPB and TAM) and HDM has brought in a holistic approach for the Millennials Decision Model. It highlights not only rational and emotional components, but also simplifies the decision-making process from millennial investors into a well-structured layout.
From the Millennials Decision Model, economic factors are the most important determinant of millennial investors' perceptions of cryptocurrency investment. In other words, economic factors are considered to be the most important element in the millennial decision model and are part of cryptocurrency's PU according to millennials. This finding correlates with previous studies from Alzahrani and Daim (2019), Lammer et al. (2019) and Kim et al. (2020), while it is in contrast to Linh Bui (2022), Tangwattanarat (2018) and Krafft et al. (2018) as social factors (friends and family) were found to be the most significant factor. The results from the qualitative phase showed that social factor is the most significant factor since the majority of respondents were influenced by friends when investing in cryptocurrency. This finding is different from the literature review in Chapter 2, which indicated that economic factors had the most impact on cryptocurrency investors. In contrast, the quantitative phase indicated that economic factors had the greatest influence on millennial investors' opinions followed by the social factor. This correlated with Alzahrani and Daim's (2019), Lammer et al.'s (2019) and Kim et al.'s (2020) discussions, since economic factors were found to be the most important element affecting cryptocurrency investors. The contradiction between qualitative and quantitative stages might relate to the duration of investors' experience in the cryptocurrency market. The majority of millennial investors in the qualitative stage had less than 2 years of experience with cryptocurrency. This suggests that they might be in a period of learning and transiting their perceptions through events with cryptocurrency. Likewise, they tended to rely on others' opinion in their decision-making process. The millennial investors from quantitative phase had more experience in investing with cryptocurrency market than the interviewees from the qualitative phase; they could be more confident and independent in terms of researching and behaving in this market.

In this thesis, results from the qualitative stage were used as guidance to strengthen the results of the quantitative stage. Moreover, findings from the quantitative stage were based on a larger sample pool compared to the qualitative phase. In the second stage of the study, the inferential

statistic from ANOVA test has significant value of 0.000, which is less than the acceptance value of 0.05 and Pearson coefficient is 0.940. These results mean there is a strong relationship between millennial investors' perceptions and the four main factors. Therefore, the findings from quantitative phase were thought to be more realistic for the drawing of conclusions.

# CHAPTER 8: CONCLUSION

The main aim of this research was to identify and analyse how millennial investors perceive cryptocurrency as an investment. This study has been done with the purpose of establishing an understanding of how four main dimensions (economic, technological, social and government) impact millennial investors' perception with the underpinning theories of TAM and TPB.

Before 2017, cryptocurrency was a relatively niche topic that was known mainly among the technology savvy and early adopters. However, the rapid rise in Bitcoin's value in 2017 brought cryptocurrency to the forefront of public attention, and many other cryptocurrencies, such as Ethereum, Litecoin, and Ripple, also gained in popularity. Moreover, cryptocurrency is known for its high volatility and potential for significant returns, which can be attractive to investors. Cryptocurrency operates independently of traditional banking systems, which can provide more control and security over one's assets. However, investing in cryptocurrency also comes with significant risks, such as the potential for significant losses due to high volatility and the lack of regulatory oversight in some jurisdictions. In terms of investors' perception, what drives their behaviours in cryptocurrency can play a significant role in how investors perceive and react to market movements.

This chapter of the research summarises the overall conclusion of the study as per the implementation of different theories and models identified in previous chapters (Chapter 2 and Chapter 3). The chapter begins with a summary of objectives' outcomes, then it discusses the significance and contribution of the study in the areas of theoretical framework, conceptual model, methodology and literature. This chapter also incorporates recommendations, research limitations and directions for future research.

## 8.1. SUMMARY FOR EACH OBJECTIVE

With the purpose of evaluating research questions and achieving the main aim, key objectives were proposed. The major objectives related to understanding millennial investors' decision making through HDM and their perceptions of cryptocurrency investment with TPB and TAM.

**Objective 1: To develop a conceptual model on the decision-making process that influences millennial investors in the cryptocurrency market**

A conceptual model was successfully developed according to HDM by Kocaoglu (2016) and findings from the qualitative phase of the study. By using HDM, the thesis can capture the steps involved in decision making in cryptocurrency. In other words, risks identification related to perceived ease of use, potential benefits beliefs, and experiences are linked to millennial investors' attitude. Furthermore, findings from qualitative phase helped identify key factors and variables. The four main areas the Millennials Decision Model focuses on are economic (price movement), technological (trust in the system), social (friends and family) and government (tax scheme). These variables were formed into new hypotheses that were tested with a regression model in the second stage of the study.

**Objective 2: To develop a regression model to test the correlation between millennial investors' perceptions and four main factors in cryptocurrency investment**

A regression model was successfully developed based on the Millennials Decision Model in which millennial investors' perceptions is the dependent variable and four independent variables were introduced (economic factor, technological factor, social factor and government factor). The instrument applied in this thesis is valid since Cronbach alpha's value is higher than 70%. The value of R squared is close to 1 (91%), which proved there is a strong impact of independent variables on dependent variable. Likewise, the significant value in the coefficient table is below 0.05 for 95% confidence intervals, which indicates a highly significant statistical correlation to millennial investors' perception. Last, but not least, the results of each ANOVA test were less than the acceptance value of 0.05, hence results for each hypothesis is significant. Therefore, there is a strong correlation between millennial investors' perceptions and four main factors in cryptocurrency investment.

**Objective 3: To determine which factor has the most significant influence on millennial investors' perceptions of cryptocurrency investment**

In objective 3, the integration of the two phases of the study showed that although millennial investors were influenced by others' success, the main reason that attracted them to cryptocurrency was monetary. In particular, the price movement of cryptocurrency market as an economic factor was proved to have the most significant influence on millennial investors' perception of cryptocurrency investment. On the other hand, security of the cryptocurrency system does not affect millennial investors. Their perceived risk level will change after a certain period of investing along with the level of perceived benefits of cryptocurrency investment. Millennial investors have the tendency to create a long-term plan with the gains from cryptocurrency, especially investors whose perceptions have significantly changed since their first investments.

## 8.2. CONTRIBUTION TO KNOWLEDGE

### 8.2.1 LITERATURE REVIEW

The literature review revealed gaps in the field of theories, methodology, stakeholders and the diversity of cryptocurrency investment.

The majority of studies about cryptocurrency tended to focus on users and technological aspects of cryptocurrency. These studies tended not to explore in depth different layers related to cryptocurrency investment. Generally, these papers either only focused on users' behaviour or on the perceived benefits for users (Al-Hussaini et al., 2019; Alshamsi and Andras, 2019). Existing papers that studied cryptocurrency investors did not specify their demographic factors (Xi et al., 2020; Rao et al., 2022; Chen and Farkas, 2019).

Secondly, research about cryptocurrency generally uses a single theory, which could limit the spectrum of various areas related to cryptocurrency investment. Studies from Gazali et al. (2018) and Echchabi (2021) claimed that their studies lacked empirical evidence and could not reveal factors behind SN and PBC. Additionally, Almajali et al. (2022) claimed that their study relied on TRA but still required TAM elements to study cryptocurrency investors. Each study could only concentrate on a single aspect of cryptocurrency and could not enhance deeper connections between multiple layers of investors' perceptions when choosing to invest in this market.

Thirdly, most papers studying investors' perception and behaviour in cryptocurrency context utilised quantitative methods. This might create a disadvantage in capturing thoughts, motivations and narratives of the cryptocurrency investors. As mentioned in Bui (2022), their survey failed to incorporate important consumer characteristics, which are important for analysis to provide coherent results. For that reason, this thesis has filled a gap in the literature by aiming attention at millennial investors, applying mixed methods and integrating different theories. Currently, only five papers adopted mixed methods to study attitude and behaviours in cryptocurrency (Mattke et al., 2020; Dehghani et al., 2022; Anuyahong and Ek-udom, 2023; Walther et al., 2019).

Last, this research has significance because it concentrates on a particular group – millennial investors – who are the majority participants and investors in cryptocurrency. Simultaneously, this thesis studied various areas that have a potential influence on millennial investors' perceptions of cryptocurrency investment; of these, government factors were one of the rarest aspects that had been studied, but only in the stock market.

### 8.2.2. THEORETICAL FRAMEWORK

In terms of theoretical contributions, this research integrates TPB and TAM to study perceptions and behaviours of millennial investors. Aligned with previous studies, my research confirmed that PU is the leading cause of millennial investors' perception of cryptocurrency investment. This influences millennial investors' attitude continuously before and during their investment. Simultaneously, millennial investors claimed that the PU was initially captured by herding behaviour or SN. For that reason, the integration of TPB and TAM offers new insights into which elements drive millennial investors' perceptions that lead to a planned behaviour or decision. The correlations between each factor and millennial investors' perceptions are demonstrated clearly. Correspondingly, the theoretical framework constructs a bridge to connect characteristics of millennial investors and the cryptocurrency market. It avoided unidirectional findings and clearly interpreted millennial investors' perceptions as changing processes.

### 8.2.3. METHODOLOGY

Studying how millennial investors perceive cryptocurrency as an investment is extremely challenging as a myriad of perceptions and interpretations must be taken into account. Hence, a mixed methods approach was employed to draw from their strengths and to minimise the weaknesses of one single approach. Additionally, only five papers used mixed methods to study consumers', businesses' and users' intentions and behaviours (Mattke and Maier, 2020; Dehghani et al., 2022; Mattke et al., 2020).

In this study, the application of mixed methods revealed how millennial investors value different sources of information and how their perceptions change due to different influences. Therefore, adopting mixed methods in this thesis has not only broadened access to respondents and formed a new model, but also increased the study's reliability and credibility through the diverse results.

Together with the research method, the author merged grounded theory and survey strategy for this research strategy for two major phases: qualitative and quantitative methods. This merger brought success for this study in terms of accuracy and time consumed. Despite the popularity of both strategies, this merger was rarely recorded in cryptocurrency-related research. This is mainly due to the dominant position of quantitative research in this field.

For the first phase of this mixed methods study, grounded theory was applied, and data collection and analysis occurred simultaneously. This method saved time while ensuring the success of the next phase's survey strategy development and minimising irrelevant bias. This study is exploratory, and the application of a survey strategy is advantageous when the research objective is to describe the prevalence of a phenomenon. With this contribution to knowledge, the integration of two strategies shortened time consumed and helps future researchers in controlling bias.

### 8.2.4. CONCEPTUAL MODEL

From this research, a new model named millennials decision model was developed to provide a concise view of millennial investors' decision making and avoid complexity of HDM. My model of decision making in cryptocurrency investment aligns with the HDM model, which posits that decision making involves a hierarchical process. The Millennials Decision Model provides critical insights into the dynamics of technology adoption and the factors that influence the development

of investment goals. In Chapter 7. Discussion, new hypotheses were established under the new model. They demonstrated solid connections between millennial investors' perceptions and economic, technological, social and government factors.

**New hypotheses**

***Hypothesis 1:*** There is a correlation between millennial investors' perceptions and economic factors (price movement)

***Hypothesis 2:*** There is a correlation between millennial investors' perceptions and technological factor (trust in the system)

***Hypothesis 3:*** There is a correlation between millennial investors' perceptions and social factors (friends and family)

***Hypothesis 4:*** There is a correlation between millennial investors' perceptions and government factors (tax scheme)

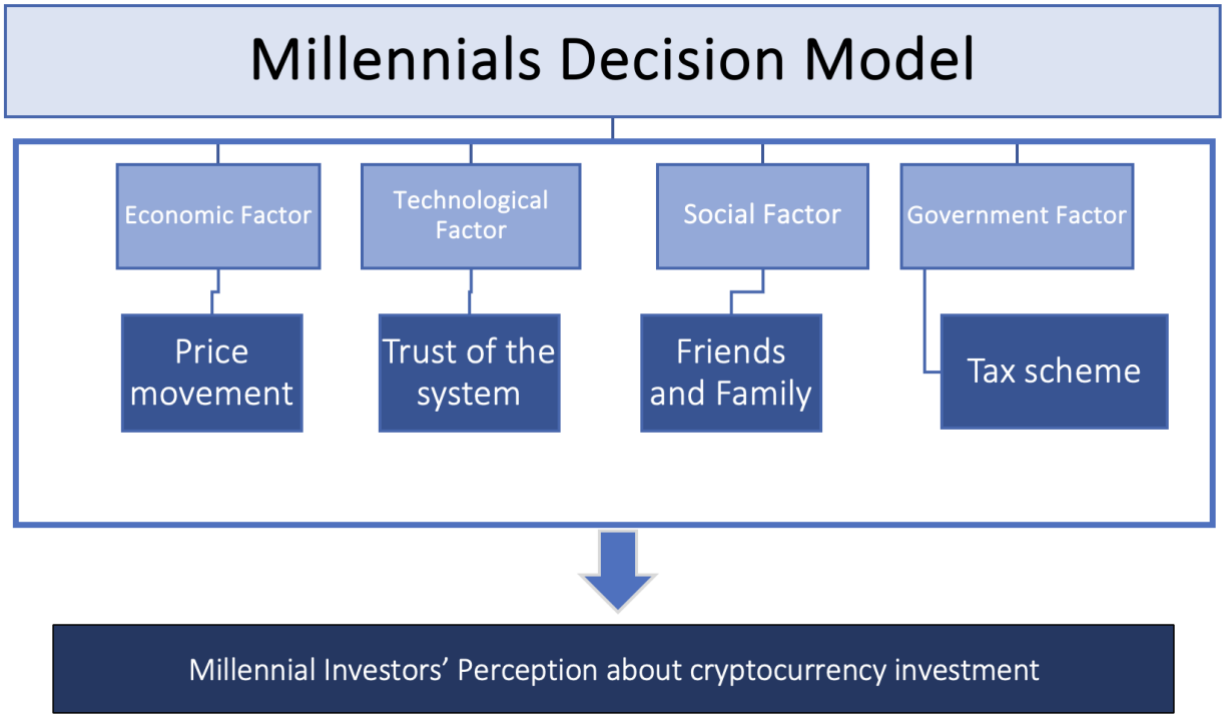


Figure 8.1 – Millennials Decision Model - Source: from the research

In HDM, various methods should be taken, such as pairwise comparisons, judgmental matrix, linking weights and gathering weights across multiple layers to reach the final weights of alternatives. The development of the new model simplifies these steps and increases the reliability of the research since pairwise comparisons often use linguistic evaluations (Cavallo and Ishizaka, 2023). Although pairwise comparisons have been applied for decision-making valuations, the conversion to numerical scale is not clear.

The Millennials Decision Model recognises that goals are founded on the changing perspectives and expectations of millennial investors as they gain experience with cryptocurrency investments. This model of objectives, factors and goals is a valuable framework for understanding the process of technology adoption, as it recognises the importance of initial curiosity and the role of PU and ease of use in shaping behaviour.

The Millennials Decision Model combined with TPB and TAM helps draw a clearer picture of millennials' behaviours. Once millennial investors have developed a positive attitude towards cryptocurrency investment, they are more likely to invest in the market, thus demonstrating their behaviours. Following this behaviour, millennial investors develop specific investment goals that reflect their aspirations for financial growth and returns. Moreover, the interplay between social, economic and technological factors shapes the attitude of millennial investors towards cryptocurrency investment. By understanding the complex interplay between social, economic and technological factors and their impact on investors' attitudes, researchers and financial professionals can develop more targeted and effective investment strategies that resonate with millennial investors.

Overall, this research contributes to a deeper understanding of the complex decision-making processes of millennial investors and highlights the importance of considering the changing perspectives and expectations of investors in developing effective investment strategies. By recognising the dynamic nature of investors' goals and expectations, financial professionals and policymakers can develop more responsive and effective investment frameworks that meet the evolving needs of millennial investors.

## 8.3. RECOMMENDATIONS

### 8.3.1. THEORETICAL RECOMMENDATIONS

In this research, the author has found that the Millennials Decision Model combined with TPB and TAM helps draw out a sharpened view of millennials' decision-making process. A positive attitude from millennial investors leads to actions towards cryptocurrency investment. Specifically, perceived risks and perceived benefits were the initial elements that millennials had considered before conducting any actions before their investment. Therefore, it is worthwhile to integrate at least two behavioural theories to study individuals' perception and behaviour towards cryptocurrency investment.

### 8.3.2. PRACTICAL RECOMMENDATIONS

In this thesis, millennial investors perceived monetary benefits that became more rational in the long run. Therefore, businesses in cryptocurrency can focus on promoting low fees or providing bonus coins for loyal investors. Likewise, Fintech companies can run marketing using influencers (i.e., Elon Musk) or major cryptocurrency platforms to attract investors, since millennial investors are motivated by SN. All respondents from qualitative phase claimed that they follow social media related to cryptocurrency. This engagement is also evidenced in Bohr and Bashir (2014), Craggs (2017) and Abraham (2020).

Furthermore, the author identified that millennial investors focus mostly on the market price and the circulation of coins. This is demonstrated in Figures 6.12 and 6.13 when the majority of millennial investors acted corresponding to the market price. Hence, it is helpful for businesses to incorporate analysing tools or deliver short descriptions about historical price for investors to support their decision-making process.

## 8.4. RESEARCH LIMITATIONS

In common with any research, the present study has its limitations and it is important to discuss them. These limitations stem primarily from the sample size and the availability of respondents for qualitative phase. This research was carried out during the COVID-19 pandemic, which restricted access to potential respondents. Many people may have been reluctant to participate in

interviews due to concerns about their health and safety. Remote interviews have become more common during the pandemic, but not everyone has access to the necessary technology or reliable internet connectivity to conduct interviews via video conferencing platforms. This made it challenging to schedule and carry out remote interviews.

In regard to sample size, a total of 10 interviewees and 121 participants were selected as the sample sizes for qualitative and quantitative methods, respectively. The sample size selected for this particular study was selected on the basis of time constraints. Hence, an increase in sample size would enable future researchers to focus on the greater number of responses collected, which might increase the overall generalisability of the findings over a larger population.

## 8.5. FUTURE RESEARCH

Based on my thesis, the effectiveness of combining millennials decision model with TPB and TAM has not been explored. In this regard, the researcher has identified some potential domains and provides suggestions for future researchers to extend the study based upon the main discoveries and findings of the study.

- The relationship between PU and perceived risks was not assessed in this paper. Further study about this connection would open doors for risk management, product development and innovation related to blockchain and cryptocurrency. Future research could identify features related to perceived risks that can eliminate barriers to cryptocurrency adoption.
- Market cycle and price movements of cryptocurrency are important among cryptocurrency investors. Therefore, an emphasis on the effect of cryptocurrency market characteristics on millennial investors would be a potential area of research. Besides, the cryptocurrency market failed to prove that it was not in line with macroeconomics during late 2021 and early 2022. Future research may consider exploring this aspect of how macroeconomics influences the cryptocurrency market.
- Moreover, regulations about cryptocurrency are being developed, it is worth researching how to capture different governments' influence on millennial investors in different countries.

# REFERENCES


Abbas, M. S. and Kocaoglu, D. F. (2016) Consistency thresholds for Hierarchical Decision Model. Portland International Conference on Management of Engineering and Technology: Technology Management for Social Innovation, 101

Abelson, R. P., Kinder, D. R., Peters, M. D. and Fiske, S. T. (1982) Affective and semantic components in political person perception. Journal of Personality and Social Psychology, 619–630, 42 (4)

Abraham, M. (2020) Studying the patterns and long-run dynamics in cryptocurrency prices

Abraham, R. (2020) The role of investor sentiment in the valuation of bitcoin and bitcoin derivatives. International Journal of Financial Markets and Derivatives, 7 (3)

Abramova, S. and Bohme, R. (2016) Perceived benefit and risk as multidimensional determinants of bitcoin use: a quantitative exploratory study. International Conference on Interaction Sciences

Adam, A. A. and Shauki, E. R. (2014) Socially responsible investment in Malaysia: behavioral framework in evaluating investors' decision-making process. Journal of Cleaner Production, 80

Ahmad, M. and Wu, Q. (2023) Heuristic-driven biases as mental shortcuts in investment management activities: a qualitative study. Qualitative Research in Financial Markets, ISSN 1755 – 4179

Ahmad, M. K. (2019) Multi-Disciplinary IMPACT FACTOR SJIF. International Journal of Research, 9 (1)

Ahmad, N. and Haron, S. (2002) Perception of Malaysian corporate customers towards Islamic banking products and services. International Journal of Islamic Finance Services, 3 (4)

Ahmad, T. (2019) Corporate social responsibility: A value-creation strategy to engage millennials. Strategic Direction, 5 – 8, 35 (7)

Ajmi, H. and Arfaoui, N. (2020) Effects of the political risk on bitcoin return and volatility: evidence from the 2016 US presidential election. Journal of Financial Economic Policy. Emerald Group Publishing Limited, 94 – 115, 13 (1)

Ajzen, I. (1985) From intentions to actions: A theory of planned behavior. J Kuhl, Beckmann (Eds.), Action-control: From cognition to behavior. Spinger, Heidelberg, 11 – 39

Ajzen, I. (1991) The theory of planned behavior. Organizational Behavior and Human Decision Processes, 179 – 211, 50 (2)

Ajzen, I. and Fishbein, M. (1977) Attitude-Behavior Relations: A Theoretical Analysis and Review of Empirical Research. Psychological Bulletin, 888 – 918, 84 (5)

Ajzen, I. and Madden, T.J. (1986) Prediction of Goal-Directed Behavior: Attitudes, Intentions and Perceived Behavioral Control. Journal of Experimental Social Psychology, 453-474, 22

Ajzen, I., Timko, C., & White, J. B. (1982) Self-monitoring and the attitude–behavior relation. Journal of Personality and Social Psychology, 426–435, 42 (3)

Akhtar, F. and Das, N. (2019) Predictors of investment intention in Indian stock markets. International Journal of Bank Marketing

Akhtar, F., Thyagaraj, K. S., Das, N. (2017) The impact of social influence on the relationship between personality traits and perceived investment performance of individual investors: Evidence from Indian stock market. International Journal of Managerial Finance, 130 – 148, 14 (1)

Al-Azzam, M. K. A. (2016) An integrated model for examining factors that influence customers' adoption of internet banking services provided by commercial banks in Jordan. Liverpool John Moores University

Al-hussaini, A. I. S, Ibrahim, A. A., Noordin, M. F. and Mohadis, H. M. (2019) Users perception of cryptocurrency system application from the Islamic views. International Journal on Islamic Applications in Computer Science and Technology, 13 – 25, 7 (1)

Al-Mansour, B. (2020) Cryptocurrency Market: Behavioral Finance Perspective. The Journal of Asian Finance, Economics and Business, 159-168, 7 (12)

Alalwan, A. A., Dwivedi, Y. K. and Rana, N. P. (2017) Factors influencing adoption of mobile banking by Jordanian bank customers: Extending UTAUT2 with trust. International Journal of Information Management, 99 – 110, 37 (3)

