

CHAPTER II

REVIEW OF RELATED LITERATURE

2.1. Chapter Introduction

This chapter presents a review of related literature which comprises a review of prior studies, the reason why this research is different from the previous studies, and a few theories related to the research topic.

2.2. Theoretical Review

The theories used as the research basis cover theories about fraud including the Fraud Triangle and internet fraud, theories about official bodies including official bodies used in this research, theories about social media (specifically Twitter), theories about financial technology, and theories about cryptocurrency including theories about Bitcoin and blockchain technology.

2.2.1 Fraud

Generally, the term "fraud" defines every action which is intentionally done by someone or a group of people (Albrecht, Albrecht, Albrecht, & Zimbelman, 2012). Albrecht et al., (2012) specifically described fraud as; “A *representation* about a *material* point, which is *false* and *intentionally or recklessly* so, which is *believed* and *acted upon* by the victim to the victim’s *damage*.” Moreover, Stamler, Marschdorf, and Possamai (2014) argue that fraud is an action where the preparator is a liar who does not give a real truth of a situation to gain his or her own advantages, and those lying acts will not be revealed within a certain period of time.

The term fraud is commonplace in the world of crime, especially when it

comes to financial crime. As technology developed, it is not a secret anymore that criminals often use technology as their main way to commit a crime. Fraud in financial crime can be in a form of anything. There is a survey conducted by PricewaterhouseCoopers, that around 49% of the companies around the world experienced fraud and economic crime; Africa as a territory had the highest percentage of fraud and economic crimes that occurred for 62% in 2018 (Lavion, 2018). It makes almost 50% of the companies who were questioned as the respondents, had experienced fraud. That is why, fraud has become more common, yet dangerous, in the future.

As we know that fraud is mainly something which is done intentionally. The intentional acts make "fraud" have a different description, that depends on the conditions (Singleton & Singleton, 2010). Singleton and Singleton (2010), in the book entitled *Fraud Auditing and Forensic Accounting*, has listed the most common description related to fraud—that we can conclude these are the most common fraud which happens—are as follows;

1. Fraud as a crime: fraud which includes surprise, trick and cunning.
2. Corporate fraud: fraud is committed by a business corporation.
3. Management fraud: fraud is committed by the employee—in this case, is the manager—who wants to get individual benefit after committing fraud such as commission, bonuses, and so on.
4. Layperson's definition of fraud: the common fraud definition which includes any form of lying.

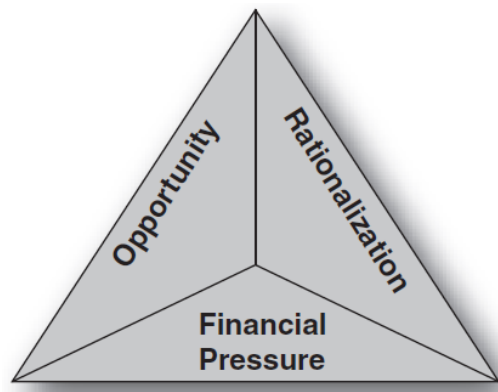
2.2.1.1 Fraud Triangle Theory

There are few factors that make people commit fraud. These factors are called a *Fraud Triangle*. Fraud triangle was first proposed by Cressey in 1953. The fraud triangle proposed by Cressey are; *Pressure*, *Opportunity*, and *Rationalization*. Goldmann (2009) explained that the meaning of Cressey's fraud triangle theory was how the 'innocent' people who never committed such crime before were starting to commit fraud if things such as opportunity, pressure, and rationalization exist to motivate them to commit fraud. Meanwhile, according to Petrucelli (2012), the fraud itself only happened when people commit fraud; it will always depend on each person's ambition and whether they are able to commit fraudulent activities. Moreover, as cited by Goldmann (2009) from Cressey's in his book *Other People's Money*:

Trusted persons become trust violators when they conceive of themselves as having a financial problem which is 'non-sharable', are aware this problem can be secretly resolved by violation of the position of financial trust, and are able to apply to their own conduct in that situation verbalizations which enable them to adjust their conceptions of themselves as trusted persons with their conceptions of themselves as users of the entrusted fund or property.

(Cressey, 1953, cited in Goldmann, 2009, p. 15)

Figure 2.1 Cressey's Fraud Triangle Concept



Source: Singleton & Singleton (2010)

Cressey later categorized the fraud triangle into three kinds of main factors why people commit fraud; *Pressure*, *Opportunity*, and *Rationalization*.

