CHAPTER IV
ANALYSIS AND DISCUSSION

4.1. Chapter Introduction

Data analysis and discussion in chapter fourth will contain all the discussion and analysis related to the processed data. In this chapter, the first discussion will be an overview of the research objects' profile. Secondly, there will be analyzation and discussion on the pros and cons of Bitcoin from official bodies' point of view, and from Twitter users' point of view. After that, Twitter sociogram will reveal the connection between users through the tweets, retweets, mentions, and who follows who. Furthermore, the connection will show where Twitter's users' opinions come from; who influences who. Finally, the opinions of Twitter users and official bodies will be compared; do they have the same opinion regarding Bitcoin? Or do they mainly express different opinions?

4.2. Overview of Research Objects' Profile

This study has two research objects—official bodies and Twitter users. There are three kinds of official bodies; a central bank, legislative government body, and the law enforcement agency. In the meantime, the type of Twitter users, is divided based on type of account. The types of Twitter users' accounts are; personal account, news account, business account, and institutional account. The partition of Twitter accounts is based on the usual type of account that can be found on Twitter.

4.2.1. Official Bodies

1. Bank of England

The Bank of England serves as a central bank of England itself and Northern Ireland. It was first established in 1694, in Mercers Hall, Cheapside, with the first function was acting as a government's bank. The branches of the Bank of England later were founded in 1862, located in Gloucester. Current governor of Bank of England is Mark Carney (Bank of England, 2018). The Bank of England serves the public several services such as issuing banknotes, maintaining financial stability, regulating other banks, and setting monetary policy.

Moreover, the Bank of England is also responsible to Policymaking Committee, which consist of; Monetary Policy Committee (responsible for making decision about Bank Rate), Financial Policy Committee (responsible for monitoring the systemic risk to protect UK's financial system), and Prudential Regulation Committee (to make decision of Bank of England's responsibilities). In addition, the Bank of England has its own Audit Division which serves to help protect assets, sustainability, and to perform internal control and risk management (Bank of England, 2018).

2. Bank of Japan

The Bank of Japan serves as the central bank for Japan. It was established in 1882, headquartered in Tokyo, Japan. The current bank governor of Bank of Japan is Haruhiko Kuroda (Bank of Japan, 2018a). The Bank of Japan services are; issuance, circulation, and maintenance of banknotes,

services related to payment and settlement, conducting monetary policy, maintaining financial stability, any kind of services and transaction related to Japan's government, and general internal control system (Bank of Japan, 2018a)

Bank of Japan also provides some main activities. The main activities are deciding the Bank of Japan's organizational principles (public interest, transparency, excellence, integrity, effectiveness and efficiency); deciding the Bank of Japan's strategic priorities, and making the Bank of Japan's annual review of the Japan's monetary activities (Bank of Japan, 2018b)

3. Deutsche Bundesbank

The Deutsche Bundesbank is a central bank of the Federal Republic of Germany. It was first established in 1957 headquartered in Frankfurt, Germany. The current president of Deutsche Bundesbank is Jens Weidman (Deutsche Bundesbank, 2018d). The main obligations of Deutsche Bundesbank are; conducting monetary policy, maintaining financial and monetary system, banking supervision, cash management, and payments system (Deutsche Bundesbank, 2018b).

It is the responsibility of Deutsche Bundesbank's monetary policy to maintain price stability, in which the decision is approved by the President of Bundesbank. Other responsibilities include economic publication, main refinancing operations, and tender calendar and system (Deutsche Bundesbank, 2018f). In addition, Deutsche Bundesbank's financial monetary system is responsible for analyzing the risk and identifying the threats of financial crises. The activities include proceedings of policy evaluation workshop published,

reviewing financial stability, adopting reports on cybersecurity for G7 countries, having internal corporation with other European official bodies (Deutsche Bundesbank, 2018e). In the meantime, their banking supervision is responsible for monitoring credit institution's business activities and investor's confidence (Deutsche Bundesbank, 2018a). For Deutsche Bundesbank's cash management, it is responsible for high quality of euro and changing defective money—coins and banknotes (Deutsche Bundesbank, 2018c). Last task is the responsibility of payment system. The responsibility of payment system is to provide the settlement and stable financial system as well as future development (Deutsche Bundesbank, 2018g).

4. European Central Bank

The European Central Bank (ECB), a central bank which regulates all the countries in the Euro area, has made itself the biggest central bank in European continent. It was first established in 1988, headquartered in Frankfurt, Germany. The current president of the European Central Bank is Mario Draghi (European Central Bank, 2018b). The main obligations of the European Central Bank are implementing monetary policy, conducting a foreign exchange, holding and managing the currency around the Euro area, and payments system (European Central Bank, 2018a).

The responsibilities of ECB's monetary policy are to maintain price stability, which refers to the two main monetary policy's pillars. The next task is about financial stability and macroprudential policy, which is responsible for prevention of extreme increase in risk from external factors, strengthening the

financial condition, and reassuring the financial regulation to generate the right set of motivations for market participants. Next is the responsibilities related to banknotes—to put the banknotes and coins into movement with the banking system to a lesser level the retail industry. In payment and securities, the ECB's responsibilities are to encourage the great operation of payment and settlement system. It is also responsible for having a great relationship with other European official bodies and the international affairs. The last tasks of ECB are ECB's foreign reserves and own funds, namely keeping the sufficient liquidity with foreign exchange (including the transfer assets) and ECB's foreign exchange operations which include the foreign exchange interventions (European Central Bank, 2018c).

5. Federal Reserve Bank

Federal Reserve Bank is a central bank which regulates the monetary system in the USA. It was first established in 1913, headquartered in Washington D.C, USA. The current chairman of Federal Reserve Bank is Jerome Powell (Federal Reserve Bank, 2018b). The main obligations of the Federal Reserve Bank are conducting the monetary policy, supervising and regulating banks throughout the USA, maintaining the financial and monetary system, and other services and transactions related to U. S's government, financial institution, and everything related to payment system (Federal Reserve Bank, 2018a).

In detail, the purpose and function of Federal Reserve Bank are; first is conducting monetary policy, which responsible for price stability, controlling

the long-term interest rate of US and promoting maximum employment; second, promoting financial system stability, by monitoring financial system risk for a healthy economy in US; third, supervising and regulating financial institution and activities, by encouraging the safety of financial system as a whole; fourth, fostering payment and settlement system safety and efficiency, by conducting the safety, efficient, and reachable dollar transaction system; the last one is promoting consumer protection and community development, by increasing the understanding on the influences of financial services policies over the public (Federal Reserve Bank, 2018c).

6. Reserve Bank of New Zealand

The Reserve Bank of New Zealand (RBNZ) is a central bank which regulates all monetary activities in New Zealand. It was first established in 1936, headquartered in Wellington, New Zealand. The current governor of Reserve Bank of New Zealand is Adrian Orr (Reserve Bank of New Zealand, 2018b). The main obligations of Reserve Bank of New Zealand are operating monetary policy, assisting efficiency and function of the financial system, regulates the currency, operating effective payments system, and other support services of the bank itself (Reserve Bank of New Zealand, 2018a).

Meanwhile, the responsibilities of RBNZ are making annual reports, which are released of maximally three months after the end of fiscal year; the policy targets agreements, in which the agreements would be about the price stability and already negotiated between the government and Reserve bank; the statement of intent, which is about the foresee of RBNZ's objectives and budget

for the next three periods; the funding agreements which is concerned with five year funding agreement between the Governor and Minister of Finance; briefings to the Minister, in this case, the RBNZ is responsible to brief the Minister, letters of expectations, which deals with writing the 'relationship expectations' between Bank and the Minister; memoranda of understanding, which is aimed at having the other parties understand with the principles; and *Te Reo Māori* financial glossary, which means the responsibility of having a good relationship with stakeholders (Reserve Bank of New Zealand, 2018a).

7. US Government Accountability Office

The US Government Accountability Office is one of the legislative branch government agencies under the USA legislative government. It is a legislative branch which functions to evaluate the federal government's taxpayer dollars activity. It was established in 1921, headquartered in Washington, D.C, USA. Gene L. Dorado is the current head of GAO (Government Accountability Office, 2018b). The work of GAO is specifically, carried out of the request of congressional committees. The works are as follows;

1. Auditing the agency operations
2. Investigating illegal activities
3. Reporting the effectiveness and efficiency of government program and policies
4. Performing policy analyses
5. And issuing legal decisions and opinions (Government

Accountability Office, 2018a).

8. Federal Bureau of Investigation

The Federal Bureau of Investigation, or famously called as "FBI" is a law enforcement agency which was founded in 1908 by J. Edgar Hoover in the USA. The current director of FBI is Christopher Wray (Federal Bureau of Investigation, 2018b).