Albayati, H., Kim, S. K. and Rho, J. J. (2020) Accepting financial transactions using blockchain technology and cryptocurrency: a customer perspective approach. Technology in Society, 62

Alghamdi, S. and Beloff, N. (2015) Virtual currency concept its implementation, impacts and legislation. Conference: Science and Information Conference (SAI), 175 – 183, 1

Ali, A. (2011) Predicting individual investors' intention to invest: an experimental analysis of attitude as a mediator. World Academy of Science, Engineering and Technology, 50

Ali, M., Fjeldstad, O. H. and Sjursen, I. (2013) To pay or not to pay? Citizens' attitudes towards taxation in Kenya, Tanzania, Uganda and South Africa. Afrobarometer Working Papers 143

Alleyne, P. and Broome, T. (2011) Using the theory of planned behaviour and risk propensity to measure investment intentions among future investors. Journal of Eastern Caribbean Studies, 1 – 20, 36

Allport, G.W. (1935) Attitudes. In: Murchison, C., Edition, Handbook of Social Psychology, Clark University Press, Worcester, MA, 798-844

Almajali, D. A., Masa'Deh, R. and Dahalin, Z. M. d. (2022) Factors influencing the adoption of cryptocurrency in Jordan: An application of the extended TRA model. Cogent Social Sciences, 8 (1)

Almansour, B. Y. (2015) The impact of market sentiment index on stock returns: An empirical investigation on kuala Lumpur stock exchange. Journal of Arts, Science and Commerce, 1–28, 5

Almenberg, J. and Dreber, A. (2015) Gender, stock market participation and financial literacy. Economics Letters, 140 – 142, 137

Alomary, A. and Woodlard, J. (2015) How is technology accepted by users? A review of Technology Acceptance Models and theories. Conference: The IRES 17th International Conference

Alshami, A. and Andras, P. (2019) User perception of bitcoin usability and security across novice users. International Journal of Human-Computer Studies, 94 – 110, 126

Alzahrani, S. and Daim, T. U. (2019) Evaluation of the cryptocurrency adoption decision using Hierarchical Decision Modeling (HDM). Portland International Conference on Management of Engineering and Technology (PICMET)

Aminrad, Z., Zakariya, S. Z. B., Hadi, A. and Sakari, M. (2013) Relationship between awareness, knowledge and attitudes towards environmental education among secondary school students in Malaysia. World Applied Sciences Journal, 22

Ammer, M. A. and Aldhyani, T. H. (2022) An Investigation into the Determinants of Investment Awareness: Evidence from the Young Saudi Generation. Sustainability, 13454, 14 (20)

Anderson, K. (2013) Consumer fraud in the United States, 2011: The third FTC survey

Andrade, A. A., Lopes, V. V. and Novais, A. Q. (2012) Quantifying the impact on distrust of e-commerce trust factors: A non-parametric study. Conference: Internet Technology and Secured Transactions

Andrade, N., Chiluka, N., Gkorou, D. and Pouwelse, J. (2012) Personalizing eigentrust in the face of communities and centrality attack. Advanced Information Networking and Applications (AINA), IEEE 26th International Conference, 503–510

Ante, L., Fiedler, I., von Meduna, M. and Steinmetz, F. (2020) Individual cryptocurrency investors: evidence from a population survey

Anugraheni, S., Baridwan, Z. and Mardiati, E. (2018) Determinant of system use and its effect on the performance of government organizations. International Journal of Multicultural and Multireligious Understanding, 41, 5 (6)

Anuyahong, B. and Ek-udom, N. (2023) The impact of cryptocurrency on global trade and commerce. International Journal of Current Science Research and Review, 6 (4)

Aregbeyen, O. and Ogochukwu, S. (2011) Factors influencing investors decisions in shares of quoted companies in Nigeria. The Social Science, 205 – 212, 6 (3)

Arias-Oliva, M., Borondo, J. P. and Clavero, G. M. (2019) Variables influencing cryptocurrency use: a Technology Acceptance Model in Spain. Frontiers in Psychology, 475, 10

Aru, J., Rutiku, R., Wibral, M., Singer, W. and Melloni, L. (2016) Early effects of previous experience on conscious perception. Neuroscience of Consciousness, 1

Athey, S., Parashkevov, I., Sarukkai, V. and Xia, J. (2016) Bitcoin pricing, adoption, and usage: theory and evidence. Stanford University Graduate School of Business Research Paper No. 16 – 42

Awan, A. G. and Azhar, M. (2014) Consumer behaviour towards Islamic banking in Pakistan. European Journal of Accounting Auditing and Finance Research, 42 –65, 2 (9)

Ayedh, A., Echachabi, A., Battour, M. and Omar, M. (2020) Malaysian Muslim investors' behaviour towards the Blockchain-based Bitcoin cryptocurrency market. Journal of Islamic marketing

Azam, M. and Kumar, D. (2011) Factors influencing the individual investor and stock price variation: Evidence from Karachi stock exchange. Australian Journal of Basic and Applied Sciences, 3040 – 3043, 5 (12)

Babbie, E. R. (2010) The practice of social research. Cengage Learning

Badri, M., Alnuaimi, A., Mohaidat, J., Yang, G. and Rashedi, A. (2016) Perception of teachers' professional development needs, impacts and barriers: the Abu Dhabi case. SAGE Open, 6 (3)

Bagozzi, R. P. (1981) An examination of the validity of two models of attitude. Multivariate Behaviour Research, 16 (3)

Bagozzi, R., Davis, F. D. and Warshaw, P. (1992) Development and test of a theory of technological learning and usage. Human Relations, 45 (7)

Bai, X., Wang, A., Plummer, V. and Lam, L. (2019) Using the theory of planned behaviour to predict nurse's intention to undertake dual practice in China: A multi-centre survey. Journal of Clinical Nursing, 28 (3)

Bakar, M. S. A. and Bidin, R. (2014) Technology acceptance and purchase intention towards movie mobile advertising among youth in Malaysia. Procedia – Social and Behavioral Sciences, 558 – 567, 130

Baker, H. K., Filbeck, G. and Ricciardi, V. (2017) Financial behavior: players, services, products, and markets. Oxford University Press, New York

Balcilar, M., Bonato, M., Demirer, R. and Gupta, R. (2017) The effect of investor sentiment on gold market return dynamics: Evidence from a nonparametric causality-in-quantiles approach. Resources Policy, 77 – 84, 51

Banerjee, A. V. (1992) A simple model of herd behavior. The Quarterly Journal of Economics, Oxford University Press, 797 – 817, 107 (3)

Barber, B. M. and Odean, T. (2008) All that glitters: The effects of attention and news on buying behavior of individual and institutional investors. Review of Financial Studies, 785 – 818, 21 (2)

Barber, B. M. and Odean, T. (2013) Chapter 22 – The behavior of individual investors. Handbook of the Economics of Finance, 1533 – 1570, 2

Barker, V. (2012) A generational comparison of Social networking site use: The influence of age and social identity. The International Journal of Aging and Human Development, 163-187, 74(2)

Barone, R. and Masciandaro, D. (2019) Cryptocurrency or usury? Crime and alternative money laundering techniques. European Journal of Law and Economics, 233-254, 47 (2).

Barrett, D. and Twycross, A. (2018) Data collection in qualitative research. 63 – 64, 21 (3)

Barua, A. (2013) Methods for Decision-Making in Survey Questionnaires Based on Likert Scale. Journal of Asian Scientific Research, 35-38, 3

Bashir, M., Strickland, B. and Bohr, J. (2016) What motivates people to use bitcoin? Illinois Experts

Bateman, I., Dent, S., Peters, E., Slovic, P. and Starmer, C. (2007) The affect heuristic and the attractiveness of simple gambles. Journal of Behavioral Decision Making, 365 – 380, 20 (4)

Bauer, D. L., Collins, D. T. and Richardson, K. (2017) Attitudes about financial wealth: Generational comparisons of Gen-Xers vs Millennials. Journal of Business & Economic Policy, 4 (2)

Baum, F. (2018) People's health and the social determinants of health. Health Promotion Journal of Australia, 8-9, 29 (1)

Benson, V., Saridakis, G., Tennakoon, H. and Ezingeard, J. N. (2015) The role of security notices and online consumer behaviour: an empirical study of social networking users. International Journal of Human Computer Studies, 36 – 44, 80

Bernard, H.R. (2002) Research Methods in Anthropology: Qualitative and quantitative methods. 3rd Edition, AltaMira Press, Walnut Creek, California

Bhabha, J. I., Khan, S., Qureshi, Q. A., Neem, A. and Khan, I. (2014) Impact of Financial literacy on saving-investment behavior of working women in the developing countries. Research Journal of Finance and Accounting, 5 (13)

Bhilawadikar, V. and Garg, E. (2020) Investment attitude of millennials towards cryptocurrencies. Social Business, 10 (4)

Bhuyan, R., Bhattacharjee, J., Singh, R. and Bhattacharjee, N. (2021) Do awareness, risk perception, and past experience influence equity investments? A case study on India. Global Journal of Accounting and Finance, 5

Biddle, C. and Schafft, K. A. (2015) Axiology and Anomaly in the Practice of Mixed Methods Work: Pragmatism, Valuation, and the Transformative Paradigm. Journal of Mixed Methods Research, 320 – 334, 9 (4)

Biesta, G. (2010) Pragmatism and the philosophical foundations of mixed methods research. In A. Tashakkori & C. Teddlie, Sage handbook of mixed methods in social and behavioral research, 2nd Edition, Thousand Oaks: SAGE Publications

Blazquez, M., Alexander, B. and Fung, K. (2020) Exploring Millennial's perceptions towards luxury fashion wearable technology. Journal of Fashion Marketing and Management, 343-359, 24 (3)

Bleher, J. and Dimpfl, T. (2019) Today I got a million, tomorrow, I don't know: On the predictability of cryptocurrencies by means of Google search volume. International Review of Financial Analysis, 147 – 159, 63

Bley, J. and Kuehn, K. (2004) Conventional versus Islamic finance: student knowledge and perception in the United Arab Emirates. International Journal of Islamic Financial Services, 1 –13

Bohr, J. and Bashir, M. (2014) Who uses Bitcoin? An exploration of the Bitcoin community. Twelfth Annual International Conference on Privacy, Security and Trust, 94 –101

Bondarenko, O., Kichuk, O. and Antonov, A. (2019) The possibilities of using investment tools based on cryptocurrency in the development of the national economy. Baltic Journal of Economic Studies, 5 (2)

Borah, N., Barman, H. and Basneth, D. (2023) Indian millennials attitude towards cryptocurrencies. Journal of Management in Practice, 8 (1)

Borri, N. and Shakhnov, K. (2020) Regulation spillovers across cryptocurrency markets. Finance Research Letters, 36

Bosnjak, M., Obermeir, D. and Tuten, T. (2006) Predicting and explaining the propensity to bid in online auctions: A comparison of two action-theoretical models. Journal of Consumer Behaviour, 102 – 116, 5

Bouoiyour, J., Selmi, R., Tiwari, A. K. and Olayeni, O. R. (2016) What drives Bitcoin price? Economic Bulletins, AccessEcon, 843-850, 36(2)

Bouri, E., Gupta, R. and Roubaud, D. (2018) Herding behaviour in cryptocurrencies. Finance Research Letters. Available at: https://doi.org/https://doi.org/10.1016/j.frl.2018.07.008

Bourveau, T., George, E. T. D., Ellahie, A. and Macciocchi, D. (2018) The role of disclosure and information intermediaries in an unregulated capital market: evidence from Initial Coin Offerings. Journal of Accounting Research, 129 – 167, 60 (1)

Boxer, M. and Thompson, N. (2020) Herd Behaviour in Cryptocurrency Markets. ACIS 2020 Proceedings, 42

Boyer, K. K. and Hult, G. T. M. (2005) Customer behavior in an Online ordering application: A decision scoring model. Decision Sciences, 569 – 598, 36 (4)

Bradbury, M., Hens, T. and Zeisberger, S. (2015) Improving investment decisions with simulated experience. Review of Finance, 1019 – 1052, 19

Brakus, J., Schmitt, B., and Zarantonello, L.(2009) Brand experience: What is it? How is it measured? Does it affect loyalty? Journal of Marketing, 73 (3)

Brannen, J. (2017) Mixing Methods: Qualitative and Quantitative Research. Abingdon-on-Thames: Routledge

Braun, V. & Clarke, V. (2006) Using thematic analysis in psychology. Qualitative Research in Psychology, 77-101, 3 (2)

Braun, V., Clarke, V. (2012) Thematic analysis. In: Cooper, H., Camic, P.M., Long, D.L., Panter, A.T., Rindskopf, D., Sher, K.J. (eds.) APA Handbook of Research Methods in Psychology, Research Designs. American Psychological Association, Washington

Braun, V., Clarke, V. (2013) Successful Qualitative Research: A Practical Guide for Beginners. Sage Publications, Thousand Oaks

Braun, V., Clarke, V. (2014) Thematic analysis. In: Teo, T. (ed.) Encyclopedia of Critical Psychology. Springer, New York

Braun, V., Clarke, V. (2020) One size fits all? What counts as quality practice in (reflexive) thematic analysis? Qual. Res. Psychol.

Breckler, S. J. and Wiggins, E. C. (1989) Affect versus evaluation in the structure of attitudes. Journal of Experimental Social Psychology, 253 – 271, 25 (3)

Brierley, J. A. (2017) The role of a pragmatist paradigm when adopting mixed methods in behavioural accounting research. International Journal of Behavioural Accounting and Finance, 140 – 154, 6 (2)

Brock, T. C. and Green, M. C. (2005) Persuasion, Psychological Insights and Perspectives. 2nd Edition, Sage Publications, Thousand Oaks, Calif

Brown, J. E. (2018) Millennials and Retirement: Already falling short. National Institute on Retirement Security

Bryman, A. (2012). Social research methods. 4th Edition, Oxford University press

Budree, A. and Nyathi, T. (2023) Can Cryptocurrency be a payment method in a developing economy? Journal of Electronic Commerce in Organizations, 1-21, 21 (1)

Bui, L. (2022) Investor behavior in the cryptocurrency market. Department of Business Administration, International Business Program

Byrne, D. (2022) A worked example of Braun and Clarke's approach to reflexive thematic analysis. Qual Quant, 1391 – 1412, 56

Cagli, E. C. (2019) Explosive behavior in the prices of Bitcoin and altcoins. Finance Research Letters, 398 – 403, 29

Calvo-Porral, C. and Pesqueira-Sanchez, R. (2019) Generational differences in technology behaviour: comparing millennials and Generation X. Kybernetes, 2755 – 2772, 49(11)

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D. and Walker, K. (2020) Purposive sampling: complex or simple? Research case examples. Journal of Research in Nursing, 652 – 661, 25 (8)

Carmona, T. (2022) Debunking the narratives about cryptocurrency and financial inclusion. Brookings Metro. Available at: https://www.brookings.edu/articles/debunking-the-narratives-about-cryptocurrency-and-financial-inclusion/ (Accessed: 30th January 2023)

Cavallo, B. and Ishizaka, A. (2023) Evaluating scales for pairwise comparisons. Spinger, 951 – 965, 325 (2)

Chaiken, S. and Stangor, C. (1987) Attitudes and attitude change. Annual review of psychology, 575–630, 38

Chaitanya, D. B. and Nordin, N. (2021) The relationship between psychological factors, risk perception and social media on investment decision making. International Journal of Advanced Research in Economics and Finance, 55 – 72, 3 (4)

Chang, M. K. (1998) Predicting unethical behavior: a comparison of the theory of reasoned action and the theory of planned behavior. Journal Business Ethics, 1825 – 1833, 17 (16)

Chang, Y. L., Wong, S. F., Lee, H. and Jeong, S. (2016) What motivates chinese consumers to adopt FinTech services. Proceedings of the 18th Annual International Conference on Electronic Commerce e-Commerce in Smart connected World ICEC '16, 1-3

Charles, A., and Kasilingam, R. (2013) Does the investor's age influence their investment behaviour? Paradigm, 11–24, 17

Chatterjee, R., Chapman, T., Brannan, M. G. and Varney, J. (2017) GPs' knowledge, use, and confidence in national physical activity and health guidelines and tools: a questionnaire-based survey of general practice in England. Br J Gen Pract, 67 (663)

Chen, C. C., Wu, J. and Crandall, R. E. (2007) Obstacles to the adoption of radio frequency identification technology in the emergency rooms of hospitals. International Journal of Electronic Healthcare, 193 – 207, 3

Chen, D., Wan, Q. and Shi, W. (2016) Online Peer-to-peer lending decision making: model development and testing. Social behavior and personality. An international journal, 117 – 130, 44 (1)

Chen, G., Kim, K. A., Nofsinger, J. R. and Rui, O. M. (2007) Trading performance, disposition effect, overconfidence, representativeness bias, and experience of emerging market investors. Journal of Behavioral Decision Making, 425 – 451, 20 (4)

Chen, H. and Kocaoglu, D. F. (2008) A sensitivity analysis algorithm for hierarchical decision models. European Journal of Operational Research, 266 – 288, 185 (1)

Chen, L. C. and Farkas, D. (2019) Individual risk perception and choice using cryptocurrency for transactions. ICIS 2019 Proceedings, 10

Cheng, E. W. L. (2018) Choosing between the theory of planned behavior (TPB) and the technology acceptance model (TAM). Educational Technology Research and Development, 67 (2)

Cheon, J., Lee, S., Crooks, S. M. and Song, J. (2012) An investigation of mobile learning readiness in higher education based on the theory of planned behavior. Computers & Education, 1054 – 1064, 59 (3)

Cho, E., Fiore, A. M. and Russell, D. W. (2015) Validation of a fashion brand image scale capturing cognitive, sensory, and affective dimensions: Testing its role in an extended brand equity model. Psychology & Marketing, 28 –48, 32 (1)

Chod, J. and Lyandres, E. (2019) A Theory of ICOs: Diversification, Agency, and Information Asymmetry. Management Science

Chung J. M., Choe H. and Kho B.-C. (2009) The impact of day-trading on volatility and liquidity. Asia Pacific Journal of Financial Studies, 237–275, 38

Ciaian, P., Rajcaniova, M. and Kancs, D. A. (2018) Virtual relationships: Short- and long-run evidence from Bitcoin and altcoin markets. Journal of International Financial Markets, Institutions and Money, 173 – 195, 52

Cipriani, M. and Guarino, A. (2014) Estimating a structural model of herd behavior in financial markets. The American Economic Review, 224 – 251, 104 (1)

Clark-Murphy, M. and Soutar, G. N. (2004) What individual investor's value: Some Australian evidence. Journal of Economic Psychology, 539 – 555, 25

Cobb, S. (1976) Social support as a moderator of life stress. Psychosomatic Medicine, 300-314, 38

Coinbase (no date) What is market cap? Coinbase, Crypto Basics. Available at: https://www.coinbase.com/en-gb/learn/crypto-basics/what-is-market-cap#:~:text=Mid%2Dcap%20cryptocurrencies%20have%20market,swings%20based%20on%20market%20sentiment (Accessed: 11th April 2024)

CoinMarketCap (2017) Historial Snapshot – 17 December 2017. Available at: https://coinmarketcap.com/historical/20171217/ (Accessed: 11th April 2023)

Coinmarketcap (no date) Today's Cryptocurrency Prices by Market Cap. Available at: https://coinmarketcap.com/ (Accessed: 11th April 2024)

Conlon, T. and McGee, R. (2020) Safe haven or risky hazard? Bitcoin during the Covid-19 bear market. Finance Research Letters, 101607, 35

Connelly, L.M. (2008) Pilot Studies. MEDSURG Nursing, 411-412, 17

Conner, M., Wilding, S. and Norman, P. (2022) Testing predictors of attitude strength as determinants of attitude stability and attitude-behaviour relationships: a multi-behaviour study. European Journal of Social Psychology, 656 – 668, 52 (4)

Cooper, C.R. and Schindler, P.S. (2008) Business Research Methods. 10th Edition, McGraw-Hill, Boston

Corbet, S., Meegan, A. and Larkin, C. (2018) Exploring the dynamic relationships between cryptocurrencies and other. Economics Letters, 28-34, 165

Coşkun, Y. and Bekçioglu, S. (2018) Financial decisions, tax effect and investment performance. Association of Scientists and Intellectuals of Kosovo, 14 – 35, 1

Costa, F. D. and Aziz, N. (2019) The influence of philanthropic marketing and social media marketing on millennials' purchase intention of shariah-compliant stocks, 1 – 11, 2

Costa, P. and McCrae, R. (2012) The Five-Factor model and the NEO inventories in James N. Butcher (ed.). Oxford Handbook of Personality Assessment, Oxford Library of Psychology, 299-322, 16

Courtney, C., Dutta, S. and Li, Y. (2016) Resolving information asymmetry: signaling, endorsement, and crowdfunding success. SAGE Journals, 41 (2)

Coutu, O. (2014) Privacy in bitcoin through decentralized mixers

Craggs, B. (2017) Information bias and trust in bitcoin speculation. Department of Computer Science

Creswell, J. W. (2014) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. 4th Edition, SAGE Publications

Creswell, J. W. and Clark, V. L. P. (2011) Designing and Conducting Mixed Methods Research. 2nd Edition, Thousand Oaks: SAGE Publications

Creswell, J. W. and Clark, V. L. P. (2020) Designing and Conducting Mixed Methods Research. 3rd Edition, Thousand Oaks: SAGE Publications

Creswell, J. W., & Plano Clark, V. L. (2018). Designing and Conducting Mixed Methods Research. 3rd Edition, SAGE Publications

Creswell, J. W., Reilly, T. M. and Harrison, R. L. (2020) Methodological rigor in mixed methods: An application in management studies. Journal of Mixed Methods Research, 14 (1)

Creswell, J.W. (2013) Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th Edition, SAGE Publications

Cuandra, F. (2020) The analysis of investment interests of millennial generation in Batam City with planned behavior theory. Universitas Internasional Batam, 4 (3)

Cucinelli, D., Gandolfi, G., Soana, M. G. (2016) Customer and advisor financial decisions: the Theory of Planned Behavior perspective. International Journal of Business and Social Science, 7 (12)

Daqar, M. A. M. A., Arqawi, S. and Karsh, S. A. (2020) Fintech in the eyes of Millennials and Generation Z (the financial behavior and Fintech perception). Banks and Banks Systems, 20-28, 15 (3)

Daquar, M. A., Arquawi, S. and Karsh, S. A. (2020) Fintech in the eyes of Millennials and Generation Z (the financial behavior and Fintech perceptions). Banks and Bank systems, 20 - 28, 15 (3)

Dash, M. K. (2010) Factors influencing investment decision of generations in India: An econometric study. International Journal of Business Management Economic Research, 15 – 26, 1 (1)

Dash, M., Mohanty, A. K., Pattnaik, S. and Mohapatra, R. C. (2011) Using the TAM model to explain how attitudes determine adoption of internet banking, 50 – 59