1. ***Pressure:*** Pressure seems to always be related to the financial situation of the preparator; inability to pay the debt, greed—having more money and so on (Albrecht et al., 2012; Goldmann, 2009; Petrucelli, 2012). Biegelman (2013) added that pressure could be a result of one's ego, even though money is not their main motive when the fraudsters are able to take revenge and satisfied with the result, that will be enough for them.
2. ***Opportunity:*** Sometimes, the fraudster is able to commit fraud when there is an opportunity ahead. Fraud then usually happens when the fraudster has understood how the system works and the weakness of the system (Biegelman, 2013; Goldmann, 2009). Albrecht et al. (2012) described that the opportunity for fraudsters comes when they are in a situation of being able to hide their fraud activities.
3. ***Rationalization:*** Rationalization is the act of believing fraud is something 'acceptable', that fraudsters are not in a wrong position when they commit it (Albrecht et al., 2012; Goldmann, 2009). Biegelman (2013) further explained, when the fraudster is arrested because of his or her conduct, they usually do not think that their action is wrong because their mind has been controlled with the rationalization.

2.2.1.2 Internet Fraud

Internet fraud usually happens via a computer, which is later called 'computer fraud'. Briefly, Vahdati and Yasini (2015) explained that computer fraud is the same as internet fraud. Department of Justice (as cited by Kunz and Wilson, 2004) described the internet fraud as something which involves a fraudulent activity that happens in websites, email, chat rooms, and any other internet platforms. The terms of computer fraud (or internet fraud) come to light because it is infamous for the fraudster to commit the fraud using a computer since any kind of action if they do it with a computer will become faster (Petrucci, 2012). Rusch (2003) described that nowadays the internet-related fraud has been prevalent, in which popularly the fraud happens in a form of online auction scheme or identity theft.

Kunz and Wilson (2004) listed some internet frauds that usually happen. They are;

a. Advance Fee Fraud Scheme

The victim should pay a sum of money to get more money or goods.

b. Business/Employment Scheme

Related to identity theft; the fraudster steals the victim's identity and uses it to make a credit payment.

c. Counterfeit Check

The victim (seller) is asked to deposit a check, in which the amount is larger than the selling price. After the bank releases the funds from cashier check, the fraudster cancels their purchase and demands a

return over their payment. Consequently, the victim will be responsible for the full amount of check.

d. Credit/Debit Card Fraud

Usually related to the credit card holder's identity being stolen, and the fraudster uses the information to make a credit transaction.

e. Identity Theft

Victim's private identity information such as credit card number, debit card number, passwords, birth date, and so on being stolen by the fraudster and used to commit another crime.

f. Investment Fraud

Fraudulent activities in which the fraudster tries to obtain something from the investment or loans from securities company.

g. Non-delivery of Goods

The situation where the victims purchase goods, but the good never arrive.

h. Ponzi/Pyramid Scheme

This is when the investment company (the fraudster) promising if people invest their money in that company, they will receive a high profit. In the end, the promises are fake, and the investor (the victims) do not receive the promised return.

i. Spoofing/Phishing

This scheme happens when fraudsters copying a legal website, by stealing the victim's private information as the victim is accessing

the 'fake' website made by the fraudster.

Moreover, as technology develops, the variety of internet crime also increases. Federal Bureau of Investigation (2017) listed some internet crime types which gradually the victims and the losses of those types of internet crime are increasing. Those types of internet crime are social media and virtual currency. FBI described that in 2017, the crime arose due to increased social media use. In this case, the criminal used social media as an instrument to commit fraud using virtual currency (Federal Bureau of Investigation, 2017).

2.2.2 Financial Technology

Financial technology is related to the shape of the system and procedure in order to be able to produce financial goods such as money, bond, and so on (Freedman, 2006). Arner, Barberis, and Buckley (2015) further explained that financial technology is when the financial and information technology are combined then produce new technology to provide financial solutions. Zavolokina, Dolata, and Schwabe (2016) described the financial technology phenomenon as a result of two other phenomena which are the financial invention and digital invention. Similarly, Philippon (2016) also stated that financial technology or usually called as 'FinTech' is responsible for the digital invention in the financial world. Additionally, according to Freedman (2006) in order to provide fast financial technology services, financial technology would rely on standard protected communication procedure. Koch and Siering (2017) described that the FinTech is the phenomenon which made financial services to be developed in a digital form; digital financing, digital investment, digital money, digital payments, digital

insurance, and digital financial advice. The examples of what we called FinTech are cryptocurrency, crowdfunding, mobile payment system, and so on (Philippon, 2016).