FBI's main investigations include;

1. Terrorism, this is the main activity of FBI to protect the USA from terrorism;
2. Counterintelligence, the activity to identify threats to national security;
3. Cybercrime, the activity to investigate kinds of cyber-attacks;
4. Public corruption, where the FBI is responsible for investigating fraudulent activities in the government, investigating the drug and weapons trafficking, alien smuggling, espionage, and terrorism; civil rights, the FBI’s responsibility is to investigate the issues of Hate Crimes, Color of Law, Human Trafficking, and Freedom of Access to Clinic Entrance;
5. Organized crime, which is responsible for investigating illegal and structured crime activities committed by group of people including drug trafficking, migrant smuggling, human trafficking, etc.;
6. White-collar crime, FBI is responsible for all crimes committed by business and government professionals;

7. Violent crime, FBI is responsible for investigating violent crimes such as mass killings, sniper murders, or serial killers
8. The last one is Weapons of Mass Destruction (WMD), the weapons classified as WMD are explosive weapons, weapons to kill innocent living, weapons that involve a disease organism, and weapons which have radiation.

Furthermore, the services that FBI provides are Criminal Justice Information Services (CJIS), laboratory services, training academy, operational technology, and information management (Federal Bureau of Investigation, 2018a).

9. Reserve Bank of Zimbabwe

The Reserve Bank of Zimbabwe is a central bank which regulates the financial in Zimbabwe. It was first established in 1956, initially called the Bank of Rhodesia and Nyasaland. Reserve Bank of Zimbabwe has a vision to be the responsive central bank and its mission is to supervise the stability of Zimbabwe's financial system (Reserve Bank of Zimbabwe, 2018). The current headquarter is located in Samora Machel Avenue. Reserve Bank of Zimbabwe's governor is Dr. J. P. Mangudya.

According to Reserve Bank of Zimbabwe (2018), the function of the central bank is to control the monetary policy design and application, to issue bank notes and coins, curator of gold and other external assets, to be a banker and as government's counselor, to be the bankers' bank and lender of last alternative. As a central bank, Reserve Bank of Zimbabwe also publish some

publications. Those publications are Annual Reports, Quarterly Economic Review, Monthly Economic Review, Weekly Economic Review, Bank Supervision Publication, Exchange Control Publication, National Payment System, and Financial Intelligence Unit Publication (Reserve Bank of Zimbabwe, 2018).

4.2.2. Twitter Users

The data in this study were gathered using NVivo. 4296 records (tweets and retweets) have been obtained. Then the data were filtered that they amount to 1751 records.

4.2.2.1. Overview of Tweets Based on Location

Figure 4.1 shows a geovisualization map which tells us about where the tweets are coming from. The number that we see on the pin is the amount of tweet(s) in each place. The location is stated based on the information in the user's profile (QSR International, 2015g). On the overall map which we can see the overview of the tweets origin based on the continent, North America and Europe are the most crowded areas, which means they have the highest tweets. Additionally, Australia and Antarctica are the continents which have the lowest number of tweets among those seven continents (North America, South America, Australia, Europe, Asia, Africa, and Antarctica).

Figure 4.1 Visualization of Produced Tweets Based on the Location

Source: Data is processed with NVIVO 11 Plus by researcher

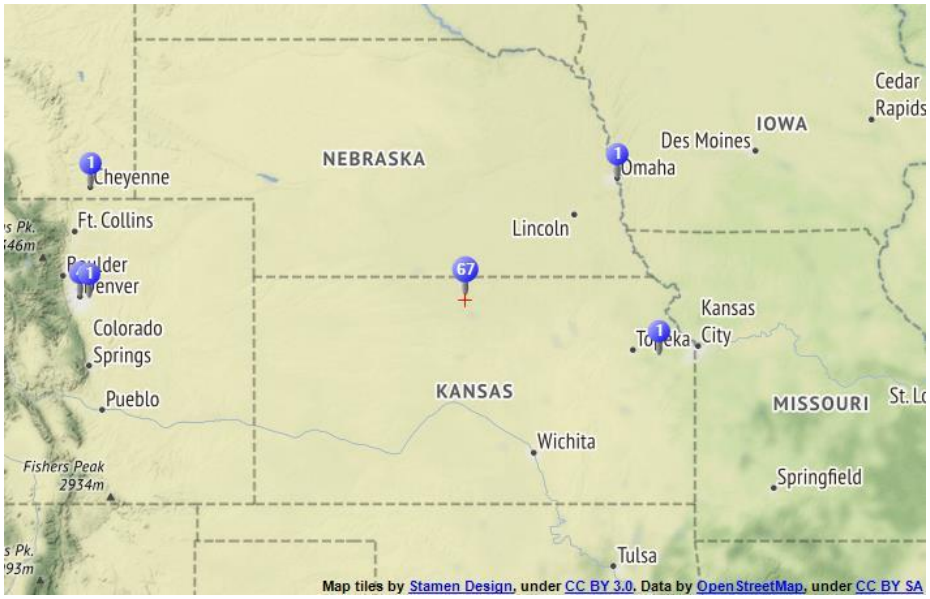
Note: The Twitter users who do not include their locations in their accounts are not counted.

The geovisualization map demonstrates that, people who live in North America and Europe—the highest ones—have high interest in talking about cryptocurrency, especially bitcoin. Meanwhile, Australia and Antarctica—the lowest ones—have low interest in talking about bitcoin. It also indicates that in North America and Europe, there are arguments among Twitter users about whether bitcoin contains fraud. Another argument says the arguments of those who think that there is nothing goes wrong with bitcoin, because it brings many

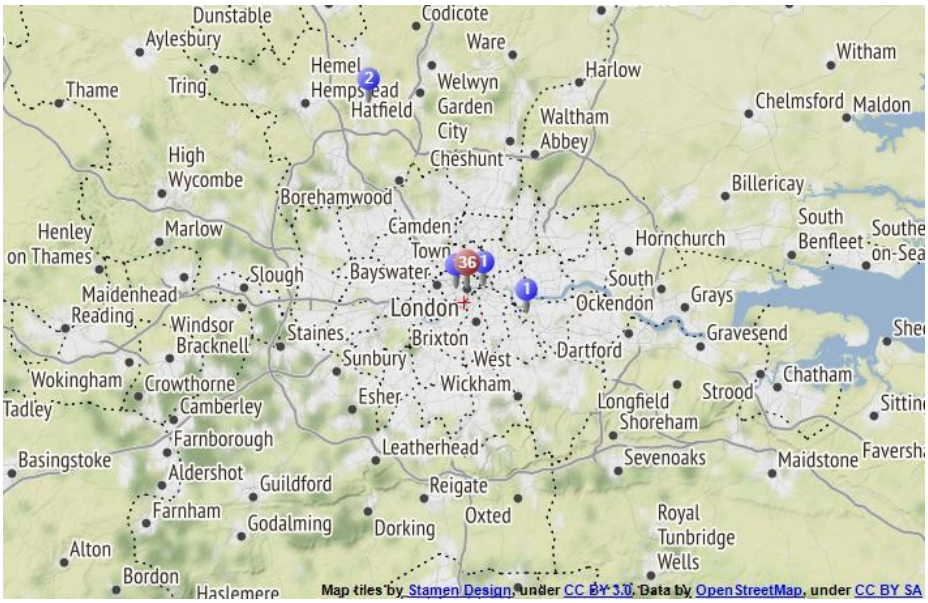
benefits.

If we look closer on the map, we can see the detailed location on where most of the tweets come from. In North America, most of the tweets come from Kansas which amount to 67 tweets. Meanwhile, in Europe, a location where most of the tweets come from is London, United Kingdom; there are 36 tweets in total, and it becomes the second highest tweets posted after Kansas. To conclude, people in Kansas and London are those who constantly talk about bitcoin and its presumption of fraud.