Davis, F. D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 319-340, 13(3)

Davis, F. D. (1993) User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. International Journal of Man-Machine Studies, 475 – 487, 38 (3)

Davis, F. D. and Davis, F. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 319 – 339, 13 (3)

de Best, R. (2023) Number of Bitcoin block explorer Blockchain.com wallet users worldwide from November 2011 to November 17, 2022. Statista. Available at: https://www.statista.com/statistics/647374/worldwide-blockchain-wallet-users/ (Accessed: 30th October 2023)

de Vaus, D. (2013) Surveys in Social Research. 6th Edition, Routledge, London

de Vaus, D. (2014) Surveys in Social research. 6th Edition, Taylor & Francis

Debevec, K., Schewe, C. D., Madden, T. J. and Diamond, W. D. (2013) Are today's Millennials splintering into a new generational cohort? Maybe!. Journal of Consumer Behaviour, 20 – 31, 12 (1)

Dehghani, M. A., Karavidas, D., Rese, A. and Acikgoz, F. (2023) Bridging the adoption gap for cryptocurrencies: understanding the affordances that impact approach-avoidance behavior for potential users and continuation usage for actual users. Information Technology & People

Demirel, E. and Gunay, S. G. (2011) Interaction between demographic and financial behavior factors in terms of investment decision making. International Research Journal of Finance and Economics, 147-156, 66

Dewey, J. (2019) Global legal insights – Blockchain and Cryptocurrency regulation. Global Legal Group Ltd. Available at: https://www.acc.com/sites/default/files/resources/vl/membersonly/Article/1489775_1.pdf (Accessed: 29th May 2021)

Dewi, V. I., Febrian, E., Effendi, N., Anwar, M., & Nidar, S. R. (2020) Financial literacy and its variables: The evidence from Indonesia. Economics and Sociology, 133-154, 13 (3)

Diatmika, I. W. B, Irianto, G. and Baridwan, Z. (2016) Determinants of behavior intention of accounting information systems based information technology acceptance. Imperial Journal of Interdisciplinary Research, 2

Dillon, T. and Reif, H.L. (2004) Factors Influencing Consumers Factors Influencing Consumers: E-Commerce Commodity Purchases Commerce Commodity Purchases. Information Technology, Learning, and Performance Journal, 230-233, 22

Doblas, M. P. (2019) Awareness and attitude towards cryptocurrencies in relation to adoption among college students in a private tertiary institution in Cagayan De Oro City, Philippines. International Journal of Advanced Research and Publications, 15 –19, 3 (4)

Dolbec, P. Y. and Chebat, J. C. (2013) The impact of a flagship vs. a brand store on brand attitude, brand attachment and brand equity. Journal of Retailing, Elsevier, 460 – 466, 89 (4)

Dorn Jones, A., Dorn, D. and Sengmueller, P. (2015) Trading as Gambling. Management Science, 2376–2393, 61

Dudovskiy, J. (2016) The ultimate guide to writing a dissertation in business studies: A step-by-step assistance. Journal of Mixed Methods Research, 6 – 16, 4 (1)

Dyhrberg, A. (2016) Bitcoin, gold and the dollar – A GARCH volatility analysis. Finance Research Letters, 85-92, 16

Echchabi, A., Aziz, H. A. and Tanas, I. N. (2021) Determinants of investment in cryptocurrencies: The case of Morocco. Review of Accounting, Finance and Governance, RAFGO, 1 – 6, 1 (1)

Echchabi, A., Omar, M. and Ayedh, A. (2021) Factors influencing Bitcoin investment intention: the case of Oman. International Journal of Internet Technology and Secured Transactions, 11 (1)

Edwards, F., Hanley, K. and Litan, R. (2019) Crypto Assets require better regulation: statement of the financial economists roundtable on crypto assets. Financial Analysts Journal, 14-19, 75 (2)

Elliott, D., de Lima, L. and Singel, R. (2018) Cryptocurrency and public policy key questions and answers. Oliver Wyman, Marsh and McLennan Companies. Available at: https://www.oliverwyman.com/content/dam/oliver-wyman/v2/publications/2018/February/Cryptocurrencies_and_Public_Policy_Oliver_Wyman.pdf

Faqih, K. 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 of Retailing and Consumer Services, 140 – 164, 30

Fares, A. R. and Khamis, F. (2011) Individual Investors' Stock Trading Behavior at Amman Stock Exchange. International Journal of Economics and Finance, 3 (6)

Farjoun, M., Ansell, C. and Boin, A. (2015) PERSPECTIVE – Pragmatism in Organization Studies: Meeting the challenges of a dynamic and complex world. Organization Science, INFORMS, 1787 – 1804, 26 (6)

Fazio, R. H. and Olson, M. A. (2003) Implicit measures in social cognition research: their meaning and use. Annual review of psychology, 297 – 327, 54

Fazio, R. H., Powell, M. C. and Williams, C. J. (1989) The role of attitude accessibility in the attitude-to-behavior process. Journal of Consumer Research, 280 – 288, 16 (3)

Featherman, M. and Pavlou, P. (2003) Predicting E-services adoption: a perceived risk facets perspective. International Journal of Human – Computer Studies, 451 – 474, 59 (4)

Feilzer, M. Y. (2010) Doing mixed methods research pragmatically: Implications for the rediscovery of pragmatism as a research paradigm. Journal of Mixed Methods Research, 6 – 16, 4 (1)

Feinstein, B. D. and Werbach, K. (2021) The Impact of Cryptocurrency Regulation on Trading Markets. Journal of Financial Regulation, 48-99, 7(1)

Financial Stability Board (2019) FinTech and market structure in financial services: Market developments and potential financial stability implication. Available at: https://www.fsb.org/wp-content/uploads/P140219.pdf (Accessed: 29th August 2021)

Finke, M. and Huston, S. (2003) Time preference and intertemporal decision making: Evidence from the health and retirement study. Personal Financial Planning

Fishbein, M. and Ajzen, I. (1975) Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research. Reading, MA: Addison-Wesley

Fleetwood, S. (1995) Ontology in organization and management studies: A critical realist perspective. SAGE Journals, 12 (2)

Flick, U. (2015) Introducing research methodology: A beginner's guide to doing a research project. SAGE Publications

Folkinshteyn, D. and Lennon, M. M. (2017) Braving Bitcoin: A Technology Acceptance Model (TAM) analysis. Journal of Information Technology Case and Application Research, 220 – 249, 184 (4)

Fontana, G. (2023) Charted: Crypto popularity across the EU. World Economic Forum, Financial and monetary systems. Available at:

https://www.weforum.org/agenda/2023/03/charted-crypto-popularity-across-the-eu/ (Accessed: 12th April 2024)

Foot, D.K. and Stoffman, D. (1998) Boom, Bust and Echo 2000: Profiting from the Demographic Shift in the New Millennium. Macfarlane, Walter & Ross, Toronto, ON, Canada

French, D. P., Sutton, S., Hennings, S. J., Mitchell, J., Wareham, N. J., Griffin, S., Hardeman, W. and Kinmonth, A. L. (2006) The importance of affective beliefs and attitudes in the Theory of Planned Behavior: Predicting Intention to Increase Physical Activity. Journal of Applied Social Psychology, 1824 – 1848, 35 (9)

Freshfields Bruckhaus Deringer (2023) Cryptocurrency assets and tax – a snapshot. Available at: https://www.freshfields.com/en-gb/our-thinking/knowledge/briefing/2023/01/cryptoassets---a-snapshot/ (Accessed: 20th August 2023)

Frey, B. B. (2018) The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation. SAGE Publications

Gai, P. and Vause, N. (2005) Measuring investors' risk appetite. Bank of England Working Paper Series No. 283

Galen, D., Brand, N., Boucherle, L., Davis, R., Do, N., Eel-Baz, B., Kimura, I., Wharton, K. and Lee, J. (2018) Blockchain for social impact: Moving beyond the hype. Stanford Graduate School of Business, Center for Social Innovation

Gao, X., Clark, G. D. and Lindqvist, J. (2016) Of two minds, multiple addresses, and one ledger: Characterizing opinions, knowledge, and perceptions of bitcoin across users and non-users. Conference: the 2016 CHI Conference

Garber, J. (2017) Bitcoin spikes after Japan says it's a legal payment method. Business Insider. Available at: https://www.businessinsider.com/bitcoin-price-spikes-as-japan-recognizes-it-as-a-legal-payment-method-2017-4?r=US&IR=T (Accessed: 10th March 2023)

Garcia, D., Tessone, C. J., Mavrodiev, P. and Perony, N. (2014) The digital traces of bubbles: feedback cycles between socio-economic signals in the Bitcoin economy. Journal of the Royal Society Interface

Gazali, H. M., Ismail, C. M. H. C. and Amboala, T. (2018) Exploring the intention to invest in cryptocurrency: the case of bitcoin. Conference: 2018 International Conference on Information and Communication Technology for the Muslin World (ICT4M)

Geetha, N. and Ramesh, M. (2012) A study on relevance of demographic factors in investment decisions. Perspectives of Innovations, Economics and Business, 10 (1)

Gentile, D. A., Swing, E. L., Lim, C. G. and Khoo, A. (2012) Video game playing, attention problems, and impulsiveness: Evidence of Bidirectional Causality. Psychology of Popular Media Culture, 62-70, 1(1)

Gentles, S. J., Charles, C., Ploeg, J. and McKibbon, K. A. (2015) Sampling in Qualitative Research: Insights from an overview of the methods literature. The Qualitative Report, 1772 – 1789, 20 (11)

Ghauri, P. N., & Grønhaug, K. (2005). Research Methods in Business Studies: A Practical Guide. Pearson, London

Gill, J. and Johnson, P. (2010) Research methods for managers. 4th Edition, SAGE Publications

Gkritsi, E. (2021) Chinese investors flocked to cryptocurrencies amid techwar. Technode. Available at: https://technode.com/2021/01/19/chinese-investors-flocked-to-cryptocurrencies-amid-techwar/ (Accessed: 25th September 2022)

Glaser, B. G., & Strauss, A. L. (1967) The Discovery of Grounded Theory: Strategies for Qualitative Research. Aldine. Doi: https://doi.org/10.1097/00006199-196807000-00014

Glaser, F., Zimmerman, K., Haferkorn, M., Weber, M. C. and Siering, M. (2014) Bitcoin – Asset or Currency? Revealing users' hidden intentions. 22nd European Conference on Information Systems, Tel Aviv

Glasman, L. and Albarracín, D. (2006) Forming attitudes that predict future behavior: A meta-analysis of the attitude-behavior relation. Psychological bullentin, 778 – 822, 132

Godelnik, R. (2017) Millennials and the sharing economy: Lessons from a 'buy nothing new, share everything month' project. Environmental Innovation and Societal Transition, 40 – 52, 23.

Goldkulh, G. (2012) Pragmatism vs interpretivism in qualitative information systems research. European Journal of Information Systems, 21 (2)

Goodell, J. W. and Goutte, S. (2021) Co-movement of Covid-19 and bitcoin: Evidence from wavelet coherence analysis, 38

Gopi, M. and Ramayah, T. (2007) Applicability of theory of planned behavior in predicting intention to trade online: Some evidence from a developing country. International Journal of Emerging Markets, 348 – 360, 2 (4)

Grable, J. and Lytton, R. H. (2004) Projection bias and financial risk tolerance. Journal of Behavior Finance, 142 – 147, 5 (3)

Graham, S. (2023) European millennials' appetite for riskier investments in the current volatile market ranks higher than older age groups. EY Global Wealth Research Report. Available at: https://www.ey.com/en_gl/newsroom/2023/04/european-millennials-appetite-for-riskier-investments-in-the-current-volatile-market-ranks-higher-than-older-age-groups-ey-global-wealth-research-report (Accessed: 12th April 2024)

Gray, D. E. (2018) Doing research in the real world. 4th Edition, SAGE Publications

Grinblatt, M., Ikaheimo, S., Keloharju, M. and Knupfer, S. (2016) IQ and Mutual fund choice. Management Science, 924 – 944, 62 (4)

Guba, E. G. and Lincoln, Y. S. (1985) Naturalistic Inquiry. SAGE Publications

Guba, E. G. and Lincoln, Y. S. (1994) Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln. Handbook of qualitative research, SAGE Publications, 105–117

Guetterman, T. C. and Fetters, M. D. (2018) Two methodological approaches to the integration of mixed methods and case study designs: a systematic review. American Behavioral Scientist, SAGE Journals, 62 (7)

Guetterman, T. C., Babchuk, W. A., Smith, M. C. H. and Stevens, J. (2017) Contemporary approaches to mixed methods – grounded theory research: A field-based analysis. Journal of Mixed Methods Research, SAGE Journals, 13 (2)

Gunnarsson, J. and Wahlund, R. (1997) Household financial strategies in Sweden: An exploratory study. Journal of Economic Psychology, 201 – 233, 18 (2 – 3)

Gurau, C. (2012) A life-stage analysis of consumer loyalty profile: comparing Generation X and millennial consumers. Journal of Consumer Marketing, 103 – 113, 29 (2)

Gurdgiev, C. and O'Loughlin, D. (2020) Herding and anchoring in cryptocurrency markets: Investor reaction to fear and uncertainty. Journal of Behavioral and Experimental Finance, 25

Hacioglu, U. (2019) Blockchain Economics and Financial Market Innovation. Contributions to Economics

Hajli, N., Sims, J, Zadeh, A. H. and Richard, M. O. (2017) A social commerce investigation of the role of trust in a social networking site on purchase intentions. Journal of Business Research, 133 –141, 71

Halej, J. (2017) Ethics in primary research (focus groups, interviews and surveys). Equality Challenge Unit

Hammond, S. and Ehret, T. (2022) Cryptocurrency regulations by country. Thompson Reuters. Available at: https://www.thomsonreuters.com/en-us/posts/wp-content/uploads/sites/20/2022/04/Cryptos-Report-Compendium-2022.pdf (Accessed: 30th January 2023)

Hansen, J. M., Saridakis, G. and Benson, V. (2018) Risk, trust, and the interaction of perceived ease of use and behavioral control in predicting consumers' use of social media for transactions. Computers in Human Behavior, 197 – 206, 80

Hanzaee, K. H. and Alinejad, S. (2012) An investigation about customers perceptions of security and trust in e-payment systems among Iranian online consumers. Journal of Basic and Applied Scientic Research, 1575 – 1581, 2 (2)

Harchaoui, J. (2018) Libya's Monetary Crisis. Lawfare Blog. Available at: https://www.lawfaremedia.org/article/libyas-monetary-crisis (Accessed: 20th October 2020)

Hartley, J. (2014) Some thoughts on Likert-type scales. International Journal of Clinical and Health Psychology, 83 – 86, 14 (1)

Hasib, A. (2020) Personality traits and perceived investment performance: mediating role of social influence. Journal of Finance and Economics research, 18 – 29, 5 (1)

Hasso, T., Pelster, M. and Breitmayer, B. (2019) Who trades cryptocurrencies, how do they trade it, and how do they perform? Evidence from brokerage accounts. Journal of Behavioral and Experimental Finance, 64 – 74, 23

Hayes, A. (2015) A cost of production model for Bitcoin. SSRN Electronic Journal. Available at: 10.2139/ssrn.2580904

Hayes, N. (1998) Doing qualitative analysis in psychology. Hove: Psychology Press

Henry, C. S., Huynh, K. P. and Nicholls, G. (2017) Bitcoin awareness and usage in Canada. Bank of Canada topics: Bank notes, Digital Currencies, Econometrics and statistical methods

Henry, C., Huynh, K. and Nicholls, G. (2017) Bitcoin Awareness and Usage in Canada. Bank of Canada Staff Working Paper 2017-56

Hershatter, A. and Epstein, M. (2010) Millennials and the World of Work: An Organization and Management Perspective. Journal of Business Psychology, 211–223, 25

Hertzog, M. (2008) Considerations in Determining Sample Size for Pilot Studies. Research in Nursing & Health, 180-191, 31

Hileman, G. and Rauchs, M. (2017) 2017 Global cryptocurrency benchmarking study. University of Cambridge, Judge Business School

Hill, R. P. (2002). Managing across generations in the 21st century: important lessons from the ivory trenches. Journal of Management Inquiry, 60–66, 11(1)

Hira, T. K. (2012) Promoting sustainable financial behaviour: implications for education and research. International Journal of Consumer Studies, 502 – 507, 36 (5)

Hirshleifer, D. (2015) Behavioral Finance. Annual Review of Financial Economics, 133 – 159, 7

Hoegen, A., Steininger, D. and Veit, D. (2018) How do investors decide? An interdisciplinary review of decision-making in crowdfunding. Electronic Markets, 339-365, 28 (3)

Hoffman, D. D., Singh, M. and Prakash, C. (2015) The interface theory of perception. Psychon Bull Rev, 1480 – 1506, 22

Hogaboam, L., Ragel, B. and Daim, T. (2014) Development of a Hierarchical Decision Modeling (HDM) for health technology assessment (HTA) to design and implement a new patient care database for low back pain. Proceedings of PICMET ’14 Conference: Portland International Center for Management of Engineering and Technology, Infrastructure and service integration, Kanazawa, Japan, 3511 – 3517

Holton, J. and Walsh, I. (2017) Classic grounded theory: Applications with Qualitative and Quantitative data. SAGE Publications

Hooker, R. H. (2017) The determinants and implications of millennials’ stock market investment habits and opinions. Appalachian State University

Hothersall, S. J. (2018) Epistemology and social work: enhancing the integration of theory, practice and research through philosophical pragmatism. European Journal of Social Work, 22 (5)

Howe, N., & Strauss, W. (2003) Millennials go to college. American Association of Collegiate Registrars and Admissions Officers, Washington DC

Hsu, M. H. (2004) Internet self-efficacy and electronic service acceptance. Decis Support Syst, 38

Hsu, M. H., Yen, C. H., Chiu, C. M. and Chang, C. M. (2006) A longitudinal investigation of continued online shopping behavior: an extension of the theory of planned behavior. International Journal of Human – Computer Studies, 889 – 904, 64 (9)

Hulten, B. (2011) Sensory marketing: The multi-sensory brand-experience concept. European Business Review, 256 – 273, 23

Iacobucci, D. and Churchill, G. A. (2018) Marketing Research: Methodological Foundations. 12th Edition

Ichwan, I. and Kasri, R. (2019) Why are youth intent on investing through peer to peer lending? Evidence from Indonesia. Journal of Islamic Monetary Economics and Finance, 741 – 762, 5 (4)

Islam, J. U. and Rahman, Z. (2017) Awareness and willingness towards Islamic banking among Muslims: An Indian perspective. International Journal of Islamic and Middle Eastern Finance and Management, Emerald Group Publishing Limited, 92 – 101, 10 (1)

Iyengar, R., Han, S. and Gupta, S. (2009) Do friends influence purchases in a social network? Harvard Working Paper

Jalal, R. N. U. D., Sargiacomo, M., Sahar, N. U. and Fayyaz, U. E. R. (2020) Herding Behavior and Cryptocurrency: Market Asymmetries, Inter-Dependency and Intra-Dependency. The Journal of Asian Finance, Economics, and Business, 27–34, 7 (7)

Janssen, M., Mäntymäki, M., Hidders, J., Klievink, B., Lamersdorf, W., Van Loenen, B. and Zuiderwijk, A. (2015) Open and big data management and innovation. 14th IFIP WG 6.11 conference on E-Business, E-Services, and E-Society, I3E 2015, Delft, the Netherlands. Proceedings, 9373, Springer

Jariyapan, P., Mattayaphutron, S., Gillani, S. N. and Shafique, O. (2022) Factors influencing the behavioral intention to use cryptocurrency in emerging economies during the Covid-19 pandemic: Based on Technology Acceptance Model 3, Perceived Risk and Financial Literacy. Frontiers in Psychology, 12

Jebran, J. K. and Hossain, M. A. (2012) Consumer's perception on general banking activities of commercial banks: A study in the banking context of Bangladesh. European Journal of Business and Management, 4 (7)

Jeong, S. H. and Choi, I. H. (2019) Cognitive bias in decision making according to change of tax policy: An exploratory study. Journal of System and Management Sciences, 127 – 137, 9 (4)

Jhamb, D., Aggarwal, A., Mittal, A. and Paul, J. (2020) Experience and attitude towards luxury brands consumption in an emerging market. European Business Review, 909 – 936, 32 (5)

Jiang, H. and Verardo, M. (2018) Does herding behavior reveal skill? An analysis of mutual fund performance. The Journal of Finance, 73 (5)

Jin, L. Y., Osman, A. B. and Halim, M. S. B. (2014) Perceived usefulness and trust towards consumer behaviors: A perspective of consumer online shopping. Journal of Asian Scientific Research, 541 – 546, 4 (10)

Johannesson, P. and Perjons, E. (2014) An introduction to design science, 10

John, K., O'Hara, M. and Saleh, F. (2022) Bitcoin and Beyond. Annual Review of Financial Economics, 95 – 115, 14

Johnson, R. B., Onwuegbuzie, A. J. and Turner, L. (2007) Toward a definition of mixed methods research. Journal of Mixed Methods Research, 112 – 133, 1 (2)

Jonker, N. (2018) What drives Bitcoin adoption by retailers? De Netherlandsche Bank. Payments and Market Infrastructures Division, 585

Josef, A. K., Richter, D., Samanez-Larkin, G. R., Wagner, G. G., Hertwig, R. and Mata, R. (2016) Stability and Change in Risk-taking propensity across the adult lifespan. J Pers Soc Psychol, 430 – 450, 111 (3)

Joshi, A., Kale, S., Chandel, S. and Pal, D. K. (2015) Likert Scale: Explored and Explained. British Journal of Applied Science and Technology, 396 – 403, 7 (4)

Jung, C. G. (1923). Psychological Types: Or the Psychology of Individuation.