The invention of FinTech itself has brought the society conveniences nowadays. The conveniences include transparent financial information, the easy access to information, and cheaper cost (Zavolokina et al., 2016). Furthermore, the easy transaction that people wants resulting from the growth of the internet has forced the FinTech phenomenon to be developed (Koch & Siering, 2017). The interesting fact was stated by Koch and Siering (2017) that the IT companies, in fact, are the ones behind the FinTech phenomenon, where they found the solutions for the financial services.

2.2.3 Cryptocurrency

As already explained in financial technology literature, cryptocurrency is one of the inventions in financial technology. Cryptocurrency itself is a system which uses a cryptography technology in order to regulate and to generate new coins (Irwin & Milad, 2016). Cryptocurrency can be classified as a payment system and virtual currency, although it is more widely used as a payment system (Dostov & Shust, 2014). Moreover, according to the Dostov and Shust (2014), different from the traditional currencies, cryptocurrency is having a decentralized system where it does not need the central bank to store the currency and the users only need to store their cryptocurrency in their computer or other devices. This is what we call the cryptocurrency as *a peer-to-peer network* (Pak & Koo, 2015). This is when the computer or other devices are lost or broken, the cryptocurrency will also be lost,

as what people experience when they lost their wallet, the money inside their wallet will be lost too (Choo, 2015). Cryptocurrency has been designed in order to be able to circulate without the help of government nor central bank and is self-regulating (Irwin & Milad, 2016). In addition, it has a technology to preserve the identity of the users when they are having a transaction using cryptocurrency, but the transaction is recorded and it can be publicly accessed by other users (Papadopoulos, 2015).

2.2.3.1.Bitcoin

Bitcoin is one of the examples of cryptocurrencies. It the most well-known cryptocurrency with the largest market capitalization (Irwin & Milad, 2016; Papadopoulos, 2015). Bitcoin invention was first proposed by someone claimed to be “Satoshi Nakamoto”, aiming at overcoming the double-spending problem which happens in digital payment system (Nakamoto, 2008). Compared with the traditional currencies, the absence of the third party in Bitcoin offers inexpensive transaction fees (Papadopoulos, 2015). When people want to mine the Bitcoin, they have to solve a series of mathematical code and participate with other miners in order to get the Bitcoin (Pak & Koo, 2015). Nakamoto (2008) the inventor of Bitcoin stated this process is a part of Bitcoin’s protocol called *proof-of-work* (*PoW*).

At the time this research is written, Bitcoin still can be mined until the year of 2040, when it will be the year of Bitcoin having its maximum amount for 21 million—and if that amount is reached, Bitcoin cannot be mined anymore (Pak & Koo, 2015). In order to be able to perform a ‘mining’ activity, the potential new

users of Bitcoin can make their own Bitcoin wallet, where it will be the place where the users save their Bitcoin (Böhme, Christin, Edelman, & Moore, 2015). The mining activity itself is where the Bitcoin users are able to keep the blockchain and add the new blocks inside it, and if the users are able to keep the blockchain, they will be rewarded with the new Bitcoins in their wallet (Bhaskar & Kuo, 2015).

2.2.3.2. Blockchain

The blockchain is the technology which allows cryptocurrencies including Bitcoin to be able to operate (PricewaterhouseCooper, 2016). Blockchain itself is not only used as a basis of technology to operate the cryptocurrencies only, but it also used on a various field such as data administration, financial services, cybersecurity, IoT, food science, and health care (Siyal et al., 2019). Siyal et al. (2019) described the fundamentals of blockchain and those fundamentals are;

a. Decentralized

It means that the blockchain technology can be controlled anywhere and not only from one main central system.

b. Transparent

The blockchain's users are shown how the data are processed and updated in order to prevent the data from stealing.

c. Immutable

The data in the blockchain system already processed and saved cannot be altered without the agreement from 51% of the nodes.

d. Autonomy

The blockchain system can independently be processed, updated,

and save its own data without the help of external parties.

e. Open source

When the blockchain's users are connected in the network, they can use the information provided in the blockchain's system since the blockchain made the information to be an open source for its users to develop the system.

f. Anonymity

The blockchain system requires users to be anonymous, as it will be easier to keep the data protected and dependable.