Figure 4.2 Closer Look of Visualization Produced Tweets Based on Location



(a) A closer look of Kansas, the USA with 67 tweets



(b) A closer look of London, the UK with 36 tweets

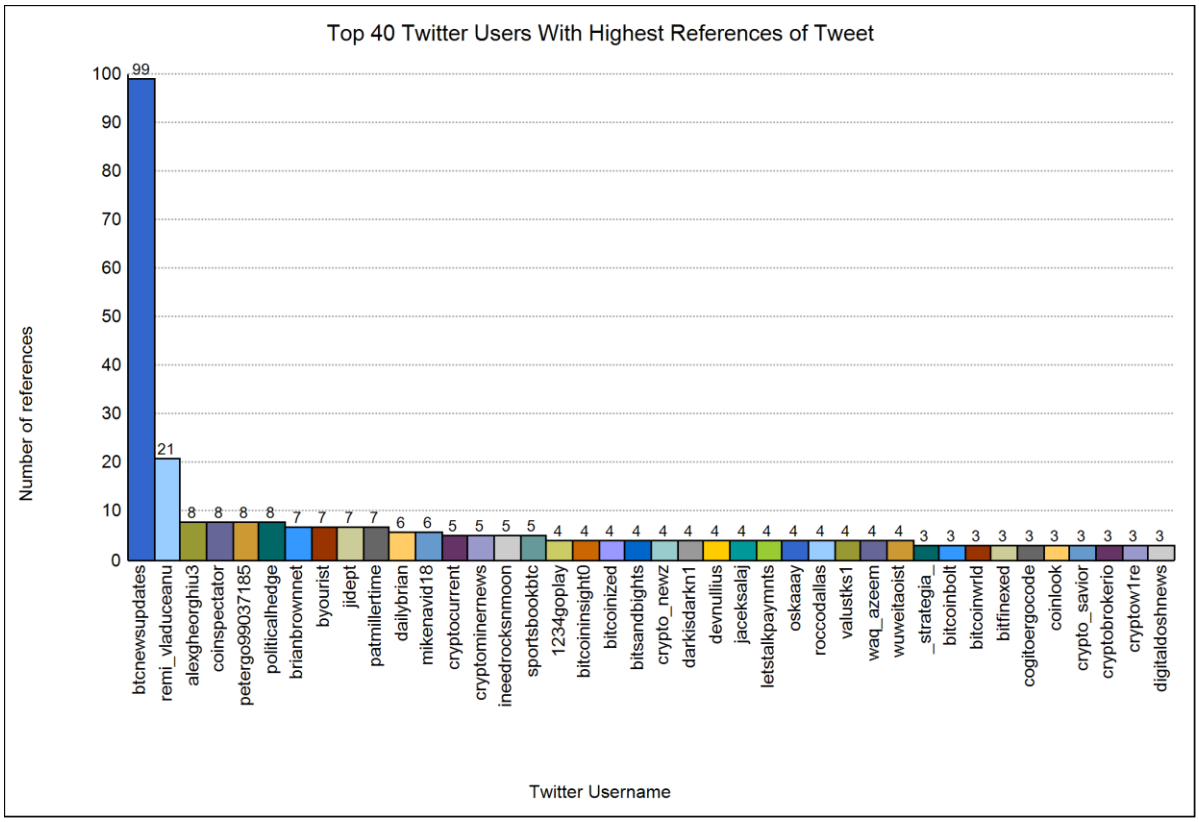
Source: Data is processed with NVIVO 11 Plus by researcher

Note: The Twitter users who do not include their location in the account is not counted.

4.2.2.2. Overview of Tweets Based on Highest References

Since we have many tweets which originates from seven continents, finding out the highest number of references (tweets) is important. Out of 1751 records, the total accounts of Twitter users considered to be the main research objects are 40 (forty) accounts. Lists of Twitter users are from those who have the highest impacts and references. Figure 4.3 provides an overview about who has the highest references and impacts on their tweets:

Figure 4.3 Top 40 Twitter Users with Highest References



Source: Data is processed with NVIVO 11 Plus

Note: The chart above is presented after the Tweet type being filtered equals to 'Tweet' only.

The significant amount of references, which is 99 references, is achieved by BTCNewsUpdates. Those 99 references are from activities done by BTCNewsUpdates. Those activities include replying other tweets from different accounts and posting their own tweets. This indicates that BTCNewsUpdates is the most active account, in terms of posting tweets, replying other tweets, and mentioning other accounts.

In addition, the second highest place of references with an indication of active account in terms of posting tweets and replying other tweets, is achieved

by Remi_Vladuceanu. Even though the number of references is not as high as BTCNewsUpdates, but the number is still significant, in sense that the other accounts have similar achievement in their references number. The references range from eight to three references. The other accounts only have one to two number of differences. Furthermore, as we can see from the chart above, accounts with the smallest number of references are; _Strategia_, CoinLook, CryptoBrokerIO, Cryptow1re, DigitalDoshNews, and BitcoinBolt.

Considering that the data is already filtered—only contains tweets and exclude retweets—the top 40 users are those who have the highest references in terms of posting tweets and replying other tweets. This kind of condition gives insight that there are only a few Twitter users who voice their opinions. This also indicates that the 40 users are the people who have a better understanding of cryptocurrency—especially in bitcoin—since they are confident enough to share their opinions, instead of retweeting other people's tweets. To put it another way, they are a type of "followers" who just agree with the tweets which are not their own.

4.3. Pros and Cons of Bitcoin from Official Bodies' Point of View

When the news about innovation and technology of virtual currency called "Bitcoin" in financial world had bubbled to the surface, many official bodies such as government bodies and central banks around the world started to include this innovation in their official reports. The official bodies began to question whether this innovation has disadvantages or advantages, both to the current financial system and the users who collect, mine, and make transactions—such as payments

or investments. The pros and cons of Bitcoin from official bodies' opinions will be divided into the "General Opinion", which discusses Bitcoin in general, and second pros and cos of Bitcoin will be those related to fraud.

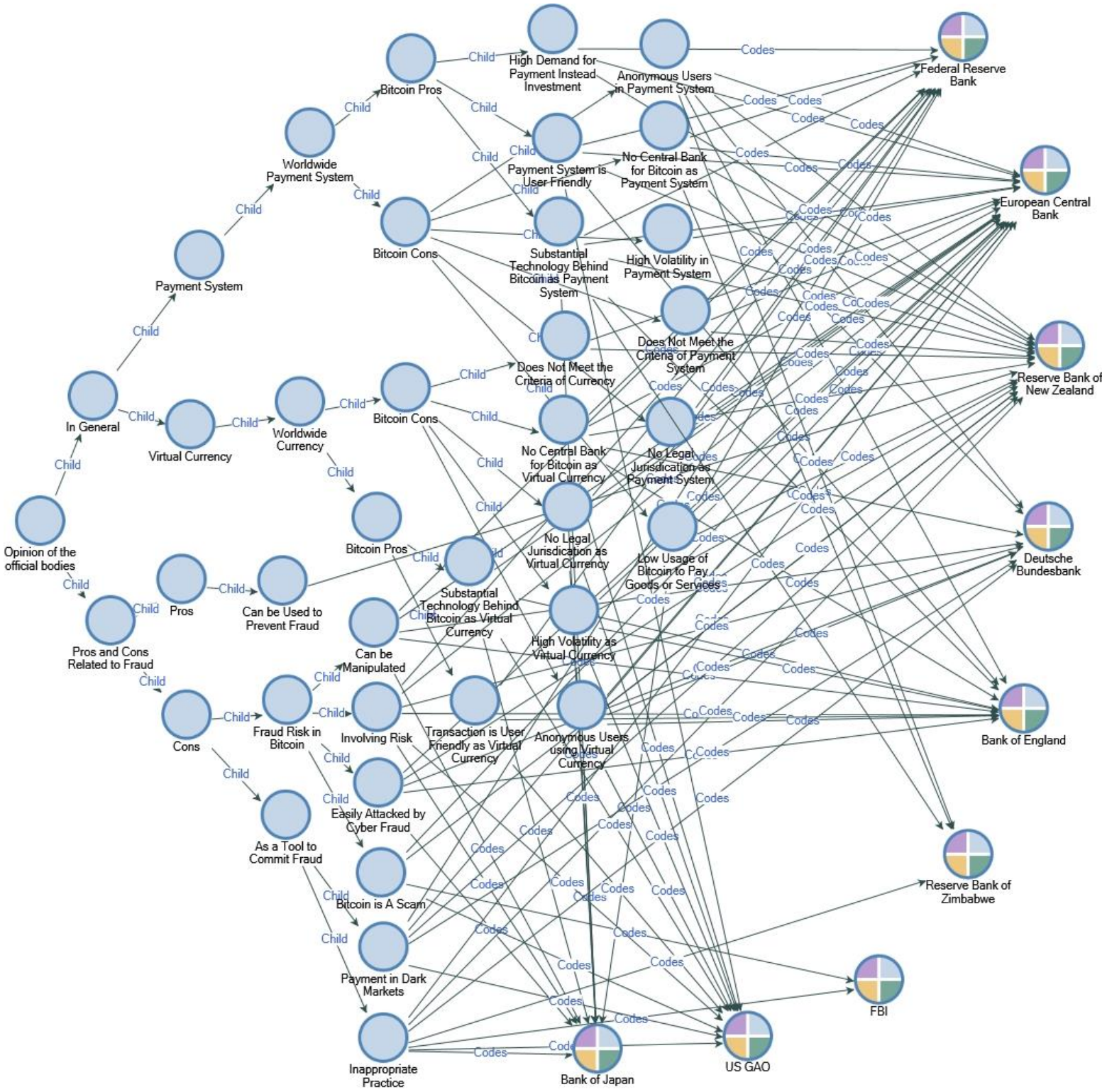
From figure 4.4, we can see that not every official body has only one opinion. Most of the official bodies give the same opinions related to Bitcoin and not being biased toward one opinion only. For example, the opinion on they only stated their con opinion or the opinion on pro opinion. As they are the official bodies, they know exactly the advantages and disadvantages of Bitcoin in the financial system. They provide us objective opinions related to Bitcoin innovation, which lead to more deep understanding on Bitcoin.