Jusoh, Z. M. and Ling, G. H. (2012) Factors influencing consumers' attitude towards e-commerce purchases through online shopping. International Journal of Humanities and Social Science, 2 (4)

Juwita, R., Dwianti, L., Mandang, J. Z., Yahya, M. S. and Triadi, M. R. (2022) Investment decision of cryptocurrency in millennials and Gen Z. Advances in Social Science, Education and Humanities Research

Kaakeh, A., Hassan, M. K. and van Hemmen Almazor, S. F. (2018) Attitude of Muslim minority in Spain towards Islamic finance. International of Islamic and Middle Eastern Finance and Management, 213 – 230, 11 (2)

Kaba, B. and Osei-Bryson, K. M. (2013) Examining influence of national culture on individuals' attitude and use of information and communication technology: Assessment of moderating effect of culture through cross countries study. International Journal of Information Management, 441 – 452, 33 (3)

Kabra, G., Mishra, P. and Dash, Manoj (2010) Factors influencing investment decision of generations in India: An econometric study. Asian Journal of Management Research, 305 – 326, 4

Kahneman, D. and Tversky, A. (1979) Prospect Theory: An analysis of Decision under Risk. The Econometric Society, 263 – 292, 47 (2)

Kanungo, S. and Jain, V. (2004) Relationship between risk and intention to purchase in an online context: role of gender and product category, 893 – 905

Katsiampa, P., Corbet, S. and Lucey, B. M. (2019) Volatility spillover effects in leading cryptocurrencies: A BEKK-MGARCH analysis. Finance Research Letters, 29 (1)

Kazerani, A., Rosati, D. and Lesser, B. (2017) Determining the usability of Bitcoin for beginners using change tip and coinbase

Kettunen, M. and Kriikkula, S. (2020) Preparing for the future: Millennials' means of seeking financial security. University Centre Hämeenlinna

Khairuddin, I. (2019) Understanding and designing for trust in bitcoin blockchain. PhD, Lancaster University

Khairuddin, I. E, Sas, C., Clinch, S. and Davies, N. (2016) Exploring motivations among bitcoin users. Conference: ACM CHI 2016, CA, USA

Khairuddin, I. E. and Sas, C. (2015) Exploring trust in bitcoin technology: A framework for HCI Research. Computer Human Interaction Special Interest Group of the Ergonomics Society of Australia

Khairuddin, I. E., Sas, C., Clinch, S. and Davies, N. (2016) Exploring motivations among bitcoin users. Conference: ACM CHI 2016

Khan, I. and Fatma, M. (2017) Antecedents and outcomes of brand experience: an empirical study. Journal of Brand Management, Palgrave Macmillan, 439 – 452, 24 (5)

Khan, I. U., Hameed, Z. and Khan, S. U. (2017) Understanding online banking adoption in a developing country: UTAUT2 with Cultural Moderators. Journal of Global Information Management (JGIM), 43 – 65

Kharpal, A. (2018) Apple co-founder Steve Wozniak hopes bitcoin will become a single global currency. CNBC. Available at: https://www.cnbc.com/2018/06/04/apple-co-founder-steve-wozniak-hopes-bitcoin-will-become-global-currency.html (Accessed: 12th Decemeber 2020)

Khoa Cuong, P. and Jian, Z. (2014) Factors influencing individual investors' behavior: An empirical study of the Vietnamese stock market. American Journal of Business and Management, 3 (2)

Kim, H. J., Hong, S. J., Hwang, H. C., Kim, S. M. and Han, D. H. (2020) Comparison of Psychological Status and Investment Style Between Bitcoin Investors and Share Investors. Frontiers Psychology. Personality and Social Psychology, 17

Kim, J. E., Lloyd, S. and Cervellon, M. C. (2015) Narrative-transportation storylines in luxury brand advertising: Motivating consumer engagement. Journal of Business Research, 69 (1)

Kim, M. (2021) A psychological approach to Bitcoin usage behavior in the era of Covid-19: Focusing on the role of attitudes toward money. Journal of Retailing and Consumer Services, 62

Kinderis, M., Bezbradica, M. and Crane, M. (2018) Bitcoin Currency Fluctuation. Conference: 3rd International Conference on Complexity, Future Information Systems and Risk

Kishore, K. and Sequeira, A. H. (2016) An empirical investigation on mobile banking service adoption in rural Karnataka. SAGE Open, 6 (1)

Kocaoglu, D. F. (2015) Hierarchical decision modeling : essays in honor of Dundar F. Kocaoglu. Innovation, Technology, and Knowledge Management. Springer International Publishing Switzerland, Springer Cham, ISSN 2197-5698, 1

Koenraadt, J. and Leung, E. (2022) Investor reactions to crypto token regulation. European Accounting Review

Korniotis, G. M. and Kumar, A. (2011) Do older investors make better investment decisions? The Review of Economics and Statistics, 244 – 265, 93 (1)

Korniotis, G. M. and Kumar, A. (2013) State-level business cycles and local return predictability. The Journal of Finance, 1037 – 1096, 68 (3)

Kotwani, S. (2018) A study of stock market investors' perception towards price and term of the investment. International Journal of Science, Engineering and Management, 3 (5)

Krafft, P. M., Penna, N. D. and Pentland, A. (2018) An experimental study of cryptocurrency market dynamics

Kraus, N., Malmfors, T. and Slovic, P. (1992) Intuitive toxicology: expert and lay judgments of chemical risk. Risk Analysis, 215 – 231, 12

Kreimer, S. F. (2006) Censorship by proxy: The first amendments, internet intermediaries, and the problem of the weakest link. University of Pennsylvania Law Review, 11 – 101, 155 (1)

Kristoufek, L. (2013) Bitcoin meets Google trends and Wikipedia: Quantifying the relationship between phenomena of the Internet era. Sci Rep, 3415, 3

Kristoufek, L. (2015) What are the main drivers of the Bitcoin Price? Evidence from Wavelet Coherence Analysis. Plos One, e0123923, 10 (4)

Krombholz, K., Judmayer, A., Gusenbauer, M. and Weippl, E. (2017) The other side of the coin: User experiences with bitcoin security and privacy, 555 – 580

Krueger, N. F. Jr and Dickson, O. (1994) How believing in ourselves increases risk taking: self-efficacy and perceptions of opportunity and threat. Decision Sciences, 385 – 400, 25

Ku-Mahamud, K., Omar, M., Abu Bakar, N. A. and Muraina, I. (2019) Awareness, Trust, and Adoption of Blockchain Technology and Cryptocurrency among Blockchain Communities in Malaysia. International Journal on Advanced Science, Engineering and Information Technology, 1217, 9 (4)

Kumari, A., Ranjan, P., Vikram, N. K., Kaur, D., Sahu, A., Dwivedi, S. N., Baitha, U. and Goel, A. (2020) A short questionnaire to assess changes in lifestyle-related behaviour during Covid-19 pandemic. Diabetes Metab Syndr, 14 (6)

Kwon, H. S. and Chidambaram, L. (2000) A test of the Technology Acceptance Model: the case of cellular telephone adoption. In proceedings of the 33rd Annual Hawaii International Conference on System Sciences, 7

Lam, M. (2018) Influence of anchoring bias on Bitcoin investors' trading decision

Lammer, D., Hanspal, T. and Hackethal, A. (2019) Who are the Bitcoin investors? Evidence from Indirect cryptocurrency investments. SSRN Electronic Journal

Laroche, M., Kim, C., Zhou L. (1996) Brand familiarity and confidence as determinants of purchase intention: An empirical test in a multiple brand context. Journal of Business Research, 115 – 120, 37 (2)

Larson, L. E., Anastasia, N. and Wijaya, S. (2020) Female workers' readiness for retirement planning: an evidence from Indonesia. Review of Behavioral Finance, 1 – 24, 13

Lee Kou Chuen, D. and Teo, E. G. S. (2015) Emergence of Fintech and the LASIC Principles. Journal of Financial Perspectives, 3 (3)

Lee, M., Bellens, J., Wightman, M. and Nott, V. (2023) How can today's millennial investors drive tomorrow's business growth? EY Global Wealth Research Report. Available at: https://www.ey.com/en_gl/insights/wealth-asset-management/global-wealth-research-millennial-trends (Accessed: 11th April 2024)

Legris, P., Ingham, J. and Collerette, P. (2003) Why do people use information technology? A critical review of the Technology Acceptance Model. Information & Management, 191 – 204, 40

Lenhart, A., Purcell, K., Smith, A. and Zickuhr, K. (2010) Social Media and Mobile Internet use among teens and young adults. Pew Internet and American Life Project

Leung, L. (2004) Net-Generation Attributes and Seductive Properties of the Internet as Predictors of Online Activities and Internet Addiction. Cyberpsychology & Behavior, 333-348, 7

Li, X. and Wang, C. A. (2017) The technology and economic determinants of cryptocurrency exchange rates: The case of Bitcoin. Decision Support System, 49–60, 95

Li, Y. M., Lee, J. and Cube, B. J. (2002) Intention to adopt online trading: Identifying the Future online traders. Association for Financial Counselling and Planning Education

Lin, Z. Y. (2021) Investor attention and cryptocurrency performance. Finance Research Letters, 40

Linciano, N., Lucarelli, C., Gentile, M. and Soccorso, P. (2018) How financial information disclosure affects risk perception. Evidence from Italian investors' behaviour. The European Journal of Finance, 1 – 22

Linden, S. V. D. (2014) On the relationship between personal experience, affect and risk perception: The case of climate change. European Journal of Social Psychology, The social psychology of climate change

Litwack, S. (2015) Bitcoin: currency or fool's gold? A comparative analysis of the legal classification of bitcoin. Temp. Int'l & Comp

Liu, Y. and Tsyvinski, A. (2021) Risks and returns of cryptocurrency. The Review of Financial Studies, 2689 – 2727, 34 (6)

Lu, L. C., Chang, W. P. and Chang, H. H. (2014) Consumer attitudes toward blogger's sponsored recommendations and purchase intention: The effect of sponsorship type, product type, and brand awareness. Computers in Human Behavior, 258 – 266, 34

Lukyanenko, R., Larsen, K. R., Parsons, J. and Gefen, D. (2019) Toward creating a general ontology for research validity. Conference: Conceptual Modeling

Lusardi, A. and Mitchell, O. (2010) Financial literacy among the Young. Journal of Consumer Affairs, 358 – 380, 44 (2)

Lusardi, A. and Mitchell, O. (2011) Financial literacy around the world: an overview. Journal of Pension Economics and Finance. Cambridge University Press, 497 – 508, 10 (4)

Luther, W. and Salter, A. (2017) Bitcoin and bailout. The Quarterly Review of Economics and Finance, 50-56, 66

Lyons, S. and Kuron, L. (2014) Generational differences in the workplace: A review of the evidence and directions for future research. Journal of Organizational Behavior, 139–S157, 35

MacDonald, S., & Headlam, N. (2014) Research Methods Handbook, Introductory Guide to Research Methods for Social Research. Centre for Local Economic Strategies

Mahardhika, A. S. and Zakiyah, T. (2020) Millennials' Intention in Stock Investment: Extended Theory of Planned Behavior. Riset Akuntansi dan Keuangan Indonesia, 83 – 91, 5 (1)

Mahastani, L. and Hariady, E. (2014) Determining the factors which affect the stock investment decisions of potential female investors in Indonesia. International Journal of Process Management and Benchmarking, 186 – 197, 4 (2)

Mai, E. (2019) Connections Between Stock Market and Bitcoin Market. Master's thesis, Radboud University, Nijmegen

Majid, M. A. A., Othman, M., Mohamad, S. F. and Lim, S. (2017) Piloting for interviews in qualitative research: Operationalization and lessons learnt. International Journal of Academic Research in Business and Social Sciences, 1073 – 1080, 7 (4)

Mallick, S. (2020) Causal relationship between cryptocurrencies: an analytical study between Bitcoin and Binance Coin. Journal of Contemporary Issues in Business and Government, 26 (02)

Malmendier, U. and Nagel, S. (2016) Learning from inflation experiences. The Quarterly Journal of Economics, 53 – 87, 131(1)

Mandrik, C. and Bao, Y. (2005) Exploring the concept and measurement of general risk aversion. Advances in consumer research. Association for Consumer Research, 531 – 539, 32 (1)

Markiewicz, Ł. and Weber E. U. (2013) DOSPERT's gambling risk-taking propensity scale predicts excessive stock trading. Journal of Behavioural Finance, 65–78, 14

Marshall, C. and Rossman, G.B. (2014) Designing Qualitative Research. SAGE Publications

Martin, T. H. (2018) Investing in Millennials. Fintech and Big Data. University of New Hampshire

Masood, A. and Lodhi, R. N. (2016) Determinants of behavioral intentions to use SPSS among students: Application of Technology Acceptance Model (TAM). FWU Journal of Social Sciences, 146 – 152, 10 (2)

Masrom, M. (2007) Technology acceptance model and e-learning. 12th International Conference on Education, 21

Mathieson, K. (1991) Predicting user intentions: comparing the Technology Acceptance Model with the Theory of Planned Behavior. Information Systems Research, 173 – 191, 2

Mattke, J., Maier, C., Reis, L. and Weitzel, T. (2020) Bitcoin investment: a mixed methods study of investment motivations. European Journal of Information Systems, 30(3), 261–285

Mavilia, R. and Pisani, R. (2020) Blockchain and catching-up in developing countries: The case of financial inclusion in Africa. African Journal of Science, Technology, Innovation and Development, 151-163, 12 (2)

Mazambani, L. and Mutambara, E. (2019) Predicting Fintech innovation adoption in South Africa: the case of cryptocurrency. African Journal of Economic and Management Studies, Emerald Group Publishing Limited, 30 – 50, 11 (1)

McCrae, R. R., Costa, P. T., Jr., Terracciano, A., Parker, W. D., Mills, C. J., De Fruyt, F. and Mervielde, I. (2002) Personality trait development from age 12 to age 18: Longitudinal, cross-sectional and cross-cultural analyses. Journal of Personality and Social Psychology, 1456–1468, 83 (6)

Md Husin, M. and Rahman, A. A. (2016) Predicting intention to participate in family takaful scheme using decomposed theory of planned behaviour. International Journal of Social Economics, Emerald Group Publishing Limited, 1351 – 1366, 43 (12)

Mendoza-Tello, J. C., Higinio, M., Pujol, F. A. and Lytras, M. D. (2018) Social commerce as a driver to enhance trust and intention to use cryptocurrencies for electronic payments. IEEE Access, 6

Merkle, C. (2018) The curious case of negative volatility. Journal of Financial Markets, 92 – 108, 40

Merriam, S. B. and Tisdell, E. J. (2016) Qualitative Research: A guide to design and implementation. 4th Edition, San Francisco, CA: Jossey-Bass

Meyer, S., Wagener, M. and Weinhardt, C. (2014) Politically Motivated Taxes in Financial Markets: The Case of the French Financial Transaction Tax. Journal of Financial Services Research, 177–202, 47 (2)

Mian, X. (2020) In Search of The Perfect Coin: China's Approach Towards Cryptocurrency and Its Own Central Bank Digital Currency. Banking & Finance Law Review, Bank for International Settlements, 420 – 456, 36

Mitchell, A. (2018) A review of mixed methods, pragmatism and abduction techniques. Academic Conferences International Limited, 16 (3)

Mogul, Z., Kronfellner, B., Buser, M., Lai, C., Wee, K., Rhode, W., Burchardi, K., Golebiowska, A., Vallabhaneni, P., Wagner, J. and Abedine, A. (2020) How banks can succeed with cryptocurrency. Available at: https://www.bcg.com/publications/2020/how-banks-can-succeed-with-cryptocurrency (Accessed: 1st May 2021)

Mohan, M. and Bhatt, S. (2019) An empirical analysis of online shopping behavior in India: a demographic perspective

Mohan, S. and Tp, J. (2022) Awareness and perception of investors towards mutual fund investments. International Journal of Advanced Research in Science Communication and Technology, 2 (2)

Mohannad, A. D., Arqawi, S. and Karsh, S. A. (2020) Fintech in the eyes of millennials and Generation Z (the financial behavior and Fintech perception). Banks and Bank systems, 20 – 28, 15 (3)

Morgan, D. L. (2014) Pragmatism as a Paradigm for Social Research. Qualitative Inquiry, 1045-1053, 20 (8)

Morse, W. C. (1998) Risk taking in personal investments. Journal of Business and Psychology, 281 – 288, 13 (2)

Mostwin, D. (1993) Thomas and Znaniecki's "The Polish Peasant in Europe and America": Survival of the Book. Polish American Studies, 75–84, 50 (1)

Moueed, A. and Hunjra, A. I. (2019) Use anger to guide your stock market decision-making: results from Pakistan. Cogent Economics and Finance, 8 (1)

MSCI (2020) Millennials, Demographic change and the impact of a generation. Thematic Insights. Available at: https://www.msci.com/documents/1296102/23766493/ThematicIndexInsight-millenials-cbr-en.pdf (Accessed: 11th April 2021)

Muhammad, A. F., Norazha, P., Zarina, O. (2020) Bitcoin and cryptocurrency: Challenges, opportunities and future works. Journal Of Asian Finance, Economics and Business, 7 (8)

Mullins, L.J. (2013) Management and organizational behaviour. Harlow: FT Prentice Hall

Murko, A. and Vrhovec, S. (2019) Bitcoin adoption. Proceeding of the Third Central European Cybersecurity Conference, 1 - 6

Ng, E., Kuron, L., Lyons, S. and Schweitzer, L. (2015) Millennials' work values: differences across the school to work transition. Personnel Review, 991 – 1009, 44 (6)

Noble, S., Haytko, D. and Phillips, J. (2009) What drives college-age Generation Y consumers? Journal of Business Research, 617 – 628, 62 (6)

Norisnita, M. and Indriati, F. (2022) Application of Theory of Planned Behavior (TPB) in cryptocurrency investment prediction: a literature review. Economics and Business Quarterly Reviews, 5 (2)

Nugraha, V. A. and Prasetyaningtyas, S. W. (2023) Analysis of factors influencing investment intention in cryptocurrency: A Theory of Planned Behavior (TPB) approach. Jurnal Ekonomi, 12 (2)

Nugroho, M. A. and Novitasari, B. T. (2023) Fintech risks and continuance to use on Generation Z. Journal of Law and Sustainable development. ISSN: 2764-4170

Obamuyi, T. (2013) Factors Influencing Investment Decisions in Capital Market: a study of individual investors in Nigeria. Organizations and Markets in Emerging Economies, 141 – 161, 4 (1)

Ober, M., Katzenbeisser, S. and Hamacher, K. (2013) Structure and Anonymity of the Bitcoin Transaction Graph. Future Internet, 237-250, 5 (2)

Oehler A., Wendt S., Wedlich F. and Horn M. (2018) Investors' personality influences investment decisions: Experimental evidence on extraversion and neuroticism. Journal of Behaviour Finance, 30–48, 19 (2)

Ohman, S. (2017) Previous experiences and risk perception: the role of transference. Journal of Education, Society and Behavioural Science, 1 – 10, 23

Olafsson, A. and Pagel, M. (2023) The Ostrich in us: Selective attention to financial accounts, income, spending and liquidity. National Bureau of Economic Research. NBER Working Paper No. 23945

Olsen, R. A. (2011) Financial risk perceptions: A behavioral perspective. Advances in Entrepreneurial Finance: With applications from behavioral finance and economics, 45 – 67

Oney, E., Oksuzoglu Guven, G. and Hussain Rizvi, W. (2017) The determinants of electronic payment systems usage from consumers' perspective. Economic Research-Ekonomska Istrazivanja, 394 – 415, 30 (1)

Ong, C. S. and Lai, J. Y. (2006) Gender differences in perceptions and relationships among dominants of E-learning acceptance. Computers in Human behavior, 816 – 829, 22

Onwuegbuzie, A. J., Bustamante, R. M. and Nelson, J. A. (2010) Mixed research as a tool for developing quantitative instruments. Journal of Mixed Methods Research, 56 – 78, 4 (1)

Onwuegbuzie, A. J., Tucker, S. A., Johnson, R. B. and Icenogle, M. L. (2014). Conducting mixed methods research: Using dialectical pluralism and social psychological strategies. In P. Leavy (Ed.), The Oxford handbook of qualitative research, 557–578

Ooi, S. K., Ooi, C. A. and Yeap, J. A. L. (2021) Embracing bitcoin: users' perceived security and trust. Quality & Quantity, 1219 – 1237, 55

Padmaja, R. (2013). A study of Consumer Behavior towards Mutual Funds with special reference to ICICI Prudential Mutual Funds, Vijayawada. International Journal of Management Research and Business Strategy, 1-14, 2 (2)

Palinkas, L.A., Horwitz, S. M., Green, C. A., Wisdom, J. P., Duan, N. and Hoagwood, K. (2013) Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research. Administration and Policy in Mental Health and Mental Health Services Research, 533-544, 42

Parashar, N. and Rasiwala, F. (2018) A study on investor's awareness and perception regarding investment in cryptocurrency with special reference to bitcoin. International Journal of Scientific and Research Publications, 8 (12)

Parashar, N., & Rasiwala, F. (2018) A study on investor's awareness and perception regarding investment in Crypto currency with special reference to Bitcoin. International Journal of Scientific and Research Publications (IJSRP), 311-319, 8 (12)

Parasuraman, A., Zeithaml, V. and Malhotra, A. (2005) E-S-QUAL: A multiple-item scale for assessing electronic service quality. Journal of Service Research, 7 (3)

Paschalie, L. E. and Santoso, A. S. (2020) Cryptocurrencies as investment instrument: A social commerce and subsription-based service perspective. Journal of Business & Economic Analysis, 106 – 132, 3 (2)

Pascual-Ezama, D., Liano, B. G. G. d. and Scandroglio, B. (2014) Can we predict individual investors' behavior in stock markets? A psychological approach. Universitas Psychologica, 25 – 35, 13 (1)

Patel, K. and Patel, H. J. (2017) Adoption of internet banking services in Gujarat: An extension of TAM with perceived security and social influence. International Journal of Bank Marketing, 36 (1)

Patil, P. (2019) Attitude of the millennial generation towards cryptocurrency. Dublin Business School. Available at: https://esource.dbs.ie/bitstream/handle/10788/3817/mba_patil_p_2019.pdf?sequence=1&isAllowed=y (Accessed: 30th April 2020)

Patridge, L. and Ho, P. S. (2003) A retail investors' perspective on the acceptance of internet stock trading. In System Sciences. Proceedings of the 36th annual Hawaii International Conference on 1, 11 – 22

Patton, M. Q. (2002) Qualitative research and evaluation methods. 3rd Edition, SAGE Publications

Pavlou, P. A. (2003) Consumer Acceptance of Electronic Commerce: Integrating trust and risk with the Technology Acceptance Model. International Journal of Electronic Commerce, 101 – 134, 7

Pedhazur, E. J. and Schmelkin, L. P. (2013) Measurement, Design, and Analysis: An Integrated Approach. Psychology Press, Hove

Pellinen, A., Tormakangas, K., Uusitalo, O. and Raijas, A. (2011) Measuring the Financial Capability of Investors: A case of the customers of Mutual Funds in Finland. International Journal of Bank Marketing, 107 – 133, 29

Pertiwi, T. K. and Purwanto, E. (2021) Analysis of adopting Millennial generation financial technology (Fintech) services. International Journal of Business Management and Economic Review, 4 (3)

Pezzani, F. (2018) Bitcoin: the bewildering illusion of easy wealth. Acad Sci J, 1109–1113, 3

Pham, Q. T., Phan, H. H., Cristofaro, M., Misra, S. and Giardino, P. L. (2021) Examining the intention to invest in cryptocurrencies: An extended application of the theory of planned behavior on Italian independent investors. International Journal of Applied Behavior Economics, 21, 10 (3)

Pichet, E. (2017) Bitcoin: Speculative Bubble or Future Value? The Conversation (French edition)