Rennock, Cohn, and Butcher (2018, p.36) described blockchain into two categories; *Permissioned blockchains*—a of blockchain used by certain organization and its access is not a public open source network; and *Permission lessor public blockchains*—this kind of blockchain usually found in cryptocurrency's system such as Bitcoins, where the source of network is an open source to the users of the blockchains and it does not need specific permission to enter the network. When we are talking about the cryptocurrency, the kind of blockchain that represent the cryptocurrency's system is the *public blockchain* one.

Another thing that Rennock et al. (2018, p.37) described is how the blockchain works in a brief way; when a user wants to transfer, for example, Bitcoin to another user, in order the transaction to be processed, the transaction called *block* should be informed to the users in a network. Once the transaction is being approved by the users in a network, the transaction can be processed, thus it will make the transaction succeed, and the Bitcoin is transferred.

2.2.4 Social Media

In 2018, the term "Social Media" is not something that we are not familiar with. On every stage of age, people know what social media is. Or at least, people know what can be called "Social Media". Social media is described as any kind of media which encircle the social media networking, where people can share their views, and opinions on certain topics to others (Nair, 2011). Nair also mentioned the well-known kinds of social media including YouTube, Twitter, and Facebook, which aim to link individuals to others. Moreover, with social media, people can create interactions with others, thus social media is able to make a revolution in the world, and vice versa. As such, it seems impossible to distinguish social media—which mainly connects the online platform—to our life (Miller et al., 2015).

The theory on the interaction in social media is also noted by Boyd (2007), “what makes social network sites unique is not that they allow individuals to meet strangers, but rather that they enable users to articulate and make visible their social networks.” (p.211). This statement is in line with other definitions about social media; which allows an individual has a connection with other individuals, even when they do not know each other in real life. Additionally, Boyd (2007) also stated that social media is more likely a place where people can share what they love, even to strangers.

Apart from the use of social media which will create a connection between each individual, even with a stranger, and share their opinion and view of something, Nair (2011) noted an interesting thing about social media; the interesting thing about social media is that it can be a platform to raise power on a

larger scale. In other words, people or an individual can look up for other people's trust in anything so that they can have some power to influence from social media.

The idea of social media, as stated by Murthy (2012) is permitting the non-professional users generating their own news platform, and the user will not have to pay the fee for using the social media, moreover, it is interactive and networked. Additionally, another idea about social media is that it has converted what the so-called as a community into an individual column, which in turn later converted into a cluster or a group. Further, in the cluster, there will be some people who communicate with each other (Miller et al., 2015)

2.2.3.1 Twitter

Twitter (2018a) describes itself as “what’s happening in the world and what people are talking about right now”. Meanwhile, Twitter, as described by Singh, Shakya, & Biswas (2016), is a social network which is very widespread and used commonly around the world, which they usually talk through "Tweet" in order to connect each user. Twitter is also called a "microblogging" site due to its limitation of character to post in a tweet (Murthy, 2012). It is called "microblogging" not only because of the limitation of character to post in a tweet. Jansen, Zhang, Sobel, and Chowdury (2009) argued Twitter as a microblogging site because, even though Twitter only lets its users have a talk and post their tweet in short post, they still can describe their passion and views, and share it to the users with the same passion and views. As twitter gave a new experience to the users in 2018 with the expanding character to 280 characters in a tweet, the microblogging site already presented a new commitment to their

users (Croom, 2018).

Twitter has features by which the users to communicate with other users. Those features are *tweet*, *retweet*, and *mention*. Wang, Wang, Bu, and Chen (2013) explained *tweet* is being used when people post their idea in Twitter, *retweet* is used when people want to share other users' tweet, and *mention*—for example '@Twitter username'—is used when people want their tweets to be noticed by a specific user. These features are also explained by Boyd, Golder, and Lotan (2010). They described similar meaning for tweets which are being used to post ideas in Twitter, retweet which is used to “copying and broadcasting”, and mention which means that the Twitter users want to have a direct conversation with other specific users.

Twitter (2018b) claimed it offers some experiences for its users. The main experiences that a user can get from Twitter as what it claims;

1. By getting started with Twitter, users can immediately find things that they like, and they will find people to follow.
2. Users can see what is happening in the world right now. Users can find out the trending hashtag and topics, users can find out what is the stories from the current biggest event in the world? All in the form of real-time events.
3. Users can follow their interests usually in a form of breaking news, entertainment, hobbies, and other interests as well. Other things that a user can do is sharing their favorite photos, videos, gifs, and so on.
4. Last, the important feature that a user can do which also makes a Twitter as the world's number one microblogging site is; by joining the

conversation with other Twitter's users. This is a feature by which they can post their own tweets, like other users' tweet, reply to other users' tweet, and retweet another users' tweet.