Except for Federal Bureau Investigation (FBI) who express a strong opinion about the cons of Bitcoin. This is because FBI itself is a Law Enforcement Agency, who deal with cybercrime, including the cybercrime that is happens using Bitcoin as a tool. Table 4.1, it shows the advanced data set, which refers to the sources from official bodies who have voiced their opinions related to pros and cons of Bitcoin. If we refer to the column of European Central Bank (ECB), which presented all the official bodies' name, we can see that (ECB) voiced almost every kind of opinions. And some of the opinions indicated that ECB not only contributed one source but has mainly two up to three sources in just an opinion. ECB has only missed some opinion about "Transaction is user friendly as virtual currency", which falls under the pros of Bitcoin as a virtual currency, and "Can be used to prevent fraud", which falls under the pros of Bitcoin related to fraud.

In contrast, Federal Bureau Investigation (FBI) only contributes two kinds

of opinions, from a total of 23 nodes of opinion related to pros and cons of Bitcoin. FBI only voiced their opinions on “Inappropriate practice” and “Bitcoin is a scam”, and both opinions tend to be the cons of Bitcoin related to Fraud.

Figure 4.4 Analytical Map of Pros and Cons of Bitcoin Opinions from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher

Table 4.1 Matrix Coding Query of Pros and Cons of Bitcoin Opinion from Official Bodies

	A : Bank of England	B : Bank of Japan	C : Deutsche Bundesbank
1 : Anonymous Users in Payment System	1	0	1
2 : Does Not Meet the Criteria of Payment System	0	0	0
3 : High Volatility in Payment System	0	0	0
4 : Low Usage of Bitcoin to Pay Goods or Services	0	1	0
5 : No Central Bank for Bitcoin as Payment System	0	0	1
6 : No Legal Jurisdication as Payment System	0	0	0
7 : High Demand for Payment Instead Investment	0	0	0
8 : Payment System is User Friendly	1	0	0
9 : Substantial Technology Behind Bitcoin as Payment System	1	1	0
10 : Anonymous Users using Virtual Currency	1	1	1
11 : Does Not Meet the Criteria of Currency	0	0	0
12 : High Volatility as Virtual Currency	1	0	0
13 : No Central Bank for Bitcoin as Virtual Currency	1	2	1
14 : No Legal Jurisdication as Virtual Currency	0	1	0
15 : Substantial Technology Behind Bitcoin as Virtual Currency	1	2	0
16 : Transaction is User Friendly as Virtual Currency	1	0	0
17 : Inappropriate Practice	0	1	1
18 : Payment in Dark Markets	0	0	1
19 : Bitcoin is A Scam	0	0	0
20 : Can be Manipulated	1	1	1
21 : Easily Attacked by Cyber Fraud	1	2	1
22 : Involving Risk	1	1	1
23 : Can be Used to Prevent Fraud	0	0	0

	D : European Central Bank	E : FBI	F : Federal Reserve Bank
1 : Anonymous Users in Payment System	1	0	0
2 : Does Not Meet the Criteria of Payment System	3	0	0
3 : High Volatility in Payment System	1	0	0
4 : Low Usage of Bitcoin to Pay Goods or Services	1	0	1
5 : No Central Bank for Bitcoin as Payment System	1	0	1
6 : No Legal Jurisdication as Payment System	2	0	1
7 : High Demand for Payment Instead Investment	2	0	1
8 : Payment System is User Friendly	2	0	1
9 : Substantial Technology Behind Bitcoin as Payment System	2	0	1
10 : Anonymous Users using Virtual Currency	1	0	0
11 : Does Not Meet the Criteria of Currency	1	0	0
12 : High Volatility as Virtual Currency	3	0	0
13 : No Central Bank for Bitcoin as Virtual Currency	2	0	1
14 : No Legal Jurisdication as Virtual Currency	3	0	1
15 : Substantial Technology Behind Bitcoin as Virtual Currency	2	0	0
16 : Transaction is User Friendly as Virtual Currency	0	0	1
17 : Inappropriate Practice	3	1	0
18 : Payment in Dark Markets	2	0	1
19 : Bitcoin is A Scam	1	1	0
20 : Can be Manipulated	1	0	1
21 : Easily Attacked by Cyber Fraud	2	0	0
22 : Involving Risk	3	0	1
23 : Can be Used to Prevent Fraud	0	0	0

4.3.1. General Opinion of Bitcoin from Official Bodies

General opinions from official bodies are presented in this section. The general opinions will not include the fraudulent activities related to Bitcoin. Some of these general opinions are related to the reasons of fraudulent acts around Bitcoin. In additions, some of the opinions discuss the differences between Bitcoin, traditional payment system, and other payment systems already recognized by the official bodies.

The first part of this section is concerned with the general opinion of Bitcoin from official bodies related to the use of Bitcoin as a payment system. The second part discusses the general opinion of Bitcoin from official bodies related to Bitcoin as a virtual currency.

4.3.1.1. Pros of Bitcoin as Worldwide Payment System

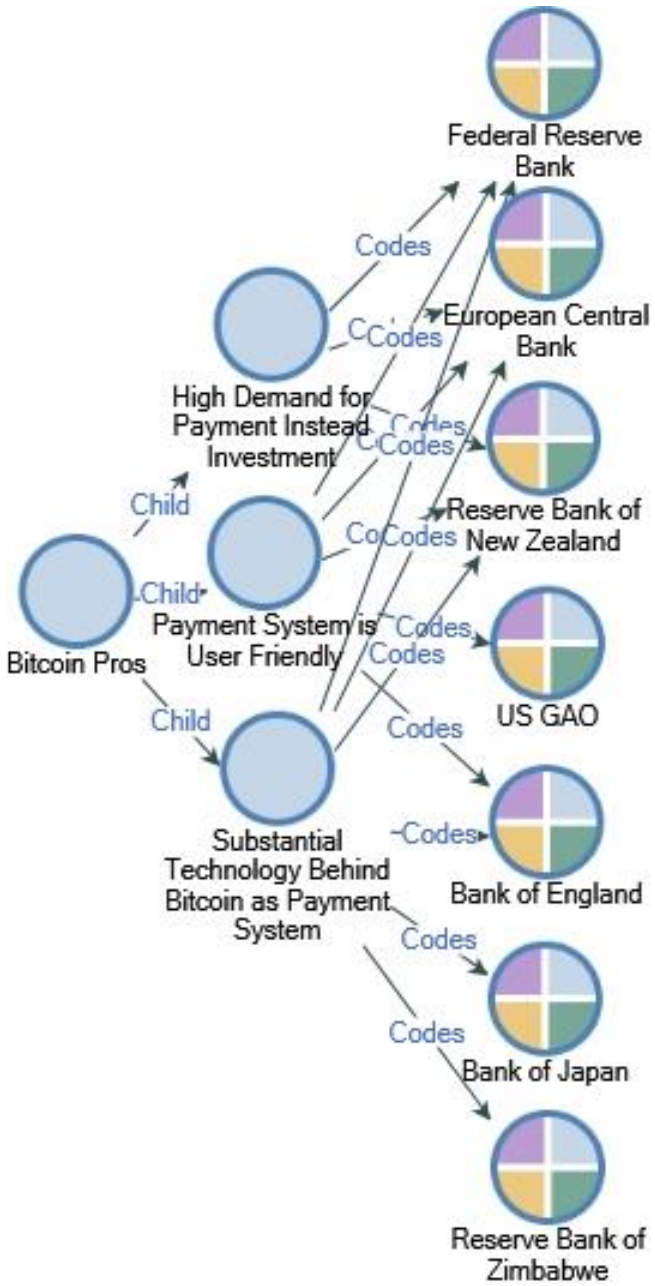
Figure 4.5 displays that the official bodies put forward their pro argument saying that Bitcoin has some positive advantages, especially for its users. The general statements related to the pros of Bitcoin as a payment system are Bitcoin's high demand is most likely for payment system instead of investment tool, payment system using Bitcoin is a user friendly, and the last one is Bitcoin has a substantial technology as a payment system behind it.