Pickens, J. (2005) Attitudes and Perceptions. Organizational Behavior in Health Care. Jones and Bartlett Publishers, Sudbury, 43-75

Polit, D. and Beck, C. (2012) Data Collection in Quantitative Research. In: Polit, D. and Beck, C., Edition. Nursing Research, Generating and Assessing Evidence for Nursing Practice, 9th Edition, Wolters Kluwer Health/Lippincott Williams and Wilkins, Philadelphia, 293-327

Presthus, W. and O'Malley, N. (2017) Motivations and Barriers for End-User Adoption of Bitcoin as Digital currency. Procedia Computer Science, 89-97, 121

Puteh, F. and Ong, M. H. B. A. (2017) Quantitative Data Analysis: Choosing between SPSS, PLS and AMOS in Social Science Research. 3

Putra, R., Hin, J., Herawati, S. and Tamara, D. (2021) Financial literacy and risky investment decision making of millennials in Indonesia mediated by information search. Turkish Journal of Computer and Mathematics Education, 695 – 705, 12 (10)

Rachmawati, M., Nugroho, F. J., Supriyanto, E. E., Saksono, H., Cahyo, A. N., Natalia, F., Windy, E. (2021) ICLSSEE, Proceedings of the 1st International Conference on Law, Social Science, Economics, and Education. EAI, Indonesia

Rahman, M. A., Islam, Md. A., Esha, B. H. and Sultana, H. (2018) Consumer buying behavior towards online shopping: An empirical study on Dhaka City, Bangladesh. Cogent Business and Management, 1-22, 5(1)

Rai, K., Dua, S. and Yadav, M. P. (2019) Association of financial attitude, financial behaviour and financial knowledge towards financial literacy: A structural equation modeling approach. FIIB Business Review, 8 (1)

Rajeh, M. T. (2022) Modeling the theory of planned behavior to predict adults' intentions to improve oral health behaviors. BMC Public Health, 1391, 22

Rana, S. (2019) Factors affecting individual investors' stock investment decision in Nepal. Tribhuvan University Journal, 103 -124, 33

Rao, A., Gupta, M., Sharma, G. D. and Mahendru, M. (2022) Revisting the financial market interdependence during Covid-19 times: A study of Green bonds, cryptocurrency, commodities, and other financial markets. International Journal of Managerial Finance, 18

Rao, R. K. (2020) Aesthetics in stock investments: the mediating role of investor's attitude towards investor relation websites. Test Engineering and Management, 83

Reed, M. (2005) Reflections on the 'Realist Turn' in Organization and Management Studies. Journal of Management Studies, Wiley Blackwell, 1621 – 1644, 42 (8)

Rehman, A. and Alharthi, K. (2016) An introduction to research paradigms

Rekik, Y. (2013) Determinants of Individual Investors' Behaviors: Evidence from Tusisian Stock Market. IOSR Journal of Business and Management, 109 – 119, 8

Restrepo, D., Correia, R. and Poblacion, J. (2012) Political risk and corporate investment decisions. Universidad Carlos III De Madrid, 4 (3)

Reyna, V. F. and Lloyd, F. J. (2006) Physician decision making and cardiac risk: Effects of knowledge, risk perception, risk tolerance, and fuzzy processing. Journal of Experimental Psychology: Applied, 179 – 195, 12

Riaz, S., Riaz, A., Parkash, R. and Ahmad, M. J. (2020) Determinants of Stock Market Investors' Behavior in Covid-19: A study on the Pakistan Stock Exchange. International Journal of Disaster Recovery and Business Continuity, 977 – 990, 11 (3)

Richa, D. (2012) Impact of demographic factors of consumers on online shopping behaviour: A study of consumers in India

Romano, V. (2024) Where in Europe are people investing in crypto the most? Euronews.business. Available at: https://www.euronews.com/business/2024/03/05/where-in-europe-are-people-investing-in-crypto-the-most#:~:text=Within%20Europe%2C%20it%20varies%20widely,biggest%20fans%20of%20crypto%20investments. (Accessed: 12th April 2024)

Ron, D. and Shamir, A. (2012) Quantitative Analysis of the Full Bitcoin Transaction Graph. The Weizmann Institute of Science, Israel

Rosdiana, R. (2020) Investment behavior in generation Z and millennial generation. Dinasti International Journal of Economics, Finance and Accounting, 1 (5)

Rosenberg, M.J. and Hovland, C.I. (1960) Cognitive, Affective and Behavioral Components of Attitudes. In: Rosenberg, M.J. and Hovland, C.I., Eds., Attitude Organization and Change: An Analysis of Consistency among Attitude Components, Yale University Press, New Haven

Russell-Jones, L. (2023) HMRC says time's up for crypto investors. The Times. Available at: https://www.thetimes.co.uk/article/crypto-currency-news-uk-tax-hmrc-capital-gains-interest-fine-sqbp5mwpn#:~:text=You%20may%20face%20this%20levy,rate%20taxpayers%2020%20per%20cent (Accessed: 23rd December 2023)

Ryu, H. S. and Ko, K. S. (2019) Understanding speculative investment behavior in the bitcoin context from a dual-systems perspective. Industrial Management and Data Systems, 1431 – 1456, 119 (7)

Ryu, K., Lee, H. R. and Kim, W. G. (2012) The influence of the quality of the physical environment, food, and service on restaurant image, customer perceived value, customer satisfaction, and behavioral intentions. International Journal of Contemporary Hospitality Management, 200 - 223, 24 (2)

Sabirzyanov, R. (2016) Islamic financial products and services patronizing behavior in Tatarstan: The role of perceived values and awareness. Journal of King Abdulaziz University-Islamic Economics, 111 – 125, 29

Sabri, N. A. A. (2016) The relationship between the level of financial literacy and investment decision-making millennials in Malaysia. Taylor's Business Review, 39 – 47, 6

Sadiq, M. N. and Khan, R. A. A. (2018) Financial literacy, risk perception and investment intention among youth in Pakistan. International Journal of Management Sciences and Business Research, 7 (5)

Safdar, Z., Malik, B. F., Ayub, H. and Ellahi, A. (2023) Investing in the future: a holistic examination of personal and behavioral influences on cryptocurrency investment, with a focus on social influence and crypto expert guidance. Migration Letters, 987 – 1009, 20

Safeena, R., Date, H., Hundewale, N. and Kammani, A. (2013) Combination of TAM and TPB in Internet Banking Adoption. International Journal of Computer Theory and Engineering, 146 – 150, 5

Salisbury, W., Pearson, R., Pearson A. and Miller, D. (2001) Perceived security and World Wide Web purchase intention. Industrial Management and Data Systems, 165 – 177, 101

Sanayei, A. and Bahmani, E. (2012) Integrating TAM and TPB with perceived risk to measure customers' acceptance of internet banking. International Journal of Information Science and Management

Sanchez, R. P. (2018) Technology behavior of millennials: An approach through the uses and gratifications theory. Doctoral Program in Economic Analysis and Business Strategy, Universidade da coruna

Saputra, F. (2024) Financial Management Behavior of Millennials. International Journal of Business, Law and Education, 5 (1)

Saputra, G. W. and Maradona, A. F. (2023) The effect of herding behavior on millennial generation intentions in investing crypto assets. International Journal of Social Science and Business, 326 – 334, 7 (2)

Sas, C. and Khairuddin, I. (2017) Design for Trust: An Exploration of the Challenges and Opportunities of Bitcoin users. Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems, 6499-6510

Sas, C. and Khairuddin, I. E. (2015) Exploring trust in bitcoin technology: A framework for HCI Research. Conference: Proceedings OZCHI Conference 2015. Computer Human Interaction Special Interest Group of the Ergonomics Society of Australia

Saunders, M., Lewis, P. and Thornhill, A. (2016) Research Methods for Business Students. 7th Edition, Pearson, Harlow

Saunders, M.N.K., Lewis, P. and Thornhill, A. (2019) Research Methods for Business Students. 8th Edition, Pearson, New York

Schaupp, L. C. and Festa, M. M. (2018) Cryptocurrency adoption and the road to regulation. Conference: the 19th Annual International Conference

Schewe, C., Meredith, G. E. and Stephanie, N. (2000) Defining moments: segmenting by cohorts. Marketing management, 48 – 53, 9

Schmidt, N. (2010) What drives investments into mutual funds? Applying the theory of planned behaviour to individuals' willingness and intention to purchase mutual funds. In Conference Proceeding

Schroeder, L. D., Sjoquist, D. L. and Stephan, P. E. (2017) Understanding Regression Analysis: An Introductory Guide

Schuh, S. and Shy, O. (2015) U.S consumers' adoption and use of bitcoin and other virtual currencies. Bank of Canada

Schwarz, N. (1990) Feelings as information: Informational and motivational functions of affective states. In E. T. Higgins and R. Sorrentino, Handbook of motivation and cognition: Foundations of social behavior, New York: Guildford Press

Selim, H. M. (2007) Critical success factors for e-learning acceptance: Confirmatory factor models. Computers and Education, 396 – 413, 49 (2)

Senthilnathan, S. (2019) Usefulness of Correlation Analysis. SSRN Electronic Journal

Sentosa, I. and Mat, N. K. (2012) Examining a Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM) in Internet purchasing using Structural Equation Modeling. Researchers World, 62, 3

Setyorini, N. and Indriasari, I. (2020) Does millennials have an investment interest? Theory of planned behaviour perspective. Diponegoro International Journal of Business, 28 – 35, 3 (1)

Sewwandi, T. (2015) Behavioral Biases in Investment Decision Making: A Literature Review

Shabgou, M. and Mousavi, A. (2016) Behavioral Finance: behavioral factors influencing investors' decisions making. Advanced Social Humanities and Management, 1 – 6, 3

Shah Alam, S. and Mohamed Sayuti, N. (2011) Applying the Theory of Planned Behavior (TPB) in halal food purchasing. International Journal of Commerce and Management, 8 – 20, 21 (1)

Shaikh, A. A., Glavee-Geo, R. and Karjaluoto, H. (2018) How relevant are risk perceptions, effort, and performance expectancy in mobile banking adoption? International Journal of E-business research, 39 – 60, 14 (2)

Shanmugam, K. (1990). A Study on Investor's Awareness of Investment. Bharathiar University, India

Sharf, S. (2014) The Recession Generation: How Millennials are changing money management forever. Forbes. Available at: https://www.forbes.com/sites/samanthasharf/2014/07/30/the-recession-generation-how-millennials-are-changing-money-management-forever/ (Accessed: 3rd September 2020)

Sharma, P. C. (2019) Identification of factors influencing investors' perception towards investment in mutual fund. Journal of Commerce & Accounting Research, 18 – 24, 8 (3)

Shashwat, A., Agarwal, S., Ghosh, P. and Gupta, S. (2020) Financial inclusion and alternate credit scoring for the millennials: Role of Big Data and Machine Learning in Fintech. New York University

Shehhi, A. A., Oudah, M. and Aung, Z. (2014) Investigating factors behind choosing a cryptocurrency. Conference: 2014 IEEE International Conference on Industrial Engineering and Engineering Management

Sheikh, N., Kim, K. and Kocaoglu, D. F. (2016) Use of Hierarchical Decision Modeling to select target markets for a new personal healthcare device. Healthy Policy and Technology, 5 (2)

Shen, D., Urquhart, A. and Wang, P. (2019) Does Twitter predict Bitcoin? Economics Letters, 174

Shetty, S. K., Spulbar, C., Birau, R. and Simion, M. L. (2023) Perceived attitude of youth towards cryptocurrency investment: a case study for India. Annals of Dunarea de Jos University of Galati, Economics and Applied Informatics

Sicherman, N., Loewenstein, G., Seppi, D. J. and Utkus, S. P. (2016) Financial Attention. The Review of Financial Studies, 863 –897, 29 (4)

Silinskyte, J. (2014) Understanding Bitcoin adoption: Unified Theory of Acceptance and Use of Technology (UTAUT) application. University Leiden ICT in Business

Singal, V. S. and Manrai, R. (2018) Factors affecting investment in mutual funds. Journal of General management research, 96 – 107, 5 (2)

Singh, S., Sahni, M. M. and Kovid, R. K. (2020) What drives FinTech adoption? A multi-method evaluation using an adapted technology acceptance model. Management Decision, 1675 – 1697, 58 (8)

Sitorus, I., Purwanto, B. and Ermawati, W. (2021) Determinants of Millennials' behaviors toward peer-to-peer lending investment. Proceedings of the 1st International Conference on Law, Social Science, Economics, and Education. EAI, Indonesia

Smales, L. A. (2022) Investor attention in cryptocurrency markets. International Review of Financial Analysis, 79

Smith, M. C., Babchuk, W. A., Stevens, J., Garrett, A. L., Wang, S. C. and Guetterman, T. C. (2019) Modeling the use of mixed methods – grounded theory: developing scales for a new measurement model. Journal of Mixed Methods Research, SAGE Journals, 14 (2)

Snyder, J. S., Schwiedrzik, C. M., Vitela, A. D. and Melloni, L. (2015) How previous experience shapes perception in different sensory modalities. Frontiers in Human Neuroscience, 9

Son, W. and Sheikh, N. J. (2018) Assessment of electronic authentication policies using Multi-stakeholder, multi-criteria Hierarchical Decision Modeling. Portland International Conference on Management of Engineering and Technology, 1 – 11

Sondari, M. C. and Rahmat, d. S. (2015) Using Theory of Planned Behavior in predicting intention to invest: case of Indonesia. International Academic Research Journal of Business and Technology, 137 – 141, 1

Spradley J. P. (1979) The ethnographic interview. Holt, Rinehart & Winston, New York

Srikanjanasorn, A. and Siripanich, P. (2020) Bitcoin investment behavior in Thailand

Srivastava, P (2022) Mutual Fund Investment Behaviour; A Study on Association between the Variables of Investment Behaviour and Investors Attitude. International Journal of Economic Perspectives, 99 – 117, 16 (2)

Stambaugh, R. F. and Yuan, Y. (2017) Mispricing Factors. The Review of Financial Studies, 1270–1315, 30 (4)

Stanley, M. K. (2013) Why millennials matter. National Underwriter/ Life & Health Financial Services, 36 – 40, 117 (8)

Stolper, O. A. and Walter, A. (2017) Financial literacy, financial advice, and financial behavior. Journal of Business Economics, 581 – 643, 87

Subash, R. (2012) Role of Behavioral Finance in Portfolio Investment Decisions: Evidence from India. Faculty of Social Science Institute of Economic Studies, 8–9

Sukumaran, S., Bee, T. S. and Wasiuzzaman, S. (2022) Cryptocurrency as an investment: the Malaysian context. Journal of Decision System

Sultana, S. and Pardhasaradhi, S. (2011) An empirical investigation of the relation between risk tolerance and socioeconomic characteristics of individual investors. Advances in management

Suman & Warne, D. P. (2012) Investment behavior of individual investor in stock market. International Journal of Research in Finance & Marketing, 2231–5985, 2

Sumiati, A., Widyastuti, U., Takidah, E., Suherman (2021) The millennials generation's intention to invest: a modified model of the theory of reasoned action. International Journal of Entrepreneurship, 1 – 11, 25 (3)

Sun, P. C., Tsai, R. J. and Finger, G. (2008) What drives a successful e-learning? An empirical investigation of the critical factors influencing learning satisfaction. Computers & Education, 1183 – 1202, 50 (4)

Tahang, M., and Sukardi, S. (2023) The Effect of Financial Management and Sales Stability on Business Survival in Companies Experiencing Financial Crisis. Journal of Creative Management and Innovation, 1(3)

Taherdoost, H. (2016) Validity and Reliability of the Research Instrument; How to Test the Validation of a Questionnaire/Survey in a Research. International Journal of Academic Research in Management, 28-36, 5

Taherdoost, H. (2019) What Is the Best Response Scale for Survey and Questionnaire Design; Review of Different Lengths of Rating Scale, Attitude Scale, Likert Scale. International Journal of Academic Research in Management

Tangwattanarat, N. (2017) A study of the perception of Thai cryptocurrency investors towards digital currency market. Thammasat University

Taylor, R. N. and Dunnette, M. D. (1974) Relative contribution of decision-maker attributes to decision processes. Organizational Behavior and Human Performance, 286 – 298, 12

Taylor, S. and Todd, P. A. (1995) Understanding information technology usage: a test of competing models. Information Systems Research, 144 – 176, 6 (2)

Teo, T. (2008) Pre-service teachers' attitudes towards computer use: A Singapore survey. Australasian Journal of Educational Technology, 413 – 424, 24

Teo, T. (2012) Examining the intention to use technology among pre-service teachers: an integration of the Technology Acceptance Model and Theory of Planned Bahavior. Taylor & Francis online, 3 – 18, 20 (1)

Teo, T. and Noyes, J. (2011) An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: A structural equation modelling approach. Computers & Education, 57 (2)

Thulasipriya, B. (2015) A study on the investment preferences of government employees on various investment avenues. International Journal of Management research and social sciences, 9-16, 2 (1)

Tigges, P., Riegert, A., Jonitz, L., Brengelmann, J. (2000) Risk behavior of East and West Germans in handling personal finance. Journal of Behavior Finance, 127 – 134, 1 (2)

Tikhomirov, S. (2018) Ethereum: State of knowledge and research perspectives. In: Imine, A., Fernandez, J., Marion, JY., Logrippo, L., Garcia-Alfaro, J. (eds) Foundations and Practice of Security, Lecture Notes in Computer Science. Springer International Publishing, 10723

Trang, P. T. M. and Tho, N. H. (2017) Perceived risk, investment performance and intentions in Emerging Stock Markets. International Journal of Economics and Financial Issues, 269 – 278, 7 (1)

Trautman, L. (2014) Virtual Currencies Bitcoin & What Now After Liberty Reserve, Silk Road, and Mt. Gox? Richmond Journal of Law and Technology 13, 20 (4)

Trinh, K. and Cameron, A. L. (2017) Four factors driving the price of bitcoin. The Conversation

Twenge, J. M. (2013) The Evidence for Generation Me against Generation We. Emerging Adulthood. Society for the Study of Emerging Adulthood and SAGE Publications, 11-16, 1 (1)

Twenge, J. M. and Campbell, S. M. (2008) Generational differences in psychological traits and their impact on the workplace. Journal of Managerial Psychology, 862–877, 23 (8)

Twenge, J. M., Campbell, S. M., Lance, C. E. and Hoffman, B. J. (2010) Generational Differences in Work Values: Leisure and Extrinsic Values Increasing, Social and Intrinsic Values Decreasing. Journal of Management, 36 (5)

Twenge, J. M., Campbell, W. K. and Freeman, E. C. (2012) Generational differences in young adults' life goals, concern for others, and civic orientation. Journal of Personality and Social Psychology, 1045–1062, 102 (5)

Ul-Hameed, W., Imran, M., Maqbool, N., Ahmed, S. and Azeem, M. (2019) A prospective study of factors that lead to invest in mutual funds: A mediating role of investor’s perception. Accounting, 69 –80, 5

Ungeheuer, M. and Weber, M. (2020) The perception of dependence, investment decisions, and stock prices. Journal of Finance, Forthcoming

Usriyono, E. and Wahyudi, S. (2023) The investment decision of millennial generation: an analysis using financial literacy and financial behavior. Corporate Governance and Organizational Behavior Review, 8 – 14, 7 (2)

Valentine, D. B. and Powers, T. L. (2013) Generation Y values and lifestyle segments. Journal of Consumer Marketing, 597–606, 30 (7)

Van Blommestein, K. and Daim, T. (2013) Residential energy efficient device adoption in South Africa. Sustainable Energy Technologies and Assessments, 13 – 27, 1

Van Hout, M. C. and Bingham, T. (2013) Surfing the Silk Road: a study of users' experiences. Int J Drug Policy, 24 (6)

Van Rooji, M. and Lusardi, A. (2011) Financial literacy and stock market participation. Journal of Financial Economics, 449 – 472, 101 (2)

Veerasingam, N. and Teoh, A. (2022) Modeling cryptocurrency investment decision: evidence from Islamic emerging market. Journal of Islamic Marketing, 1817-1835, 14 (7)

Venkatesh, V. and Morris, M. G. (2000) Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. MIS Quarterly, Management Information Systems Research Center, University of Minnesota, 115 – 139, 24 (1)

Venkatesh, V., Morris, M. G., Davis, G. B., and Davis F. D. (2003). User acceptance of information technology: Toward a Unified View. MIS Quarterly, 425-478, 27

Venkatesh, V., Thong, J. Y. L. and Xu, X. (2012) Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. MIS Quarterly, 157 – 178, 36 (1)

Verplanken, B. and Aarts, H. (1999) Habit, Attitude, and Planned Behavior: Is habit an empty construct or an interesting case of goal-directed automaticity? European review of social psychology, 101 – 134, 10

Vuk, K., Pifar, A. and Aleksic, D. (2017) Should I, Would I, Could I: Trust and risk influences on intention to invest. Dynamic Relationships Management Journal, 61 – 67, 6 (1)

Wada, T., Sano, H., Holmes, S. (2017) Japan's FSA approves 11 companies as operators of crypto-currency exchanges. Reuters. Available at: https://www.reuters.com/article/japan-bitcoin-idUSL4N1MA20Q/ (10th November 2021)

Wahyuni, D. (2012) The research design maze: Understanding paradigms, cases, methods and methodologies

Walther, T., Klein, T. and Bouri, E. (2019) Exogenous drivers of bitcoin and cryptocurrency volatility – a mixed data sampling approach to forecasting. Journal of International Financial Markets, Institutions and Money, 101 – 133, 63

Walton, A. and Johnston, K. (2018) Exploring perceptions of bitcoin adoption: the South African virtual community perspective. Interdisciplinary Journal of Information, Knowledge and Management, 165 – 182, 13

Wang, Y. S., Wang, Y. M., Lin, H. H. and Tang, T. I. (2003) Determinants of user acceptance of internet banking: an empirical study. International Journal of Service Industry Management, 501 – 519, 14

Wärneryd, K. (2001) Stock-market Psychology, How People Value and Trade Stocks. Edward Elgar

Wärneryd, K. E. (1996) Risk attitudes and risky behavior. Journal of Economic Psychology, 749 – 770, 17 (6)

Weber, E. U., Blais, A. R. and Betz, N. E. (2002) A domain-specific risk-attitude scale: measuring risk perceptions and risk behaviors. Journal of Behavioral Decision Making, 263 – 290, 15 (4)

Wei, W. C. (2018) The impact of Tether grants on Bitcoin. Economics Letters, Elsevier, 19 – 22, 171

Weigel, F. K., Hazen, B. T., Cegielski, C. G. and Hall, D. J. (2014) Diffusion of Innovations and the Theory of Planned Behavior in Information Systems Research: A Meta anlysis. Communications of the Association for Information Systems, 34

Westerman, J., Bergman, J., Bergman, S. and Daly, J. (2011) Are Universities creating millennial Narcissistic Employees? An empirical examination of narcissism in business students and its implications. Journal of Management Education, 5 – 32, 36 (1)