Additionally, even though there are a billion accounts on Twitter, but those billion accounts can be categorized into these classifications;

1. Personal Account

The first categorization of Twitter users is "Personal Account". A personal account is an account by which the owner is representing himself or herself. It is not that hard in qualifying whether an account is a personal account.

These are the characteristics of personal account which are easy to notice; the profile picture of the account is their own picture, meaning that they do not use a symbol which represents other accounts; the information on the profile is representing who they are (Uddin, Imran, & Sajjad, 2014); the tweets are varied, means that other than tweeting about Bitcoin, they also tweet about their usual life with emotions put in the tweets (Silva & Riloff, 2014); the location that they put in the profile is clear—they put a “real” location, and not a made up location.

2. News Account

There are many accounts which just repost titles of headline news and their links from news websites, but there are also accounts which post or share their own headline news from their website categorized as “News Account” (Uddin et al., 2014). The characteristics of a news account are quite hard to distinguish, but it does not mean that we cannot distinguish the news account

from other types of accounts.

According to Java, Song, Finin, and Tseng (2007) news account is an account which the main activity is to report headline news, hence it is categorized as a source of news account. The main difference or characteristics of a news account is; it has its own website. We can check out their information in the profile, if there is a website which provides news just like what the account has shared in the tweets section, then it is a news account. Next, the information about the account is formal; they put the news site's name, location, website link, and biodata written in the profile—indicating they are news accounts (Sharma, Ghosh, Benevenuto, Ganguly, & Gummadi, 2012). Last thing that it is also important; if we check out at the news that the account has shared, the news focus on one theme such as financial technology, sports, politics, etc. (Sharma et al., 2012).

3. Business Account

The business account might be the hardest one to distinguish, yet it can be easier for us to detect whether an account is a business account or news account. This account is categorized as a “Business Account” when there is one topic which the account talks about. This means that business account has certain behavior which shows their purpose as one of Twitter user types (Uddin et al., 2014). Choudhury, Diakopoulos, and Naaman (2012) explained that a business account can be categorized as organization type of account. Additionally, as an organization type of account, the business account is not

tweeting something personal (Silva & Riloff, 2014). Their profile will also contain a certain topic which indicates that they are the account who will talk about the certain topic only.

2.2.5 Official Bodies

An official body is an institution with legal permission when it was founded. The official body serves the public as its main activity. An official body will set some regulations which are valid for the public. The regulations that an official institution makes are considered as trusted and dependable compared to other institution. Official bodies that the researcher chose to be the research objects are central banks, legislative government agency, and law enforcement agency.

1. Central Bank

A central bank is where the regulations of money and currency in a country are controlled in order to maintain the country's financial situation throughout the time. Moreover, Reis (2013) described that a central bank “*can choose some instruments that it controls broadly, a policy directly, as well as a set of announcements about it, is of the or future knowledge economy policy intentions,*”. Central bank as a part of a government institution has an objective to serve the public in a country (Reis, 2013)

2. Legislative Branch Government Agency

The Legislative Branch Government agency is the branch agencies that run under the USA legislative government. They provide a variety of services, specified from functions. The legislative agency, described by Strøm (1994), is the agency which has its own procedure to accomplish legislative activities.

Similarly, Lowi (1996) also described the legislative branch is a branch in government in which they will create and write laws for the country.

3. *Law Enforcement Agency*

The Law Enforcement Agency is an agency which is engaged in the field of human intelligence, and the investigation of criminal movements such as terrorism, corruption, and cybercrime. Law enforcement agency is obliged to ensure the security of a country from criminals. American Society of International Law (1980, p. 527) stated that the law enforcement agency, “is part of the criminal justice system, the aim of which is to prevent and control crime, and that the conduct of every functionary within the system has an impact on the entire system”. The example of law enforcement agency includes the Federal Bureau System (FBI) and Central Intelligence Agency (CIA).

2.3. Previous Research

In the previous research, the researcher includes the studies which have been conducted by other researchers related to Bitcoin and how the people voiced their opinions using Twitter as a platform.

The first study was conducted by Henry, Huynh, and Nicholls (2017) which discussed the “*Bitcoin Awareness and Usage in Canada*”. They investigated how the awareness of people in Canada towards Bitcoin. Then, Henry et al. (2017) found out that some factors that influence awareness such as gender, men are more aware of Bitcoins; age, the younger aged are more aware of Bitcoin rather than the older; and also the one who is unemployed more aware of the Bitcoin's existences.