The pro opinion regarding Bitcoin as worldwide payment system will be discussed further in this section. According to the data displayed in figure 4.5, it was found out that almost all the official bodies have their own reason for their stance on Bitcoin as payment system. Figure 4.5 can be read using the matrix coding result in table 4.2. The official body which states many pro

opinions is European Central Bank, with the total of nine sources which voiced their opinions; two sources give opinions about Bitcoin has high demand of payment system instead of investment, five sources give opinions about Bitcoin is users friendly, and two sources give opinions about Bitcoin has substantial technology behind it. Meanwhile, as opposed to European Central Bank, Federal Bureau Investigation or FBI, does not have any statement regarding their pros towards Bitcoin as payment system.

Further discussion on the pros of Bitcoin as payment system will be discussed below, and we will know the reason why they stated each opinion regarding the statements.

Figure 4.5 Analytical Map of Pro Opinion on Bitcoin as Payment System from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher.

Table 4.2 Matrix Coding Query Based on Coded Source from Each Official Bodies and Pros Opinion of Bitcoin as Payment System

	A : High Demand for Payment Instead Investment	B : Payment System is User Friendly	C : Substantial Technology Behind Bitcoin as Payment System
1 : Bank of England	0	1	1
2 : Bank of Japan	0	0	2
3 : Deutsche Bundesbank	0	0	0
4 : European Central Bank	2	5	2
5 : FBI	0	0	0
6 : Federal Reserve Bank	4	1	2
7 : Reserve Bank of New Zealand	1	2	1
8 : Reserve Bank of Zimbabwe	0	0	1
9 : US GAO	0	1	0

Source: Data is processed with NVIVO 11 Plus by researcher.

Note: Matrix coding is generated based on source coded

4.3.1.1.1. Users Generally Use Bitcoin as a Payment Instead of Investment

When Bitcoin came into existence, it is accompanied with popularity of e-commerce system. Acting as the first digital currency, people have taken advantage of Bitcoin as payment method in online shopping world.

Years later, when the official bodies started to release their official report regarding the Bitcoin phenomenon, there are some official bodies which stated that it is true Bitcoin is more likely to be used as payment method rather than an investment. There are three official bodies which stated the same thing; European Central Bank, Federal Reserve Bank, and Reserve Bank of New Zealand, with the highest report sources is Federal Reserve Bank with four reports. Each of the official bodies had their own representative reports that include the statement.

Reserve Bank of New Zealand official report stated that Bitcoin is primarily used as one of payment method choices and also to store the value of Bitcoin (Bascand, 2014). Similarly, European Central Bank stated that Bitcoin payment system will give its users additional option to pay goods, as it has the efficiency that a user need (Draghi, 2016a). The allowance of Bitcoin to be used as one of payment methods is not separated from the wholesalers' role, by providing "Pay with Bitcoin" option for their customers (European Central Bank, 2015).

Badev and Chen (2014) from Federal Reserve Bank added another

point that there are total of 64.000 businesses around the world that accept Bitcoin as one of the payment methods. The number has proven that the motive of using Bitcoin is mainly due to payment motive, this has made Bitcoin have its value that originates from its role as a payment method (Badev & Chen, 2014).

4.3.1.1.2. Bitcoin is User Friendly as a Payment System

The high demand of payment system of Bitcoin rises with a reason—user-friendly payment method. There are five official bodies which stated that Bitcoin is user friendly as a payment method. Those official bodies are; Bank of England, European Central Bank, Federal Reserve Bank, Reserve Bank of New Zealand, and US Government Accountability Office, with the highest source reports is European Central Bank with five reports.

Ali, Barrdear, Clews, and Southgate (2014) from Bank of England and European Central Bank (2015) stated that Bitcoin has made payments between a cross-border payment—such as payment happens between two different currencies—and payments with different procedure are easily settled, especially for the startup business. Comparably with the statement above, Government Accountability Office (2014) underlined that what made Bitcoin is user friendly as a payment method, because it is used globally as a money transfer service across borders.

Furthermore, other reasons why Bitcoin is user friendly as a payment are Bitcoin can make money transfer instantly and fast compared

with traditional payment, and also it costs less than a traditional payment system—for example, there is no transfer fee when a transaction happens between two different banks (European Central Bank, 2012, 2015). Budding (2013) also added that the merchants who have chosen Bitcoin as a payment method, stated that Bitcoin offers a lower fee compared to credit cards as the payment method. Consequently, Badev and Chen (2014) said that the faster transactions Bitcoin make has facilitated straight transaction compared with traditional payment system.

Those reasons above are the opinions that can be predicted why the official bodies thought Bitcoin is a user friendly as a payment method. Unexpectedly, the researcher found out that the potential of Bitcoin to be used as a payment method without personal information attached in the transaction provides advantages for some users, as it would prevent information theft (European Central Bank, 2015). To sum up, with the advantages above, Bitcoin may cause rivalry with other traditional payment methods (Kumar & Smith, 2017).

4.3.1.1.3. Substantial Technology Behind Bitcoin as Payment System

The last opinion regarding the pro opinion on Bitcoin as a payment method is a substantial technology behind Bitcoin. Bank of England, Bank of Japan, European Central Bank, Federal Reserve Bank, Reserve Bank of New Zealand, and Reserve Bank of Zimbabwe already stated their opinions about the substantial technology that reclines behind Bitcoin, with the highest source of reports are Bank of Japan, European Central

Bank, and Federal Reserve Bank in which each of them had two reports.

The first technology that brings satisfaction for the Bitcoin users according to Ali et al. (2014) is when people use Bitcoin as a payment method, they do not need a central bank as their intermediaries. It mean the decentralized system of Bitcoin has advantages for the users to make payment. No central bank as intermediaries is also what make this system is user friendly. Moreover, Badev and Chen (2014) stated, another Bitcoin's technology is the distributed ledger system that Bitcoin has.

Kumar and Smith (2017) briefly concluded that what made Bitcoin is frequently used as a payment system is because the new information technology that recline behind Bitcoin has appeal to new customers to buy goods or use services from wholesalers. On top of that, Bank of Japan (2016) stated as the technology that reclines behind Bitcoin will gradually develop—which also means that there is more substantial technology that will emerge—there will be more range which is going to be covered by Bitcoin's technology. The last reason voiced by Reserve Bank of Zimbabwe (2015), which stated one of the innovation technology that is useful in Bitcoin as payment method is because of its *peer-to-peer* network.

4.3.1.2. Cons of Bitcoin as Worldwide Payment System

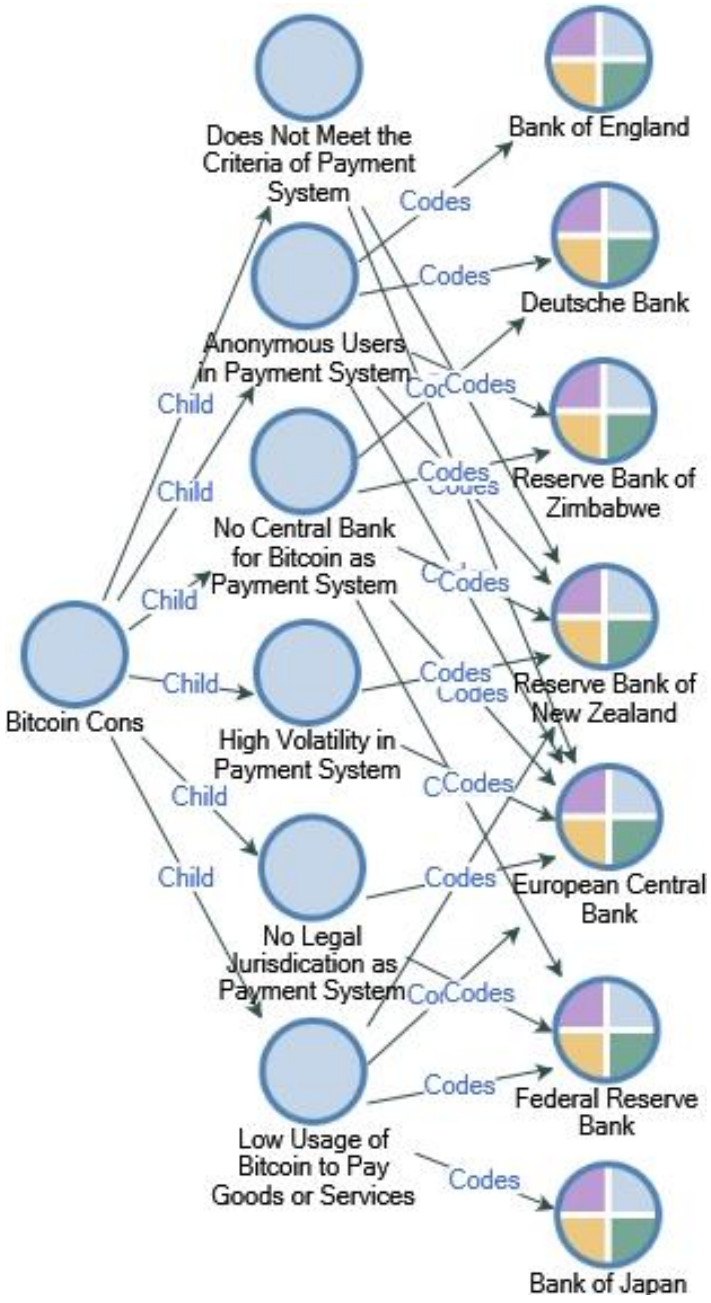
When there are pros related to Bitcoin which is used as worldwide payment system, the cons on the topic are also heard, surprisingly they are more than the pros.