Wicker, A. W. (1969) Attitudes versus Actions: The relationship of verbal and overt behavioral responses to attitude objects. Journal of Social Issues, 41 – 78, 25 (4)

Wiedmann, K. P., Hennigs, N., Behrens, S. and Klarmann, C. (2013) Unleashing the power of luxury: Antecedents of luxury brand perception and effects on luxury brand strength. Journal of Brand Management, 20 (8)

Wiseman, S. A. (2016) Property or Currency? The tax dilemma behind bitcoin. Utah Law Review, 2 (5)

Wood, R. and Zaichkowsky, J. L. (2004) Attitudes and trading behavior of stock market investors: A segmentation approach. Journal of Behavioral Finance, 170 – 179, 5 (3)

Wu, I. L. and Chen, J. L. (2005) An extension of trust and TAM model with TPB in the initial adoption of online tax: An empirical study. International Journal of Human-Computer Studies, 62

Xi, D., O'Brien, T. I. and Irannezhad, E. (2020) Investigating the investment behaviors in cryptocurrency. The Journal of Alternative Investments, 141 – 160, 23 (2)

Xiao, J. J. (2008) Applying behavior theories to financial behavior. Handbook of consumer finance research. New York: Springer, 69 – 82

Xiao, J. J., Ford, M. W. and Kim, J. (2011) Consumer Financial Behavior: An interdisciplinary review of selected theories and research. Family and Consumer Sciences Research Journal, 399 – 414, 39 (4)

Yanardağ, N. (2019) Cryptocurrency Investment Decisions and Behavioral Bias Effect. Cryptocurrency Investment Decisions and Behavioral Bias Effect. Istanbul Bilgi University

Yang, H., Lee, H. and Zo, H. (2017) User acceptance of smart home services: An extension of the theory of planned behavior. Industrial Management & Data Systems, 68 – 89, 117

Yankelovich, S. and White, I. (1984) Taxpaper attitudes survey: final report. Public Opinion Survey prepared for the Public Affairs Division, Internal Revenue Service by Yankelovich and White, New York, NY

Yaser, B. A. (2020) Cryptocurrency market: behavioral finance perspective. Journal of Asian Finance, Economics and Business, 159 – 168, 7 (12)

Yelowitz, A. and Wilson, M. (2015) Characteristics of Bitcoin users: an analysis of Google search data. Applied Economics Letters,1030-1036, 22 (13)

Yilmaz, N. K. and Hazar, H. (2018) Determining the factors affecting investors' decision-making process in cryptocurrency investments. Press Academia Procedia (PAP), 5-8, 8

Yin, R. K. (2013) Case Study Research: Design and Methods. SAGE Publications

Yin, R. K. (2018). Case Study Research and Applications: Design and Methods. 6th Edition, SAGE Publications

Yoo, K., Bae, K., Park, E. and Yang, T. (2020) Understanding the diffusion and adoption of Bitcoin transaction services: The integrated approach. Telematics and Informatics, 101 – 302, 53

Zetzsche, D. A., Buckley, R. P., Arner, D. W. and Barberis, J. N. (2019) From Fintech to Techfin: The regulatory challenges of data-driven finance. New York University Journal of Law and Business, Forthcoming, European Banking Institute, 6

Zhang, J. (2019) Initial Coin Offerings: The role of subjective information in Whitepapers. OhioLINK Electronic Theses and Dissertations Center

Zhang, S., Xuanyu, Z., Pan, H. and Jia, J. (2019) Cryptocurrency, confirmatory bias and news readability – evidence from the largest Chinese cryptocurrency exchange. Accounting and Finance, 58 (5)

Zhao, J. (2014) Applying grounded theory methodology with mixed methods in occupant energy behaviour research. The International Academic Forum, Brighton

# APPENDIX

## APPENDIX A.1: PRE-INTERVIEW SURVEY

Dear participant,

I am Chi Nguyen and I am collecting data from you which will be used in my DBA research with the University of Wales Trinity Saint David.

The objective of the research is to examine how millennial investors perceive cryptocurrency as an investment method and to understand the impact of attitude on behaviour in cryptocurrency investment.

The data you provide will only be used for this thesis and will not be disclosed to any third party. This research has been reviewed and approved by the University of Wales Trinity Saint David. If you have further questions or concerns about this study, please contact:

Name of the research: Chi Nguyen - Email: 1813539@student.uwtsd.ac.uk

**Screening question**

1. Do you belong to the group of people who is from 25 to 41 years old?

| | |
|---|---|
| Yes | |
| No | |

2. Have you ever invested in cryptocurrency?

| | |
|---|---|
| Yes | |
| No | |

3. Have you ever invested in Bitcoin?

| | |
|---|---|
| Yes | |
| No | |

4. Please choose the factor has the most influential impact on your cryptocurrency investment

| | |
|---|---|
| Economic factor (e.g. high returns/diversified portfolios) | |
| Technological factor (e.g. interest in Defi/Blockchain/NFT, and so on) | |
| Social factor (e.g. friends/ social media) | |
| Government factor (e.g. tax benefits) | |

**Your contact details**

5. What is your initial?

6. What is your email address?

7. Please confirm your most preference method of contact

| | |
|---|---|
| Zoom | |
| Google meet | |
| Whatsapp | |
| Other | |

8. If Other, please specify

9. Please confirm your availability, I will send you an email to re-confirm the time and date. Thanks!

## APPENDIX A.2: INTERVIEW QUESTIONS

1. How long have you been invested in cryptocurrency? What was your motivation to invest in cryptocurrency?
2. Which are the particular tools or platforms that you use to invest in cryptocurrency market?
3. Do you have any plans for your cryptocurrency investment? What is your main purpose of using cryptocurrency?
4. Do you perceive cryptocurrency as an investment opportunity?
5. Did you invest in cryptocurrency market because you expect to earn high returns?
6. As cryptocurrency market is volatile, would the price movement affect you? If yes, how did it affect you?
7. Comparing to traditional banking, cryptocurrency has low admin fees. Does this factor affect your perception and decision in cryptocurrency investment?
8. Cryptocurrency does not charge any fees related to international transfer; do you perceive it as an usefulness when investing in cryptocurrency?
9. One of the Blockchain feature is you can have free access to the public ledger. Is this something you concern the most when investing?
10. Cryptocurrency is decentralized, which means no central authority could take control of your activity or status. Is this something you concern the most when investing?
11. Is being able to hide your identity the reason you want to invest in cryptocurrency?
12. Do you trust the security of cryptocurrency system?
13. It is claimed that cryptocurrency is secure as it is decentralized. However, are you afraid of hackers?
14. Do you take advice from friends and family?
15. Are you following any forums or social media platforms that related to cryptocurrency? If yes, how do you usually interact on those platforms?
16. Are you being influenced by the news when it comes to cryptocurrency investment?
17. Do you refer to project information on whitepaper?
18. Are you fully aware of the regulations in the country that you are currently investing? Are you willing to pay tax for your cryptocurrency investment? Does the permission to trade affect you?
19. Do you refer to political risks when investing in cryptocurrency?

## APPENDIX A.3: INTERVIEW TRANSCRIPT SAMPLE

### Transcript of interview: Respondent A – SAMPLE

**Question:** Did you invest in cryptocurrency market because you expect to earn high returns?

**Answer:** Yes. When it comes to investing, I always want to get returns. But cryptocurrency is a new type of assets in my opinion. It is hard to understand. It has no intrinsic value, but until this year when I observed cryptocurrency prices continue to go up, I feel like may I was wrong. Maybe I was close-minded, I should be more open-minded. When you see an asset that booms and hops several times in quite short history, you have some kind of curiosity about that.

**Question:** As cryptocurrency market is volatile, would the price movement affect you? If yes, how did it affect you?

**Answer:** I noticed I had changed my strategy several times at first. When I first bought it at a price about 3000, and I continued to buy up and the market collapsed to 1600. Then, I changed my strategy and now I stick to DCF. With that, my monthly purchase is around 2000 or something. I do not trade daily. I mean if something has a future value ahead then I want to be a part of that, I do not know how close it is, or maybe it is just backed by the history of investment.

## APPENDIX B: QUESTIONNAIRES

Dear participant,

I am Chi Nguyen and I am collecting data from you which will be used in my DBA research with the University of Wales Trinity Saint David.

The objective of the research is to examine how millennial investors perceive cryptocurrency as an investment method and to understand the impact of attitude on behaviour in cryptocurrency investment.

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Name of the research: Chi Nguyen - Email: 1813539@student.uwtsd.ac.uk

### Screening questions

1. Do you belong to the group of people who is from 25 to 41 years old?

| | |
|---|---|
| Yes | |
| No | |

2. Have you ever invested in cryptocurrency?

| | |
|---|---|
| Yes | |
| No | |

### Demographic questions

3. What is your gender?

| | |
|---|---|
| Woman | |
| Man | |
| Non-binary | |
| Prefer not to say | |

4. What is your highest level of education?

| | |
|---|---|
| High school degree or equivalent | |
| Bachelor | |
| Master | |
| PhD, Doctorate or equivalent | |

5. Please choose the categories that best describe your employment status:

| | |
|---|---|
| Full-time employment (including self-employment) | |
| Part-time employment (including self-employment) | |
| None of the above | |

6. Please indicate which field are you currently in? (e.g. finance/art/healthcare/etc.)

**Questions related to your investing experience**

7. What is your purpose for investing in cryptocurrency?

| | |
|---|---|
| To earn extra income | |
| To look for alternative savings method | |
| To make regular international money transfer | |
| To understand more about blockchain/cryptocurrency technology | |
| Other | |

8. If Other, please specify. Thank you!

9. How often do you trade with cryptocurrency?

| | |
|---|---|
| Daily | |
| Weekly | |
| Monthly | |
| Seasonal | |
| Yearly | |
| Never | |

10. Would you consider cryptocurrency as a short-term or long-term investment?

    (Short-term investment is less than 6 months; Long-term investment is more than 6 months; up to 3 years.)

| | |
|---|---|
| Short-term investment | |
| Long-term investment | |

11. Are you currently investing in other markets? (i.e. stock market, mutual funds, FX, real estate, etc.)

| | |
|---|---|
| Yes | |
| No | |

12. Comparing to other markets, it is said that cryptocurrency is the riskiest investment. Do you agree with this statement?

    SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree

| **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|
| | | | | |

13. Please evaluate these statement

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I invest in cryptocurrency because I believe I could earn a lot of money | | | | | |
| I am influenced by the price movement | | | | | |
| I choose to hold when the market | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| performance is poor | | | | | |
| I forecast changes in cryptocurrency prices in the future based on past cryptocurrency prices | | | | | |
| When it comes to cryptocurrency investment, I tend to look for returns than losses | | | | | |

14. Please evaluate these statements

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| After a prior gain, I am more risk-seeking than before | | | | | |
| After a prior loss, I become more risk-averse than before | | | | | |
| I am affected by a substantial loss in my cryptocurrency investment | | | | | |
| After a prior loss,<br>I tend to avoid the same investment strategy | | | | | |

15. Please evaluate these statements

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I am willing to pay fees on a | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| cryptocurrency platform when investing | | | | | |
| Fees on cryptocurrency platform are cheaper than regular banking fees | | | | | |
| I prefer using cryptocurrency when transfering money internationally | | | | | |
| After a prior loss, I tend to avoid the same investment strategy | | | | | |

16. Please evaluate these statements.

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I value the transparency in cryptocurrency investment | | | | | |
| Cryptocurrency has no central authorities control, which means the government cannot control one's cryptocurrency investment. This is the reason why I invest in cryptocurrency | | | | | |
| I value the importance of freedom and open- source | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| cryptocurrency platform that allows investors freely access | | | | | |

17. Please evaluate these statements.

| Statement | SA | A | N | D | SD |
|---|---|---|---|---|---|
| I trust the security of Blockchain and cryptocurrency system | | | | | |
| I feel safe when investing/trading on cryptocurrency platform as it could not be hacked | | | | | |
| I feel safe when investing/trading on cryptocurrency platform as no one knows about my identity | | | | | |

**Questions related to your investing experience**

18. Please evaluate these statements.

| Statement | SA | A | N | D | SD |
|---|---|---|---|---|---|
| I invest in cryptocurrency because of my friends/family/colleague | | | | | |
| Other investors' decisions of choosing cryptocurrency coins have an impact on my investment decisions | | | | | |
| Other investors' decisions of the cryptocurrency volume have an impact on my investment decisions | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Other investors' decisions of buying and selling cryptocurrency have an impact on my investment decisions | | | | | |
| My forecast on the market is better than my friends/family/colleague's forecast | | | | | |

19. Please evaluate these statements.

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I tend to follow influencers' opinions on social media (Twitter/Telegram/Youtube) to invest in cryptocurrency | | | | | |
| Before making any investing decisions, I tend to look for people on social media that have the same decision to confirm my action | | | | | |
| I am more influenced by the people's meaningful stories and opinions about certain cryptocurrency project to invest | | | | | |
| I value the project information (i.e. whitepaper) behind the coins to invest | | | | | |

20. Please evaluate these statements.

**News related to macro-economic and other market**

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I am influenced by news when investing in cryptocurrency | | | | | |
| I believe in the information that I gained from the news can help me to outperform the market | | | | | |

21. Hypothetically, the government banned cryptocurrency investment, would you look for alternative investment methods?

| | |
|---|---|
| Yes | |
| No | |
| Maybe | |

22. Please evaluate these statements.

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| My investment decision is influenced by political risk (i.e. the government controls the system) | | | | | |
| My investment decision is influenced by tax benefits | | | | | |

**Final questions related to your investing experience.**

23. Please evaluate these statements.

| **Statement** | **SA** | **A** | **N** | **D** | **SD** |
|---|---|---|---|---|---|
| I believe cryptocurrency investment is a safe haven for me | | | | | |
| I invested in cryptocurrency because I see others can earn good amount of money from it | | | | | |
| I believe in my skills and knowledge of the cryptocurrency market that can help me to outperform the market | | | | | |
| I rely on my previous experiences in cryptocurrency market for my next investment | | | | | |

24. You have become less risk-averse over the period of investing in cryptocurrency market.

| | |
|---|---|
| True | |
| False | |

25. You realised that your attitude and perception about cryptocurrency has changed since the first time you invested in cryptocurrency.

| | |
|---|---|
| True | |
| False | |

## APPENDIX C: ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| DoIT | Diffusion of Innovation Theory |
| HDM | Hierarchical Decision Modeling |
| P2P | Peer to peer |
| PBC | Perceived behavioural controls |
| PLS | Partial Least Squares |
| PU | Perceived usefulness |
| SEM | Structural equation modelling |
| SN | Subjective norms |
| TAM | Technology Acceptance Model |
| TPB | Theory of Planned Behavior |
| TRA | Theory of Reasoned Action |
| UAE | United Arab Emirates |
| UK | United Kingdom |
| UTAUT1 | Unified Theory of Acceptance and Use of Technology 1 |
| UTAUT2 | Unified Theory of Acceptance and Use of Technology 1 |

## APPENDIX D: Figures

## Chapter 2: Literature review

| | # | Name | Price | 1h % | 24h % | 7d % | Market Cap | Volume(24h) | Circulating Supply |
|---|---|---|---|---|---|---|---|---|---|
| ☆ | 1 | Bitcoin BTC | $70,456.41 | 0.57% | 0.44% | 6.53% | $1,386,608,147,916 | $28,810,248,108<br>406,936 BTC | 19,680,368 BTC |
| ☆ | 2 | Ethereum ETH | $3,494.63 | 1.15% | 1.94% | 8.36% | $419,603,419,450 | $12,886,547,286<br>3,665,266 ETH | 120,070,963 ETH |
| ☆ | 3 | Tether USDT | $0.9997 | 0.02% | 0.03% | 0.07% | $107,270,374,808 | $55,217,731,265<br>55,233,996,539 USDT | 107,306,343,185 USDT |
| ☆ | 4 | BNB BNB | $617.13 | 0.67% | 3.01% | 7.23% | $92,282,210,578 | $1,644,696,242<br>2,655,150 BNB | 149,534,435 BNB |
| ☆ | 5 | Solana SOL | $170.40 | 1.31% | 1.04% | 0.79% | $75,992,376,157 | $2,467,656,102<br>14,422,376 SOL | 445,964,270 SOL |
| ☆ | 6 | XRP XRP | $0.6029 | 0.86% | 1.85% | 5.44% | $33,189,869,878 | $1,193,295,161<br>1,973,796,429 XRP | 55,051,549,471 XRP |

Figure 2.1. Top most traded cryptocurrency in Q1 2024 – Source: Coinmarketcap.com

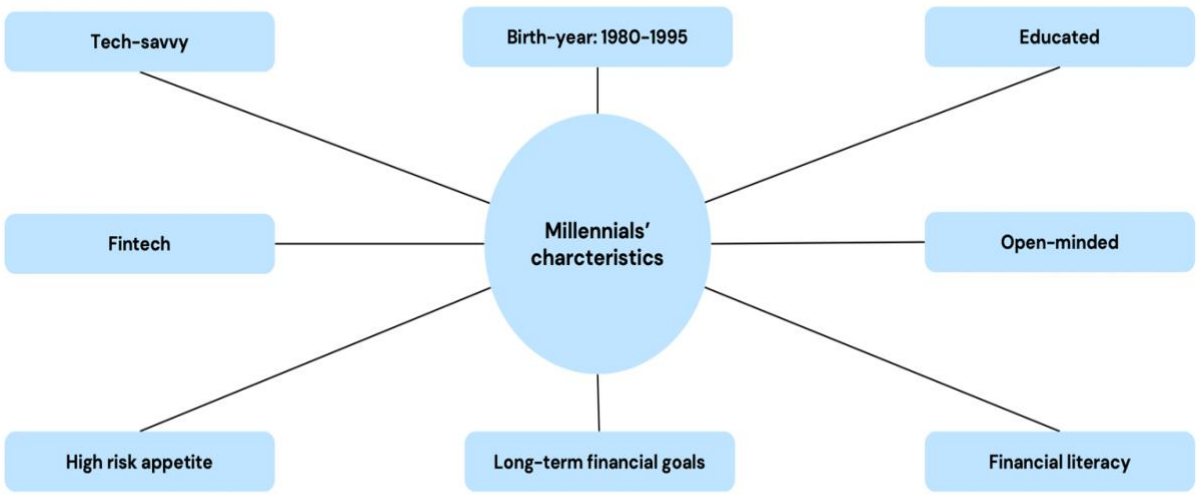


Figure 2.2. Millennials' characteristics – Source: from the research

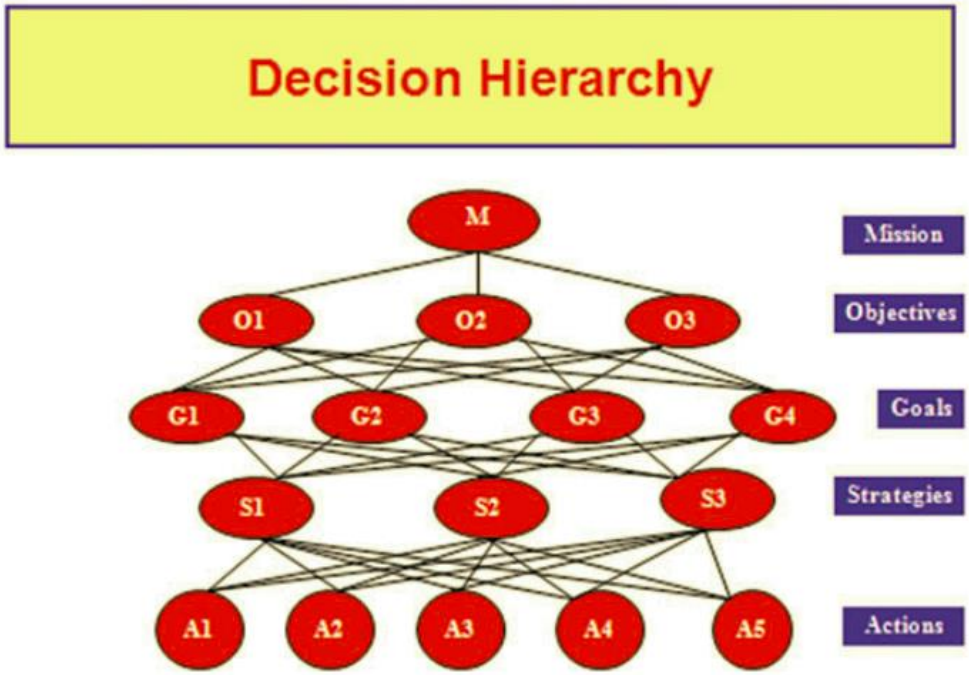


Figure 2.3. Hierarchical decision modeling (Daim, 2016)