Moreover, the research about Bitcoin awareness was also conducted by

Gao, Clark, and Lindqvist (2016) in their research entitled “*Of Two Minds, Multiple Addresses, and One Ledger: Characterizing Opinions, Knowledge, and Perceptions of Bitcoin Across Users and Non-Users*”. In this study, they compared the awareness of Bitcoin from users' and non-users' point of view. The results of this research reveal that some differences found from two perceptions; the Bitcoin users were usually not familiar with Bitcoin's system and tended to have a misunderstanding with the privacy system; while the Bitcoin non-users thought that they cannot operate the Bitcoin system well (Gao et al., 2016).

Another Bitcoin awareness research conducted by Tsanidis, Nerantzaki, Karavasilis, Vrana, and Paschaloudis (2015) in their research entitled “*Greek Consumers and The Use of Bitcoin*”. They investigated the awareness of Bitcoin in Greece. The focus on the research is on consumer awareness as Greece is one of the countries with the lowest use of Bitcoin. The result then showed that the Bitcoin users tended to use the Bitcoin as payment and investment tools, while non-users were more watchful over the Bitcoin, that the awareness should be presented (Tsanidis et al., 2015).

On the other side, Khairuddin, Sas, Clinch, and Davies (2016) conducted research entitled “*Exploring Motivations among Bitcoin Users*” which investigates the motivation of Bitcoin users of buying and using Bitcoin. The result of the research showed that three motivations are mentioned on why the users buy and use Bitcoin. Those three motivations are; Bitcoin used to predict the monetary revolution, increases users' empowerment, and the users have an insight on the perception of Bitcoin's value (Khairuddin et al., 2016).

The fifth previous research discusses “*The Impact of Social Media in Bitcoin Performances*” which was conducted by Mai, Bai, Shan, Wang, and Chiang, (2015). The research found that social media, especially the microblogging like Twitter will boost the positive market performance on Bitcoin. Since the social media itself offers the price movement of Bitcoin, thus it will bring about an easier way for potential investors and also users on understanding Bitcoin (Mai et al., 2015).

The next research is about how Twitter can be the ‘Electronic Word of Mouth’ according to the research conducted by Jansen et al. (2009) entitled “*Twitter Power: Tweets as Electronic Word of Mouth*”. It is about how Twitter can be used as an influence on other people. The research found out that Twitter's linguistic structure is more than the traditional word of mouth, that it is useful to promote and influence people as a marketing approach (Jensen, Zhang, Sobel, & Chowdury, 2009). Similarly, research conducted by Matta, Lunesu, and Marchesi (2015) entitled “*Bitcoin Spread Prediction Using Social And Web Search Media*” that investigates how the impact of the Google search and Tweeter's tweets on Bitcoin's price. The result showed that when people tweet something positive related to Bitcoin, the price of Bitcoin would be better in the market (Matta et al., 2015).

The research knowing the impact on Bitcoin from the Twitter sentiment was also conducted by Stenqvist and Lonno (2017) in their research entitled “*Predicting Bitcoin Price Fluctuation with Twitter Sentiment Analysis*”. In this research, they analyzed the sentiment from the 140 Twitter tweet characters that could be impacted

to Bitcoin's price fluctuations. The result of this research revealed that the Twitter users' sentiment usually will change in the average of 1 hour, while the price fluctuation predictions change in 4 hours after that (Stenqvist & Lonno, 2017). Xie, Chen, and Hu (2017) in their research entitled "*Network Structure and Predictive Power of Social Media in the Bitcoin Market*" analyzed the impact of social media in a whole on the Bitcoin market. The research's result showed that in forecasting forthcoming returns in the Bitcoin market, smaller interconnected social media discussion is more accurate than bigger interconnected media discussion (Xie et al., 2017).

Another research related to the use of Twitter was conducted by Parise et al. (2015) entitled "*How Twitter Users Can Generate Better Ideas*". In this research, they analyzed employees which have a Twitter account, found that the bigger and diverse the network of a Twitter user, they will be given more idea and innovation than those who do not. Moreover, the findings of the research also described that people use Twitter for an idea connector and also for idea lookout (Parise et al., 2015).

Having reviewed the previous studies, a study which compares Twitter users' opinions and official bodies' opinions on Bitcoin—especially in relation to perceived fraud, have not been conducted. Thus, the researcher strongly believes that this research would make a new contribution to future research related to Bitcoin.