The cons from general opinion of Bitcoin as worldwide payment system are as follows; Anonymous users of Bitcoin, Bitcoin which does not meet the criteria of payment system, high volatility which happen in Bitcoin, low usage of Bitcoin to pay goods or services, Bitcoin which does not have a central bank, and there is no legal jurisdiction which underline the Bitcoin as a payment method.

Briefly, as we can refer to the figure 4.6 which shows the map for con opinion on Bitcoin as a payment method, almost all the official bodies put forward cons. Fewer con opinion is expressed by Bank of England and Bank of Japan, with only one opinion each. Meanwhile, both Federal Bureau Investigation and US Government Accountability Office do not have any con opinion regarding Bitcoin as a worldwide payment system.

Furthermore, more detailed number of sources coming from each official body, were processed through the matrix coding query on table 4.3. Table 4.3 shows European Central Bank (ECB) voiced their opinion in every con opinion on Bitcoin as payment system, with the highest number of sources is in “Does not meet the criteria of payment system” opinion, and subsequently “No jurisdiction as payment system”. The deeper view with a further discussion will be presented in this section.

Figure 4.6 Analytical Map of Con Opinion on Bitcoin as Payment System from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher.

Table 4.3 Matrix Coding Query Based on Coded Source from Each Official Body and Con Opinion on Bitcoin as Payment System

	A : Anonymous Users in Payment System	B : Does Not Meet the Criteria of Payment System	C : High Volatility in Payment System	D : Low Usage of Bitcoin to Pay Goods or Services	E : No Central Bank for Bitcoin as Payment System	F : No Legal Jurisdication as Payment System
1 : Bank of England	1	0	0	0	0	0
2 : Bank of Japan	0	0	0	1	0	0
3 : Deutsche Bundesbank	1	0	0	0	1	0
4 : European Central Bank	1	3	1	1	1	2
5 : FBI	0	0	0	0	0	0
6 : Federal Reserve Bank	0	0	0	1	1	1
7 : Reserve Bank of New Zealand	1	1	1	3	1	0
8 : Reserve Bank of Zimbabwe	1	0	0	0	1	0
9 : US GAO	0	0	0	0	0	0

Source: Data is processed with NVIVO 11 Plus by researcher.

Note: Matrix coding is generated based on source coded

4.3.1.2.1. The Anonymity of Bitcoin's Users

The first con opinion that came out is the anonymity of users when they make a payment transaction using Bitcoin. In traditional payment system, it is prevalent for customers or shoppers to know who is transacting with them. The incapability of Bitcoin in detecting the partner—in this case, the customer or the seller involved in the payment system—the safety of Bitcoin is being questioned. Bank of England, Deutsche Bundesbank, European Central Bank, Reserve Bank of New Zealand, and Reserve Bank of Zimbabwe with each of the official bodies have one source of report.

European Central Bank (2015) defined that there is a "Know your customer" requirement which is important for sellers when completing transaction. Yet, currently Bitcoin system has no accountability of its users—even if they have the accountability, it will be in minor amount. Ali et al. (2014) stated that it is impossible to make a general agreement between the seller and the payer if they do not know each other. In other words, they will feel perceive the transaction that they will make to be higher risk. For example, when online shopping scams occur, it will likely difficult to investigate (Deutsche Bundesbank, 2017b). In addition, Kumar and Smith (2017) specified that the anonymity of Bitcoin users has been used by criminals in Silk Road, a black market where any kind of illicit transactions happen. Last illicit activity which result from anonymous user voiced by Reserve Bank of Zimbabwe (2015), stated the criminals

using Bitcoin to commit crime because it would harder for the law enforcement agency to track down who used the Bitcoin to do the illicit activities.

4.3.1.2.2. Bitcoin Does Not Meet the Criteria of Payment System

Even though Bitcoin user's community use Bitcoin as a payment method to pay goods or services and they contend that it is suitable with the current situation of technology, some of the official bodies state their con opinion about it. When it is compared with traditional payment system, they contend that Bitcoin does not meet the criteria of payment system. The official bodies which voiced the opinion are European Central Bank and Reserve Bank of New Zealand, with the highest source of reports is New Zealand with three sources.

European Central Bank (2015) informed that in Finland, the Bank of Finland which is Finland's central bank stated that Bitcoin and other virtual currencies do not justify the criteria of payment method. More strictly, European Central Bank also stated that Bitcoin officially not a payment method. European Central Bank (2012) stated in their report that there are some of payment method "Core Principles"—which have been fulfilled by the traditional payment system—but it is not fulfilled by the Bitcoin. Core Principles stated by European Central Bank (2012) include; clear understanding of risk for the users, the security level of the payment method, and the governance arrangements. Thus Bitcoin is not categorized as payment method in "Payment Service Directives".

A further note specified by Bascand (2014), the reason why Bitcoin does not meet the criteria of payment system is because the value of Bitcoin is still in short supply. Thus, it is impossible for Bitcoin to be used as payment method. Even though it does not meet the criteria of payment method, Bascand (2014) stated that it would be still possible for Bitcoin to be used as an investment instrument.

4.3.1.2.3. The Volatility of Bitcoin is Relatively High as a Payment System

Another con opinion is high volatility of Bitcoin. The official bodies which voiced this opinion are European Central Bank and Reserve Bank of New Zealand. High volatility of Bitcoin, according to some of official bodies also become a reason why it is impossible for Bitcoin to be used as a payment instrument. High volatility itself refers to the ups and downs of currency rates in market. European Central Bank (2015) stated that it is almost possible for Bitcoin to be a payment instrument since the volatility is high. In fact, there are business who have used Bitcoin as payment instrument by converting traditional currency into Bitcoin. Thus, the wholesaler will not accept the impact of the high volatility of Bitcoin.

Related to the con opinion stating that Bitcoin does not meet criteria of payment system, Bascand (2014) stated another reason why Bitcoin does not meet the criteria of payment system. It is because the Bitcoin's value rises and falls irregularly in great number of amounts. In other words, Bitcoin has high volatility. This high volatility as payment

system has made the users vulnerable (European Central Bank, 2015)

4.3.1.2.4. Low Usage of Bitcoin to Pay Goods or Services

Low usage of Bitcoin to pay goods or services opinion had been voiced by Bank of Japan, European Central Bank, Federal Reserve Bank; and the highest coded source was Reserve Bank of New Zealand with three sources. Now when we look at the previous con opinion related to Bitcoin as payment system, in section "Does not meet the criteria of payment system", Bascand (2014) stated that it would be useful for if people use Bitcoin as investment tool rather than a payment tool. This statement is most likely for a reason; even though people expect Bitcoin is very usable as payment method, from the opinion of official bodies which has been analyzed, the use of Bitcoin as a payment method is lower than they expected.

Bank of Japan (2016) stated that Bitcoin will most likely be used as an investment tool, rather than the tool to pay goods and services. Badev and Chen (2014) concisely stated that, "Bitcoin is still barely used for payments for goods and services" (p. 27). Additionally, Fujii-Rajani (2018) specified that the reason why the expectation on "Bitcoin is widely used as payment system" arose is because the Bitcoin itself might be used as a payment system, but the fact reveals it is only for commodity, not for payment system. As a result of the previous phenomenon, Bitcoin has few payment transaction (Kumar & Smith, 2017).