## Chapter 3: Conceptual framework

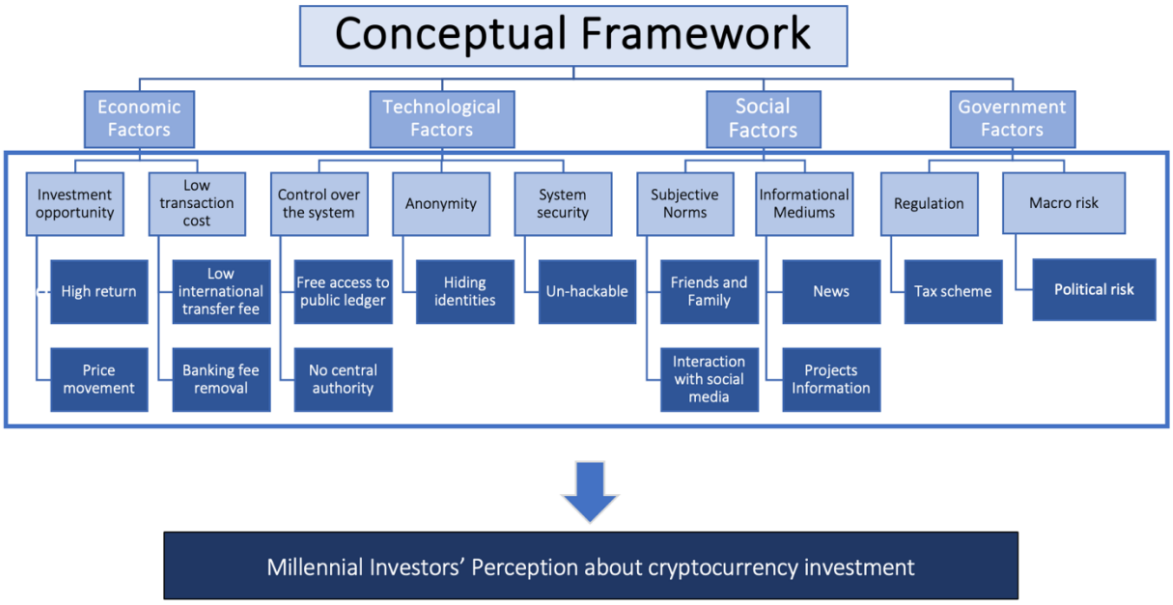


Figure 3.1. Conceptual framework – Source: from the research

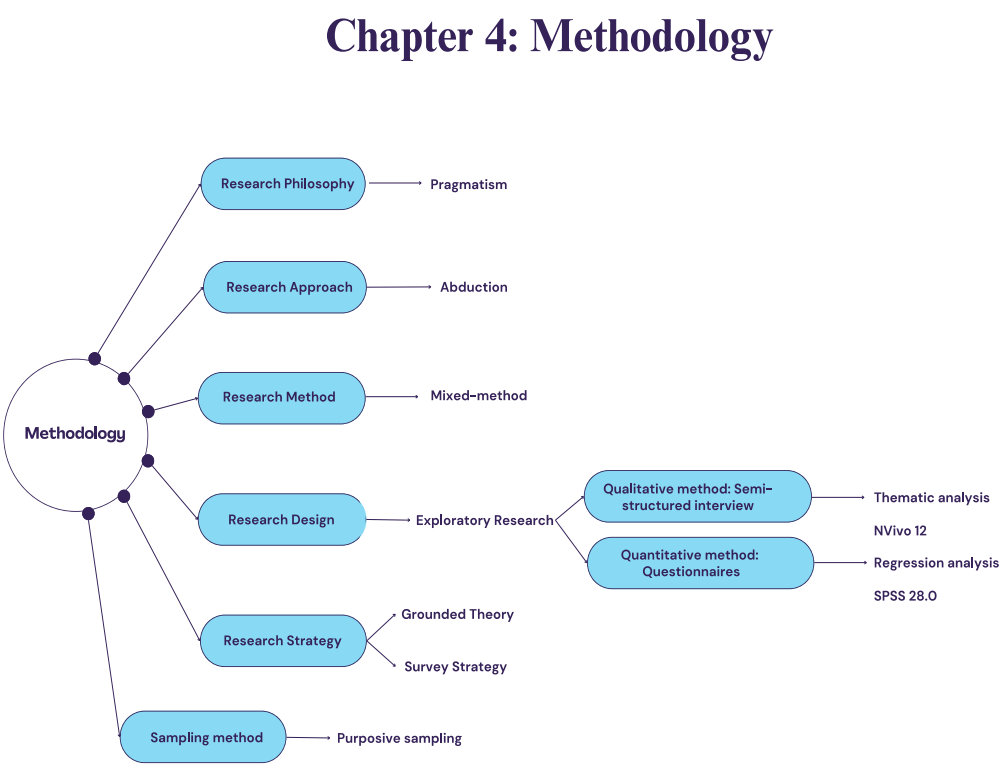


Figure 4.1. Research Methodology – Source: from the research

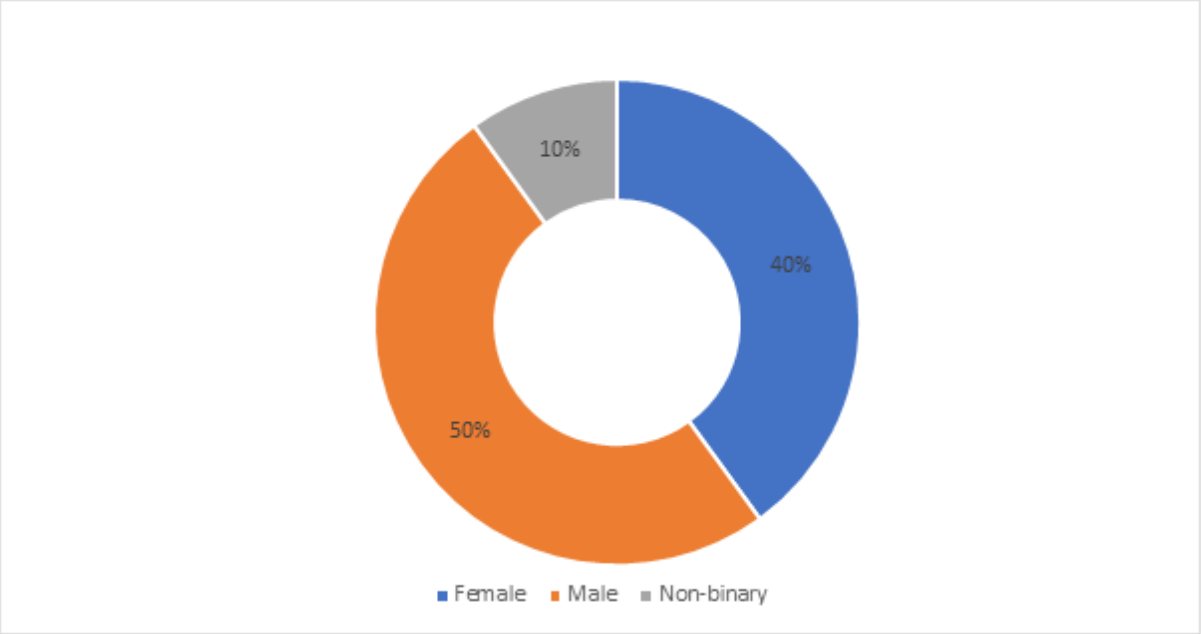


Figure 5.1. Demographic for phase one: gender – Source: from the research

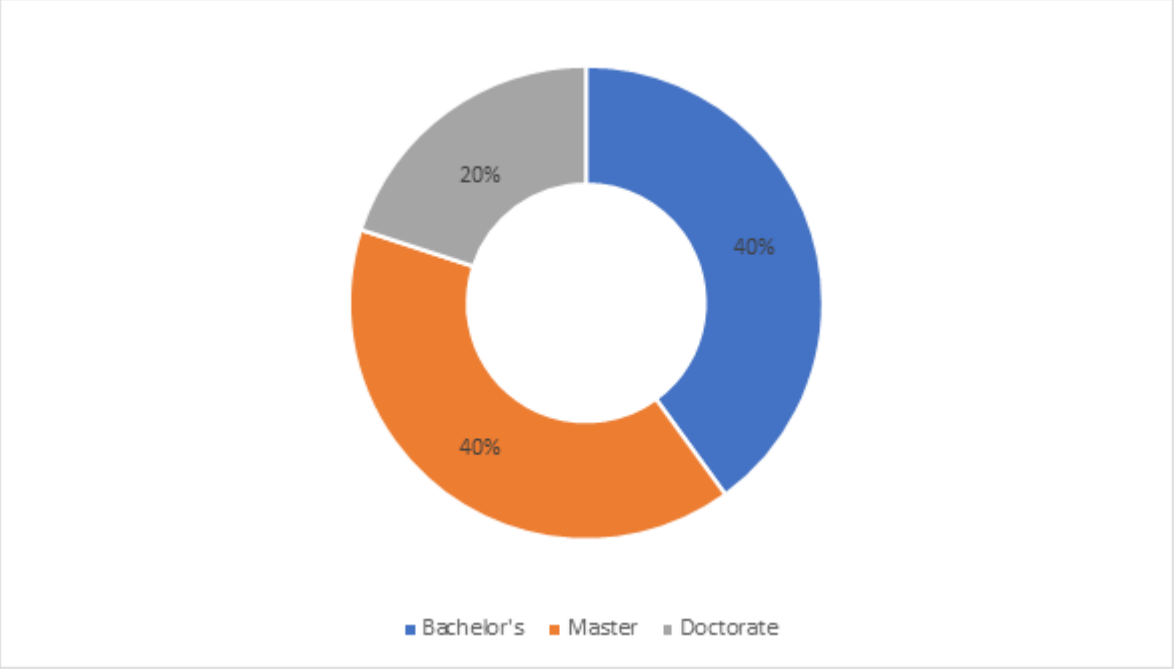


Figure 5.2. Demographic for phase one: education level – Source: from the research

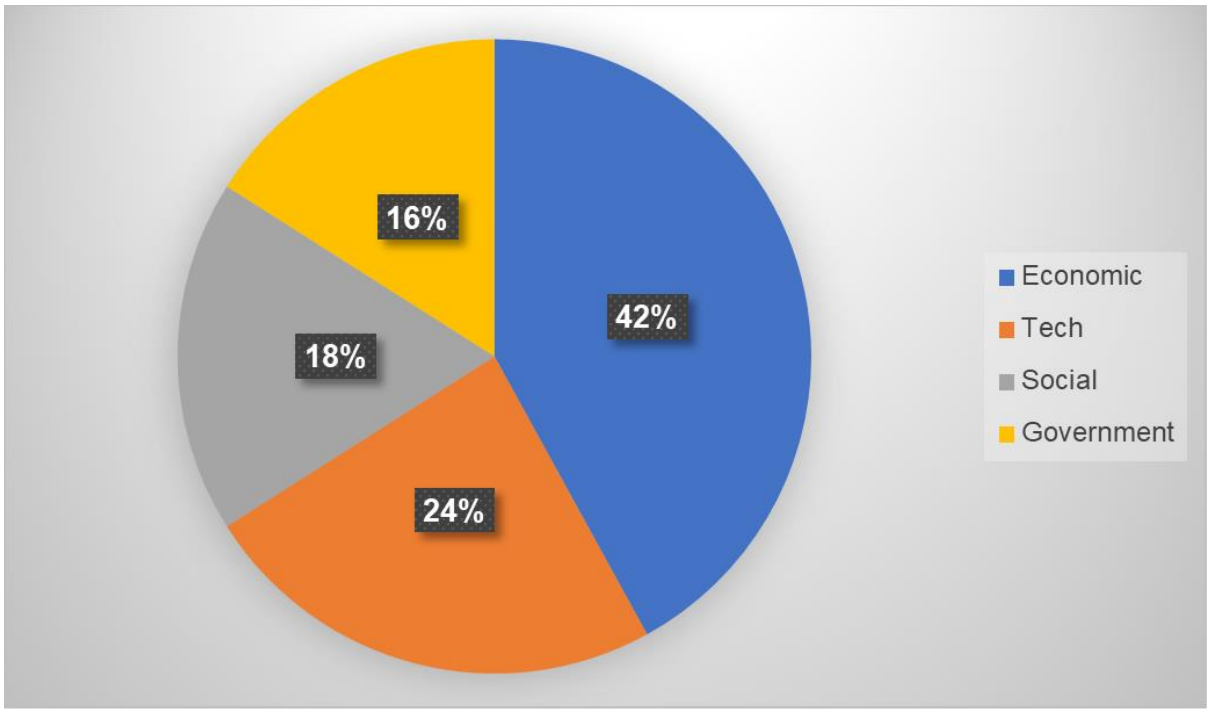


Figure 5.3. Factors impacting millennial investors' perception of cryptocurrency investment – Source: from the research

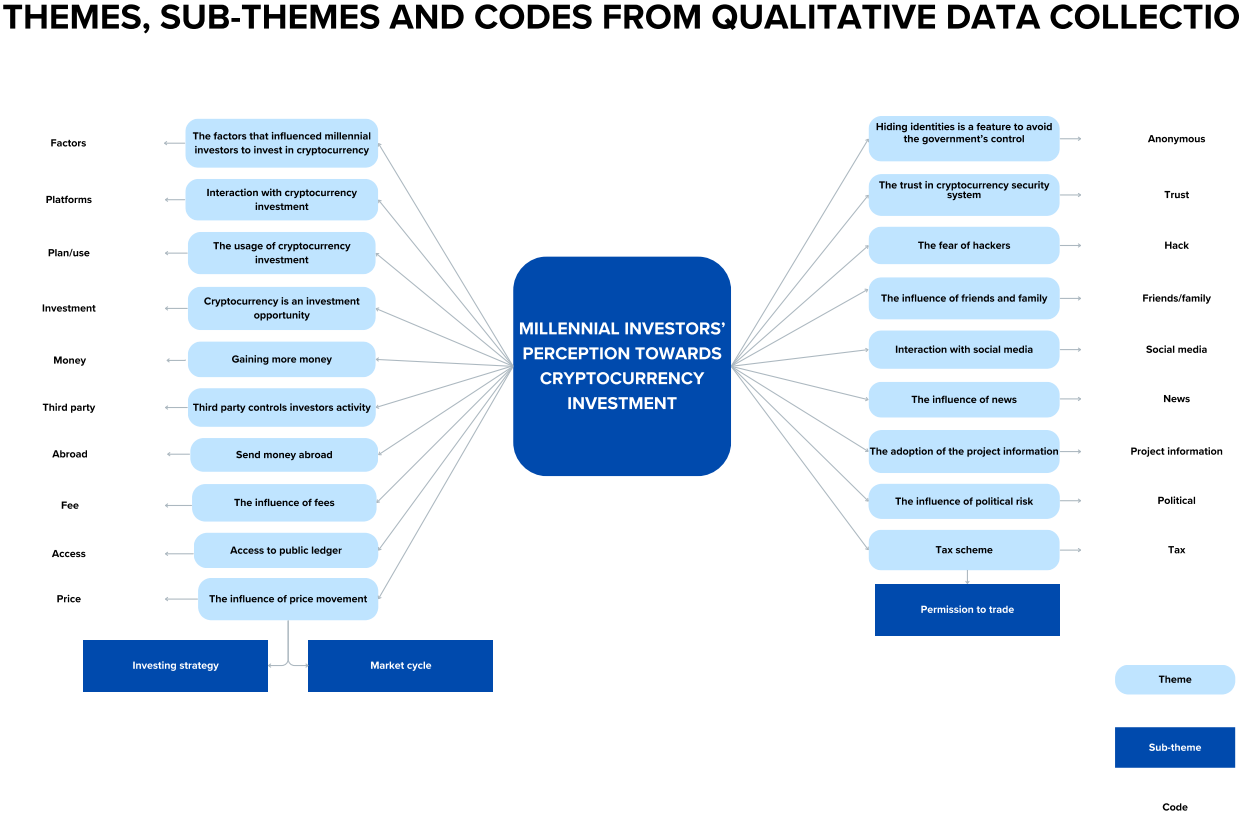


Figure 5.4. Themes, codes and coverage percentage in NVivo 12 – Source: from the research

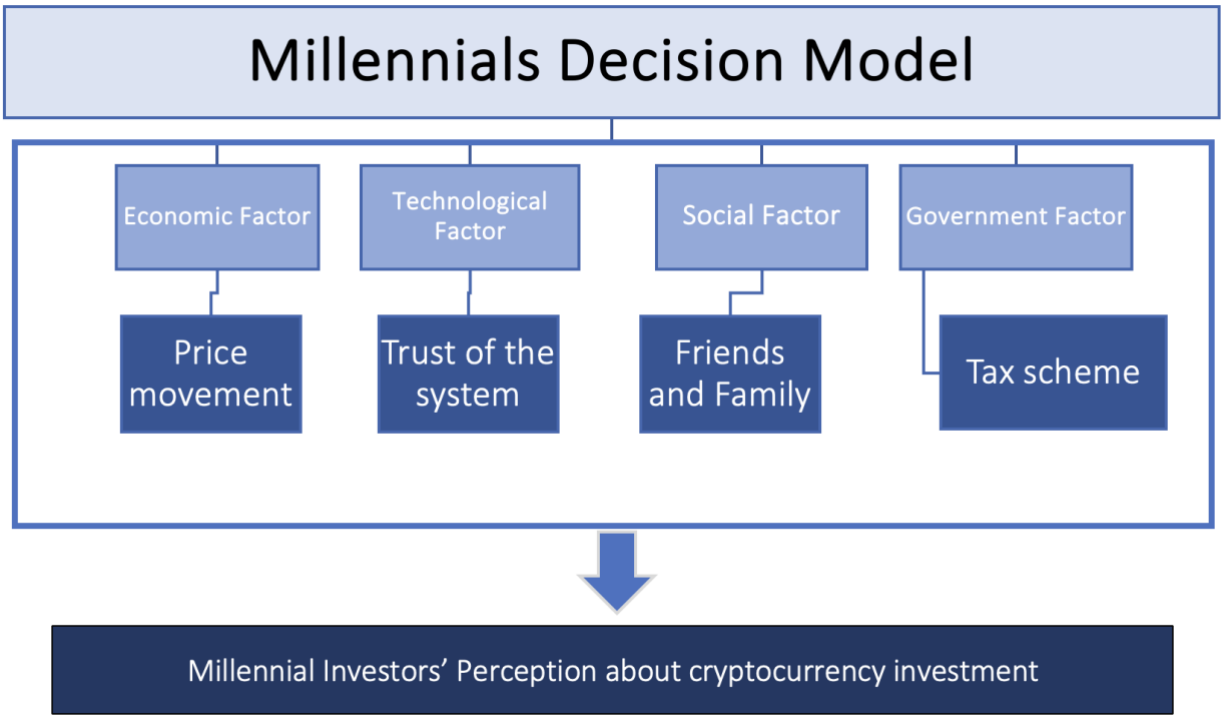


Figure 5.5. Millennials Decision Model - new model formed from qualitative analysis – Source: from the research

**Case Processing Summary**

| | | N | % |
|---|---|---|---|
| Cases | Valid | 93 | 100.0 |
| | Excluded[a] | 0 | 0 |
| | Total | 93 | 100.0 |

a. Listwise deletion based on all variables in the procedure.

Figure 6.2. Case Processing Summary – Source: from the research

**Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|---|---|---|
| .756 | .768 | 36 |

Figure 6.3. Reliability Statistics – Source: from the research

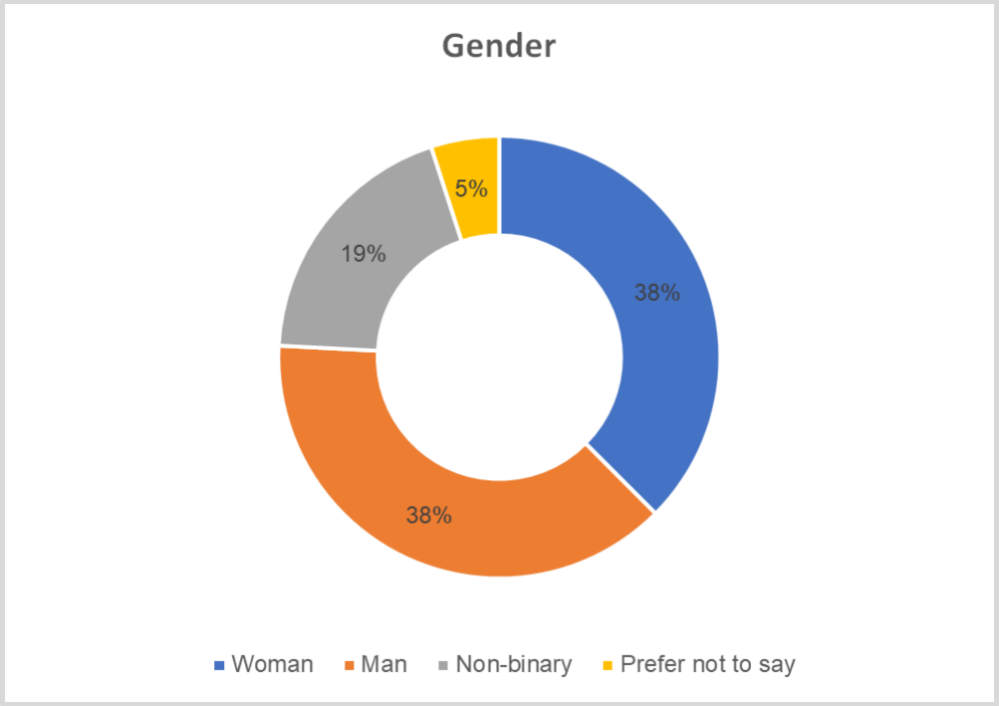


Figure 6.4. Demographics for phase two: gender – Source: from the research

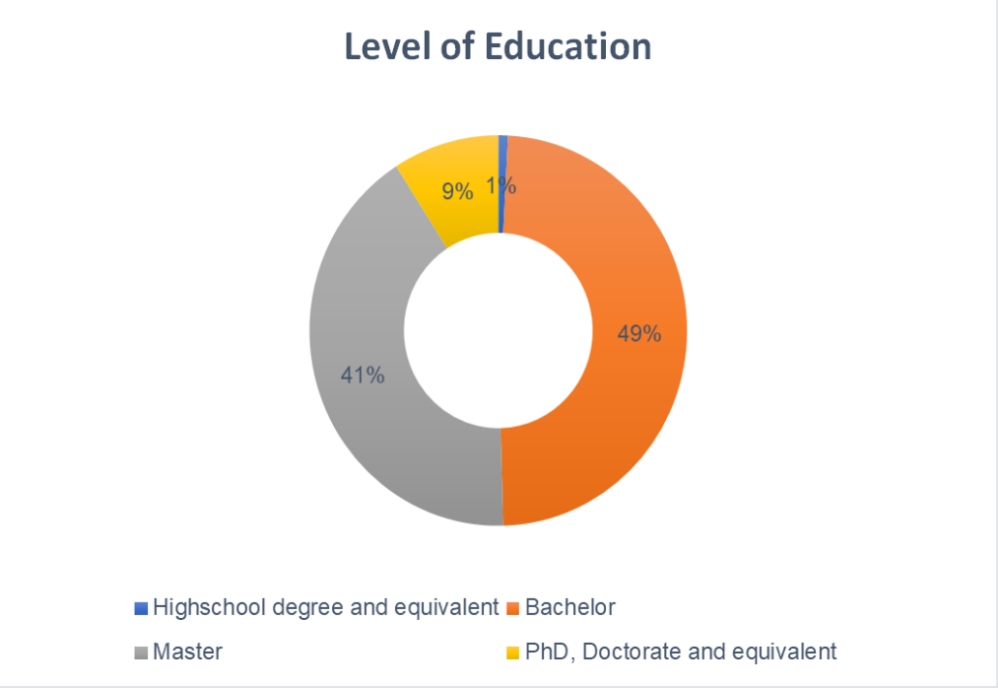


Figure 6.5. Demographic for phase two: level of education – Source: from the research