Furthermore, Budding (2013) also explained that another reason

why the use of Bitcoin as payment instrument did not bring a further step to the innovation of payment system, it was because people who have the Bitcoin in their wallet, did not actually use it to pay something. They only keep the Bitcoin in their wallet and do nothing with them.

4.3.1.2.5. The Absence of Central Bank and Legal Jurisdiction to Control Bitcoin as Payment System

The absence of central bank for Bitcoin opinion has been voiced by Deutsche Bundesbank, European Central Bank, Federal Reserve Bank, Reserve Bank of New Zealand, and Reserve Bank of Zimbabwe. A central bank is an essential thing for a currency in a country. Every traditional payment is controlled by central bank. Contrast to the traditional payments, Bitcoin—which is speculated as a new payment system in financial world—does not have a central bank as an intermediary between transactions (Badev & Chen, 2014).

When there is no central bank as an intermediary between transactions using Bitcoin, it means that Bitcoin is likely to be an object for a central bank to be suspected (European Central Bank, 2015). The absence of central bank to regulate Bitcoin as payment system, paves the way for black market to pay everything illegal (Kumar & Smith, 2017). Similarly, Reserve Bank of Zimbabwe (2015) stated the absence of central bank resulted in illegal activities such as drugs, smuggling, and money laundering to be happened freely.

In the future if this problem is not solved, there will be many

questions on why Bitcoin cannot bring a safe and secure payment transaction, and whether—if this situation is still going on—it can process a large transaction securely or not (Deutsche Bundesbank, 2017b).

Meanwhile for the absence of legal jurisdiction, there are two official bodies which voiced their opinion related to "No legal Jurisdiction". Those official bodies are European Central Bank and Federal Reserve Bank. No legal jurisdiction is one of the popular con opinion. It has a strong correlation with "No central bank for Bitcoin". Usually, when there is no central bank as the intermediary, it will automatically provide an uncertainty whether it is legally accepted or not.

Badev and Chen (2014) further explained that Bitcoin does not have any legal jurisdiction at a given time. Under the European Union law, the absence of legal jurisdiction in Bitcoin means that the users are not protected by the law, and if anything happens with the transaction, the European Union will not give any refund rights (European Central Bank, 2015).

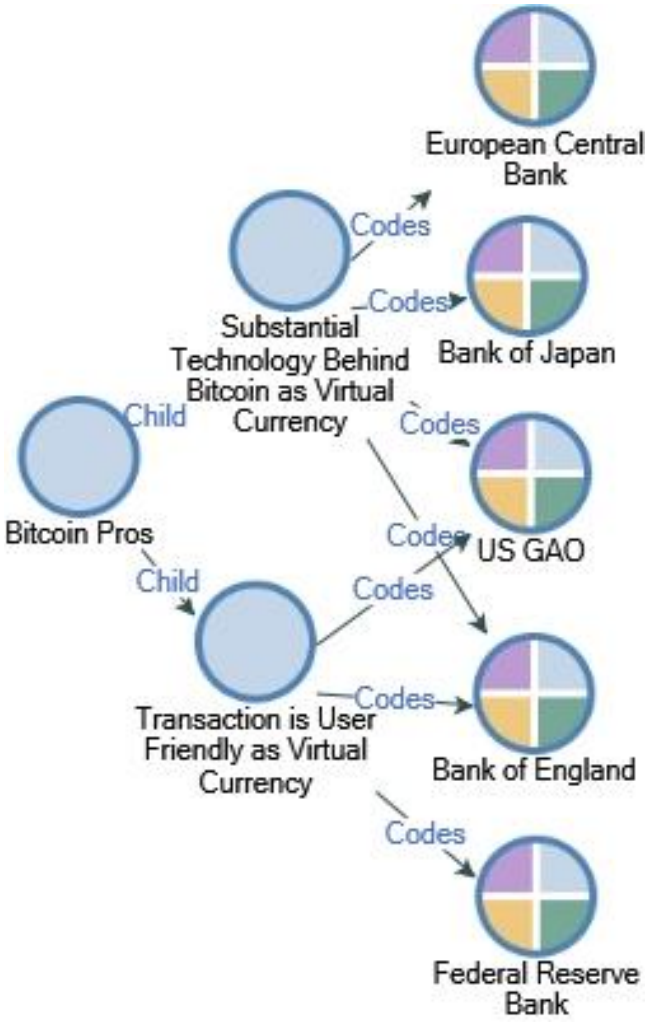
Moreover, a further explanation regarding the lack of jurisdiction is described by European Central Bank (2012), clear difference between Bitcoin as a payment method and the other traditional payment method is the lack of legal jurisdiction. The lack of legal jurisdiction includes no clear rights and obligations for the users and other parties. Additionally, the lack of legal jurisdiction will place the users at greater risk, for example cybercrime which is illegally committed by the scammers,

fraudsters, and money launderers.

4.3.1.3. Pros of Bitcoin as Worldwide Virtual Currency

After we discussed the general opinion regarding Bitcoin as worldwide payment system, we are going to discuss the official bodies' opinion of Bitcoin as a worldwide virtual currency. The first one is the opinions which are pros to the Bitcoin as virtual currency. In general, it was found out that there are two opinions which are pros of the innovation of Bitcoin as new virtual currency in financial system—Bitcoin as virtual currency has some substantial technologies as a currency behind it and the friendly transaction that Bitcoin has when users want to make any transaction. The pro opinions that official bodies already stated regarding Bitcoin as a worldwide virtual currency above will be discussed further in this section.

Figure 4.7 Analytical Map of Pros Opinion on Bitcoin as Virtual Currency from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher.

Table 4.4 Matrix Coding Query Based on Coded Source from Each Official Bodies and Pro Opinion on Bitcoin as Virtual Currency

	A : Substantial Technology Behind Bitcoin as Virtual Currency	B : Transaction is User Friendly as Virtual Currency
1 : Bank of England	1	1
2 : Bank of Japan	2	0
3 : Deutsche Bundesbank	0	0
4 : European Central Bank	2	0
5 : FBI	0	0
6 : Federal Reserve Bank	0	1
7 : Reserve Bank of New Zealand	0	0
8 : Reserve Bank of Zimbabwe	0	0
9 : US GAO	1	1

Source: Data is processed with NVIVO 11 Plus by researcher.

Note: Matrix coding is generated based on source coded

From the table 4.4 above, there are some detailed things related to the sources that each official body has regarding pro opinion on Bitcoin as a virtual currency. Bank of England and US Government Accountability Office (GAO) mainly only have one source of report in each opinion, but their report represents two opinions related to this section. Meanwhile, even though both European Central Bank and Bank of Japan topped the source of reports with two sources each, their sources only represent one opinion. A detailed discussion will be discussed after this section.

4.3.1.3.1. Substantial Technology Behind Bitcoin has Made It A 'User Friendly' to be A Virtual Currency

The invention of Bitcoin as a new technology called digital currency in financial system, undoubtedly has attracted the official bodies to discuss its advantages and how the technology gives new light to the

future. The official bodies which voiced this opinion are Bank of England, Bank of Japan, European Central Bank, and US GAO. One of the substantial technologies behind Bitcoin as a currency that some of official bodies discuss is the distributed ledger a Bitcoin technology has (Ali et al., 2014; Bank of Japan, 2016a, 2016b). The distributed ledger of Bitcoin is the most substantial invention, and it could be an endeavor to make Bitcoin and distributed ledger technology as "Internet of Finance" (Ali et al., 2014).

Moreover, Bank of Japan (2016a, p.29) described the advantages of distributed ledger in Bitcoin, one of which is to, "enhance economic welfare and revitalize economic activities", as any transaction using Bitcoin can be easier such as payment system and service improvement. In addition, Bank of Japan (2016b) also stated with distributed ledger, it could help Bitcoin in managing an enormous amount of transactions happen at once, that is which in turn will make Bitcoin better than the other currency. Also this distributed ledger of Bitcoin will improve to the wider area of finance system.

European Central Bank (2015) stated one of the advantages of Bitcoin as virtual currency is that it brings convenience if it is applied as one of payment method options; it is categorized as constructive financial invention. Another pro opinion related to Bitcoin as virtual currency is described by Government Accountability Office (2014), which discusses the cost and speed of transaction using Bitcoin as a virtual currency—

transaction using Bitcoin cost less and save time since Bitcoin does not need an intermediary bank to process the transactions. Consequently, by floating times in transactions can be minimized which in turn revenue can be obtained (European Central Bank, 2012).