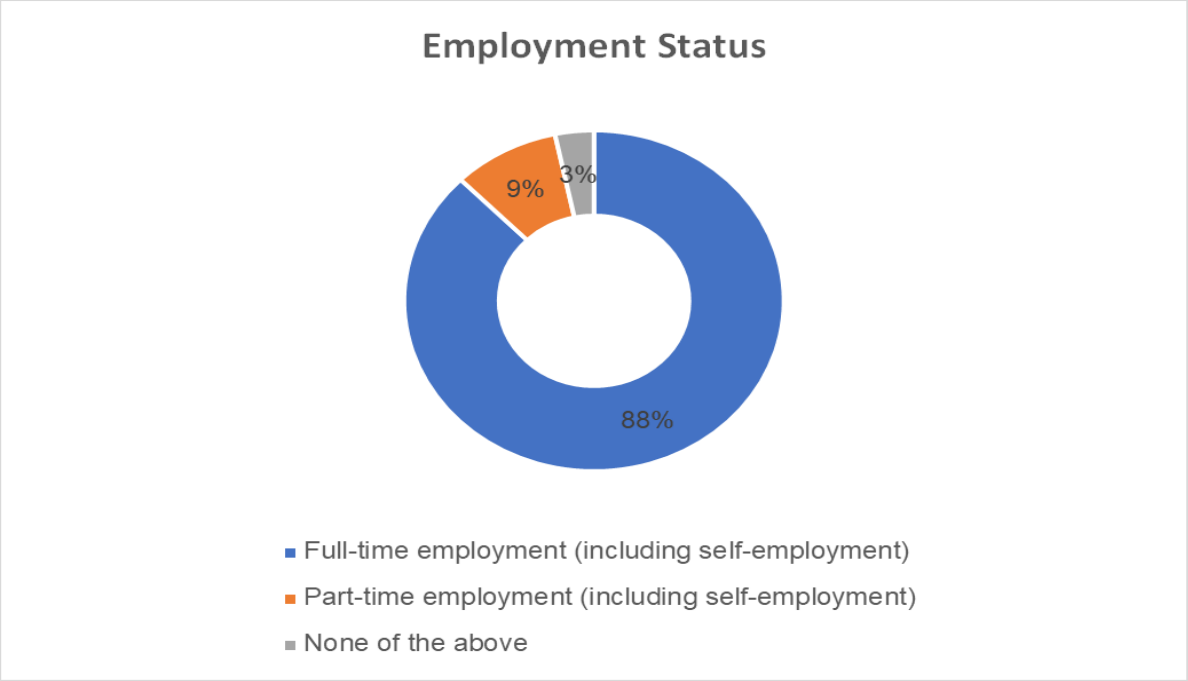


Figure 6.6. Demographics for phase two: employment status – Source: from the research

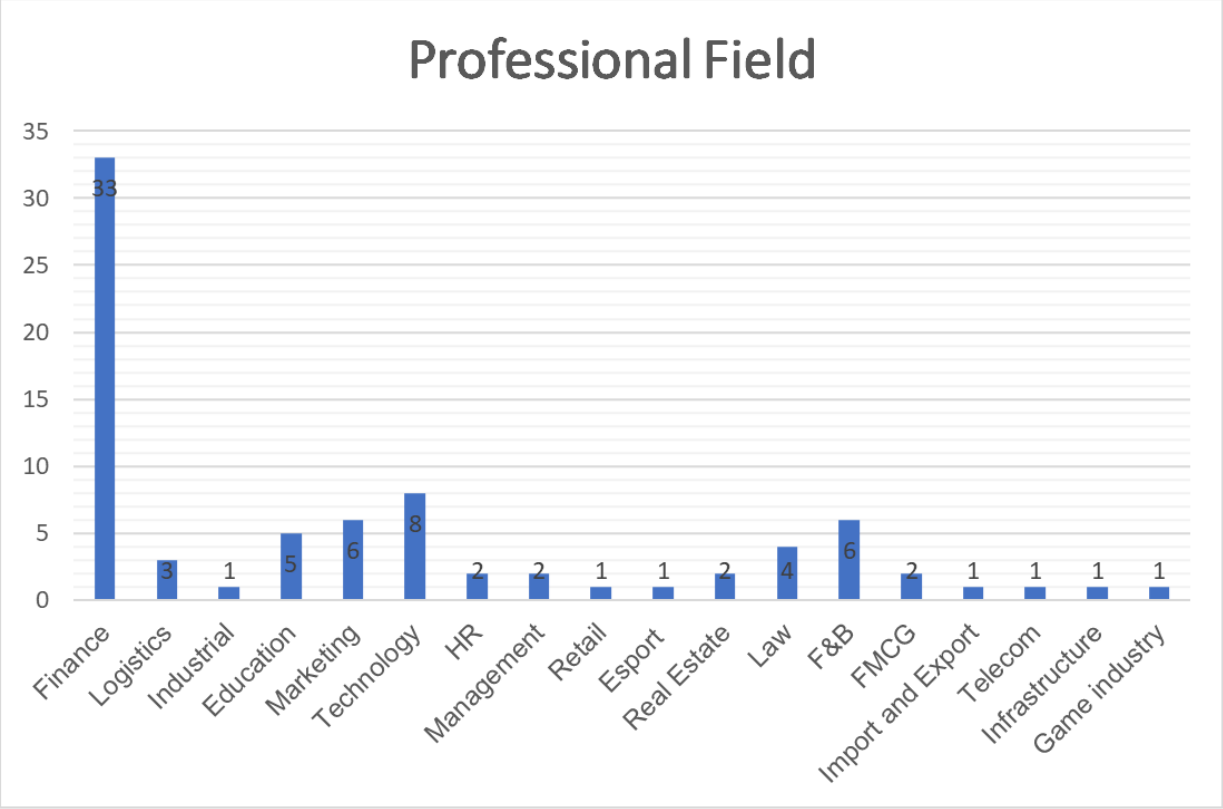

Figure 6.7. Participants' professional field – Source: from the research

**I am influenced by the price movement.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 19 | 20.4 | 20.4 | 20.4 |
| | 1 | 40 | 43.0 | 43.0 | 63.4 |
| | 2 | 25 | 26.9 | 26.9 | 90.3 |
| | 3 | 9 | 9.7 | 9.7 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.8 – Source: from the research

**I choose to hold when the market performance is poor.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 28 | 30.1 | 30.1 | 30.1 |
| | 1 | 45 | 48.4 | 48.4 | 78.5 |
| | 2 | 15 | 16.1 | 16.1 | 94.6 |

| | | | | | |
|---|---|---|---|---|---|
| | 3 | 4 | 4.3 | 4.3 | 98.9 |
| | 4 | 1 | 1.1 | 1.1 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.9 – Source: from the research

**I forecast changes in cryptocurrency prices in the future based on past cryptocurrency prices.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 24 | 25.8 | 25.8 | 25.8 |
| | 1 | 38 | 40.9 | 40.9 | 66.7 |
| | 2 | 24 | 25.8 | 25.8 | 92.5 |
| | 3 | 5 | 5.4 | 5.4 | 97.8 |
| | 4 | 2 | 2.2 | 2.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.10 – Source: from the research

**After a prior gain, I am more risk-seeking than before.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 26 | 28.0 | 28.0 | 28.0 |
| | 1 | 47 | 50.5 | 50.5 | 78.5 |
| | 2 | 15 | 16.1 | 16.1 | 94.6 |
| | 3 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.11 – Source: from the research

**After a prior loss, I become more risk-averse than before.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 25 | 26.9 | 26.9 | 26.9 |
| | 1 | 39 | 41.9 | 41.9 | 68.8 |
| | 2 | 20 | 21.5 | 21.5 | 90.3 |
| | 3 | 7 | 7.5 | 7.5 | 97.8 |

| | | | | | |
|---|---|---|---|---|---|
| | 4 | 2 | 2.2 | 2.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.12 – Source: from the research

**I am affected by a substantial loss in my cryptocurrency investment.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 31 | 33.3 | 33.3 | 33.3 |
| | 1 | 32 | 34.4 | 34.4 | 67.7 |
| | 2 | 21 | 22.6 | 22.6 | 90.3 |
| | 3 | 7 | 7.5 | 7.5 | 97.8 |
| | 4 | 2 | 2.2 | 2.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.13 – Source: from the research

**After a prior loss, I tend to avoid the same investing strategy.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 20 | 21.5 | 21.5 | 21.5 |
| | 1 | 34 | 36.6 | 36.6 | 58.1 |
| | 2 | 30 | 32.3 | 32.3 | 90.3 |
| | 3 | 8 | 8.6 | 8.6 | 98.9 |
| | 4 | 1 | 1.1 | 1.1 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.14 – Source: from the research

**I trust the security of Blockchain and cryptocurrency system.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 5 | 5.4 | 5.4 | 5.4 |
| | 1 | 20 | 21.5 | 21.5 | 26.9 |

| | | | | | |
|---|---|---|---|---|---|
| | 2 | 40 | 43.0 | 43.0 | 69.9 |
| | 3 | 22 | 23.7 | 23.7 | 93.5 |
| | 4 | 6 | 6.5 | 6.5 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.15 – Source: from the research

**I feel safe when investing/trading on cryptocurrency platform as it could not be hacked.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 3 | 3.2 | 3.2 | 3.2 |
| | 1 | 16 | 17.2 | 17.2 | 20.4 |
| | 2 | 37 | 39.8 | 39.8 | 60.2 |

| | | | | | |
|---|---|---|---|---|---|
| | 3 | 32 | 34.4 | 34.4 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.16 – Source: from the research

**I invest in cryptocurrency because of my friends/family/colleague.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 15 | 16.1 | 16.1 | 16.1 |
| | 1 | 46 | 49.5 | 49.5 | 65.6 |
| | 2 | 17 | 18.3 | 18.3 | 83.9 |
| | 3 | 10 | 10.8 | 10.8 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.17 – Source: from the research

**Other investors' decisions of choosing cryptocurrency coins have an impact on my investing decisions.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 7 | 7.5 | 7.5 | 7.5 |
| | 1 | 50 | 53.8 | 53.8 | 61.3 |
| | 2 | 26 | 28.0 | 28.0 | 89.2 |
| | 3 | 7 | 7.5 | 7.5 | 96.8 |
| | 4 | 3 | 3.2 | 3.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.18 – Source: from the research

**Other investors' decisions of the cryptocurrency volume have an impact on my investing decisions.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 8 | 8.6 | 8.6 | 8.6 |
| | 1 | 41 | 44.1 | 44.1 | 52.7 |

| | | | | | |
|---|---|---|---|---|---|
| | 2 | 31 | 33.3 | 33.3 | 86.0 |
| | 3 | 10 | 10.8 | 10.8 | 96.8 |
| | 4 | 3 | 3.2 | 3.2 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.19 – Source: from the research

**My investment decision is influenced by tax benefits.**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 0 | 29 | 31.2 | 31.2 | 31.2 |
| | 1 | 18 | 19.4 | 19.4 | 50.5 |
| | 2 | 34 | 36.6 | 36.6 | 87.1 |
| | 3 | 7 | 7.5 | 7.5 | 94.6 |
| | 4 | 5 | 5.4 | 5.4 | 100.0 |
| | Total | 93 | 100.0 | 100.0 | |

Figure 6.20 – Source: from the research

**Correlations**

| | | price_movement | trust_of_the_system | friends_and_family | tax_scheme | millennial investors' perception |
|---|---|---|---|---|---|---|
| price_movement | Pearson Correlation | 1 | .943** | .893** | .738** | .940** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| trust_of_the_system | Pearson Correlation | .943** | 1 | .865** | .781** | .790** |
| | Sig. (2-tailed) | .000 | | .000 | .000 | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| friends_and_family | Pearson Correlation | .893** | .865** | 1 | .728** | .739** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |

| | | | | | | |
|---|---|---|---|---|---|---|
| tax_scheme | Pearson Correlation | .738** | .781** | .728** | 1 | .734** |
| | Sig. (2-tailed) | .000 | .000 | .000 | | .000 |
| | N | 93 | 93 | 93 | 93 | 93 |
| millennial investors' perception | Pearson Correlation | .940** | .790** | .739** | .734** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 93 | 93 | 93 | 93 | 93 |

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 6.21 – Source: from the research

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 1 | .954[a] | .910 | .890 | .2654 |

a. Predictors: (Constant), tax_scheme, price_movement, trust_of_the_system, friends_and_family

b. Dependent Variable: millennial investors' perception

Figure 6.22 – Source: from the research

**ANOVA[a]**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 192.168 | 4 | 48.042 | 667.25 | .000[b] |
| | Residual | 6.336 | 88 | .072 | | |
| | Total | 198.504 | 92 | | | |

a. Dependent Variable: millennial investors' perception

b. Predictors: (Constant), tax_scheme, price_movement, trust_of_the_system, friends_and_family

Figure 6.23 – Source: from the research

**Coefficients[a]**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | 12.326 | 3.195 | | 3.860 | .000 |
| | price_movement | .390 | .075 | .370 | 5.253 | .000 |
| | trust_of_the_system | .153 | .147 | .088 | 1.037 | .000 |
| | friends_and_family | .335 | .073 | .347 | 4.607 | .000 |
| | tax_scheme | .050 | .062 | .054 | .801 | .010 |

a. Dependent Variable: millennial investors' perception

Figure 6.24 – Source: from the research

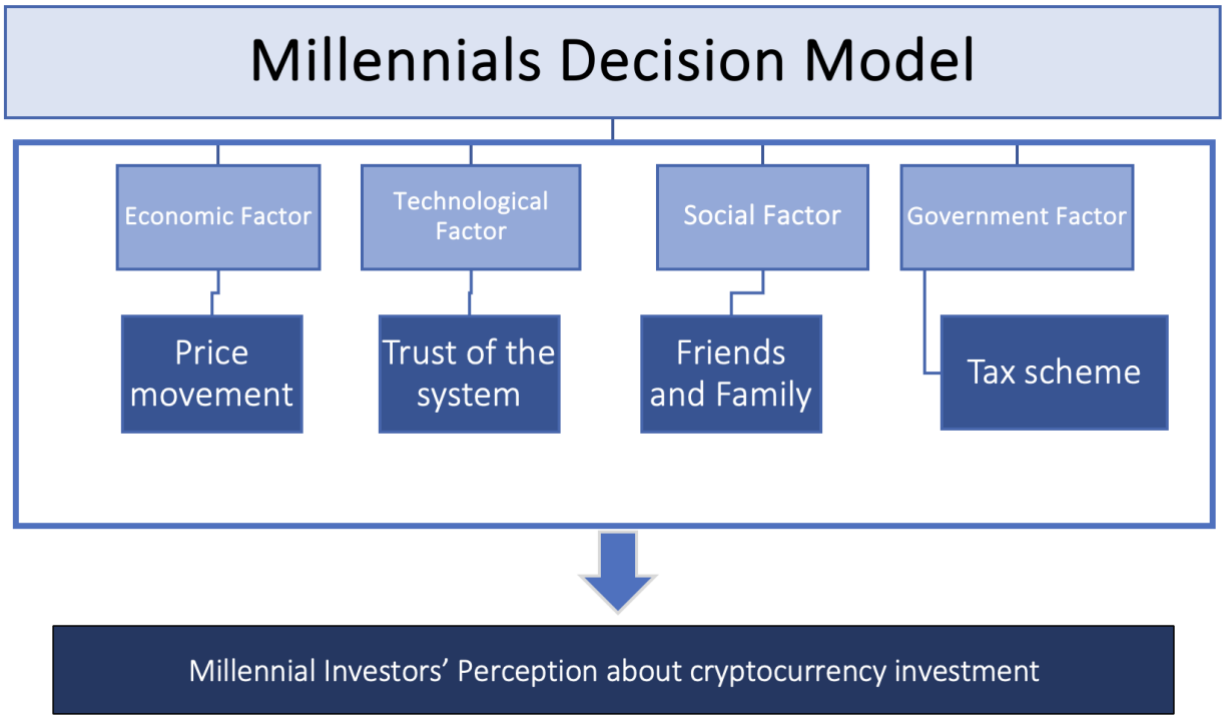


Figure 7.1 – Millennials Decision Model - Source: from the research

## Chapter 8: Conclusion

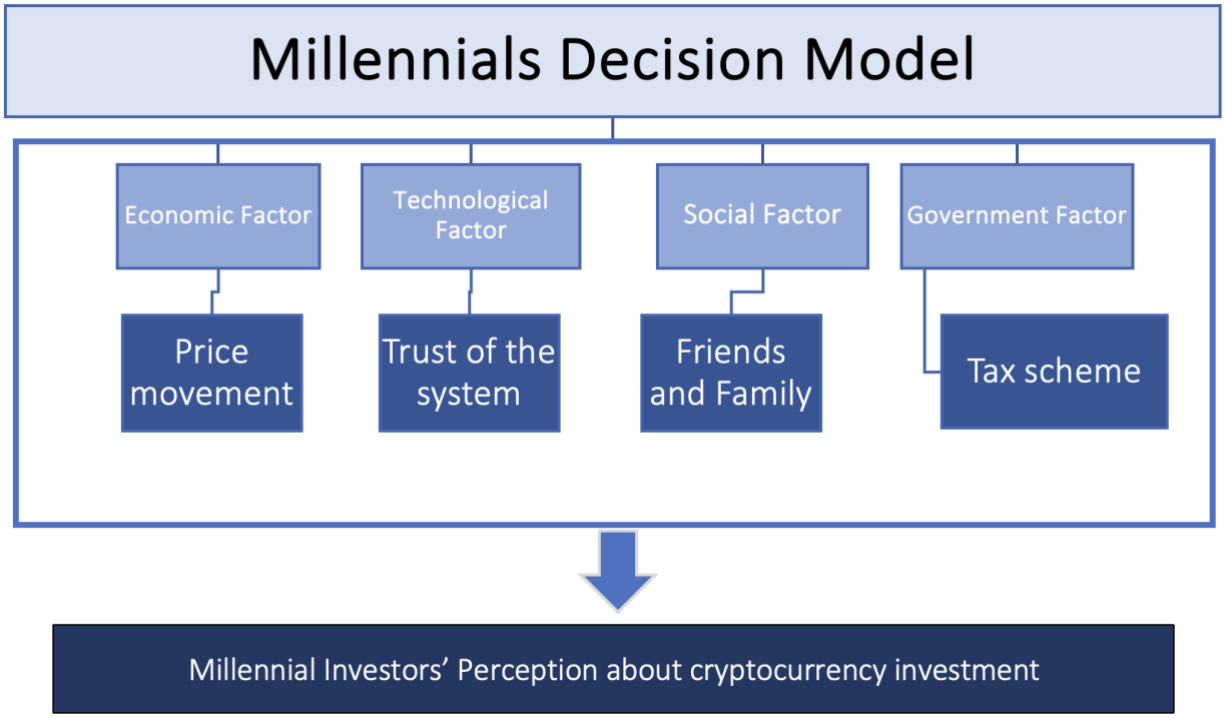


Figure 8.1 – Millennials Decision Model - Source: from the research

## APPENDIX E: TABLES

### Chapter 4: Methodology

| Philosophy | Ontology | Epistemology | Axiology |
|---|---|---|---|
| Positivism | - Facts are acquired rather than impressions to serve as the basis for further hypothesis testing.<br>- There is a single reality | - Uncovering observable and quantifiable facts are prioritised<br>- Causal links are established to generate law-like generalisations (Gill and Johnson, 2010) | - An objective and detached relationship with the research and data in order to prevent biassing the study's conclusions (Saunders et al., 2016).<br>- Value-free research should be considered |
| Critical realism | - Reality is viewed as external and autonomous, yet inaccessible directly through observation and knowledge.<br>(Saunders et al., 2016; Fleetwood, 2005) | - Critical realists support epistemic relativism as part of their focus on historical study of structure (Reed, 2005) | - Stems from the realisation that our knowledge of reality is the consequence of social conditioning that cannot be understood without considering the social actors involved (Saunders et al., 2016) |
| Interpretivism | - Interpretivism is clearly subjectivist in its emphasis on complexity, richness and various interpretations | - In particular, interpretivists focus on narratives, perceptions and interpretations (Saunders et al., 2016) | - The interpretivist philosophy requires the researcher to have an empathic perspective. However, interpretivism involves value-bound research |

| | | | |
|---|---|---|---|
| Postmodernism | - Postmodernism emphasises the role of language, power relations, questioning accepted ways of thinking, and giving voice to alternative marginalised views (Saunders et al., 2016) | - Postmodernists seek to bring to light what has been omitted or ignored through the deconstruction of what constitutes "reality" into the ideologies and power relations that support it, much like one might demolish an old structure into its bricks and mortar (Saunder et al., 2016) | - Postmodernism is value-constituted research. Fundamental is the recognition that power relations between the researcher and research subjects shape the knowledge created as part of the research process (Saunders et al., 2016) |
| Pragmatism | - Morgan (2014) asserted that pragmatism focuses on the nature of experience than reality comparing to other philosophies. | - Pragmatists are more interested in practical outcomes than abstract distinctions | - The reflexive process of inquiry, which is triggered by doubt and a sensation that something is wrong or out of place, is driven by researcher values (Saunders et al., 2016) |

Table 4.1. Five main philosophies – Source: from the research

| **Respondents** | **Roles** | **Field** | **Years of experience** | **Location** |
|---|---|---|---|---|
| A | Director | Finance | 8 months | Vietnam |
| B | Student | Business | 1 year | UK |
| C | Analyst | Technology | 8 months | Vietnam |
| D | Customer service | Technology | 1 year 2 months | Vietnam |
| E | Unemployed | | 2 years | Poland |
| F | Associate | Finance | 6 months | UK |
| G | Stockbroker | Finance | 3 years | Vietnam |
| H | Student | Finance | 2 years | UK |
| I | Student | Business | 6 months | UK |
| J | Software developer | Technology | 6 years | UK |

Table 4.2. Qualitative respondents' profiles- Source: from the research

**Chapter 5: Data findings for qualitative method**

| Variables | Question | Area affected by variables |
|---|---|---|
| Price movement | I am influenced by price movement | Perception |
| | I choose to hold when the market performance is poor | Perception – Behaviour |
| | I forecast changes in cryptocurrency prices based on past cryptocurrency price | Behaviour |
| | I rely on my previous experiences in cryptocurrency market for my next investment | Behaviour |
| | After a prior gain, I am more risk seeking than before | Perception |
| | After a prior loss, I am more risk averse than before | Perception |
| | After a prior loss, I tend to avoid the same investing strategy | Behaviour |
| Trust in the system | I trust the security of blockchain and cryptocurrency system | Perception |
| | I feel safe when investing/trading on a cryptocurrency platform as it could not be hacked | Perception |

| | | |
|---|---|---|
| Friends and family | I invest in cryptocurrency because of my friends/family/colleagues | Perception |
| | Other investors' decisions when choosing cryptocurrency coins have an impact on my investment decisions | Perception – Behaviour |
| | Other investors' decisions about cryptocurrency volume have an impact on my investment decisions | Perception – Behaviour |

Table 5.1. Questions developed from the qualitative stage

## Chapter 6: Data findings for quantitative method

| **Likert scale options** | **Labels** |
|---|---|
| Strongly agree | 0 |
| Agree | 1 |
| Neutral | 2 |
| Disagree | 3 |
| Strongly disagree | 4 |

Table 6.1. Labels of answers

| **Hypothesis** | | **Outcomes** |
|---|---|---|
| 1 | There is a correlation between millennial investors' perceptions and economic factors (price movement) | Yes |
| 2 | There is a correlation between millennial investors' perceptions and technological factors (trust in the system) | Yes |
| 3 | There is a correlation between millennial investors' perceptions and social factors (friends and family) | Yes |
| 4 | There is a correlation between millennial investors' perceptions and government factors (tax scheme) | Yes |

Table 7.1. Summaries of the hypotheses' outcomes – Source: from the research