The emergence of Bitcoin as a virtual currency has made transactions using Bitcoin is user friendly. This has also had been voiced by Bank of England, Federal Reserve Bank, and US GAO. Because of the decentralized system that a Bitcoin has, Bitcoin offers efficiency as it does not have intermediary bank that can make it to be a centralized system (Ali et al., 2014). In addition, the decentralized ledger makes transactions publicly known and it will automatically provide a general agreement between the Bitcoin users involved in the transactions (Badev & Chen, 2014).

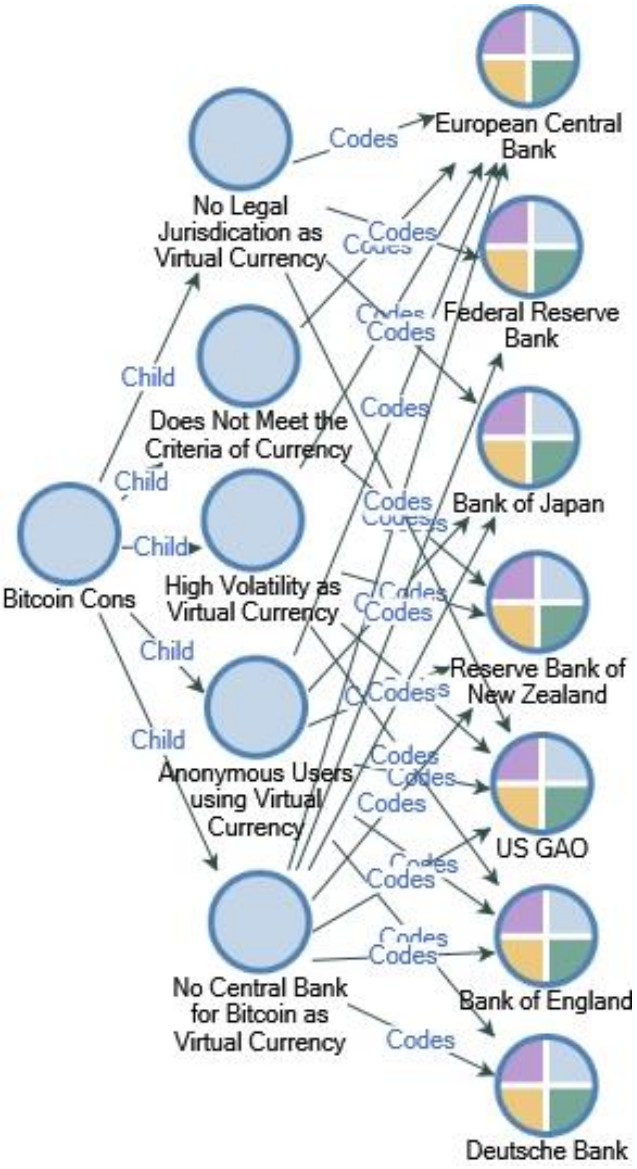
Moreover, another reason why the unavailability of intermediary bank has made transactions user friendly because Bitcoin can only be accessed from internet. It is actually a user friendly as users only need internet access in order to make a transaction without any access to conventional financial system (Government Accountability Office, 2014).

4.3.1.4. Cons of Bitcoin as Worldwide Virtual Currency

Similar with the cons of opinion on Bitcoin as a worldwide payment system, the con opinion on Bitcoin as a worldwide virtual currency is also higher compared with pro opinions. The cons are also discussing similar things with Bitcoin as payment system. The discussion encompasses

anonymous users when using Bitcoin as a virtual currency, Bitcoin does not meet the criteria to be called as “Currency”; high volatility of Bitcoin that can happen anytime; there is no central bank for Bitcoin as a currency, and the last one is there is no legal jurisdiction which clearly states Bitcoin is one of the kinds of legal currency. The opinions against Bitcoin as worldwide virtual currency above will be discussed further in this section.

Figure 4.8 Analytical Map of Con Opinion on Bitcoin as Virtual Currency from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher

Table 4.5 Matrix Coding Query Based on Coded Source from Each Official Bodies and Con Opinion on Bitcoin as Virtual Currency

	A : Anonymous Users using Virtual Currency	B : Does Not Meet the Criteria of Currency	C : High Volatility as Virtual Currency	D : No Central Bank for Bitcoin as Virtual Currency	E : No Legal Jurisdication as Virtual Currency
1 : Bank of England	1	0	1	1	0
2 : Bank of Japan	1	0	0	2	1
3 : Deutsche Bundesbank	1	0	0	1	0
4 : European Central Bank	1	1	3	2	3
5 : FBI	0	0	0	0	0
6 : Federal Reserve Bank	0	0	0	1	1
7 : Reserve Bank of New Zealand	1	2	2	1	1
8 : Reserve Bank of Zimbabwe	0	0	0	0	0
9 : US GAO	1	0	1	1	1

Source: Data is processed with NVIVO 11 Plus by researcher

Note: Matrix coding is generated based on source coded

From the table 4.5 about the matrix coding query based on source coded, both European Central Bank and Reserve Bank of New Zealand voiced their opinions against Bitcoin as a virtual currency. More specifically, European Central Bank also voiced their opinion with a total three sources in "High volatility as a virtual currency" and "No legal jurisdiction as a virtual currency".

4.3.1.4.1. The Distinctions Between Bitcoin as a Virtual Currency and Other Traditional Currency

1. Bitcoin Users are Not Obliged to Reveal Their Real Identities

Anonymous users seem to be one of the arguments against the opinions on Bitcoin as virtual currency. Table 4.5 shows almost all of the official bodies voiced their opinion, except the Federal Bureau Investigation (FBI) and Federal Reserve Bank. Bitcoin users are anonymous because they do not have to reveal identity (Ali et al., 2014). Consequently, there will be less trust among the users, whereas trust between users is a significant thing for Bitcoin in order to be accepted as a currency (Nakaso, 2016).

The anonymity of users itself is a typical element, even a characteristic of a virtual currency. In the case of Bitcoin which the users are not mandatory to transact under their actual name, they are occasionally provided with a degree of anonymity (Deutsche Bundesbank, 2017a; Government Accountability Office, 2014; Kumar & Smith, 2017). The involvement of anonymous user's identity will make it hard to track

down the transaction using Bitcoin. So when a user is involved in a scam activity, it will be hard for him or her to know who he or she is dealing with because there is no transparency about it (European Central Bank, 2015). The unavailability of transparent Bitcoin user's identity, put the users at risk because they will have difficulty getting legal protection (Government Accountability Office, 2014).

2. Bitcoin Does Not Meet the Criteria of Currency

Table 4.5 displays European Central Bank and Reserve Bank of New Zealand seem to agree with the opinion on Bitcoin does not meet the criteria of currency. Bitcoin is usually called as "virtual currency", but it does not meet the criteria to be a currency at all. European Central Bank (2015) stated that a few countries have banned the activities involving Bitcoin, as they stated that legally Bitcoin is not a currency. Further, European Central Bank explained what the countries, mostly in Europe, stated about Bitcoin; In Sweden, Bitcoin is in fact not a currency and it is close to be called as an "asset" instead. To be called as a currency, Bitcoin must be controlled under central bank in some geographic areas; In Germany, the German Ministry of Finance stated instead of a currency Bitcoin is just a unit of account, and not qualified as a financial instrument; In Denmark, they stated that Bitcoin is not a currency since Bitcoin does not have a trading value, even if it is compared to silver or gold.

In addition, Kumar and Smith (2017) also stated that in Australia, The Australian Tax Office proclaimed a Bitcoin cannot be classified as

currency, instead as an asset for capital gain tax and any business using Bitcoin will be treated as barter arrangements. Lastly, Reserve Bank of New Zealand stated that Bitcoin does not meet the criteria of currency, since it is more likely meet the criteria of commodity than a virtual currency (Spencer, 2014).

3. The Volatility of Bitcoin is Relatively High as a Virtual Currency

As we can see from table 4.5, according to the Bank of Japan, European Central Bank, Reserve Bank of New Zealand and US. GAO, they stated that high volatility is against Bitcoin as a virtual currency. Ali et al. (2014) explained that the high volatility of Bitcoin, have stimulated a lot of discussion. Draghi (2016) explained a statement from European Central Bank (ECB) that Bitcoin's volatility is considered higher than the that of traditional currency—a currency that is under the authority of central bank. Government Accountability Office (2014, p.22) explained the volatility of Bitcoin itself refers to price of Bitcoin, "can change quickly and dramatically".

Further, European Central Bank (2015) gave an example of how the volatility happens in Bitcoin as a virtual currency; a Bitcoin's price exchange can be more than 10%, and then in less than 24 hours the price exchange rises more than 100%, and many more example of how the volatility of Bitcoin could increase and decrease drastically. Because of this high volatility, Bitcoin is more suitable as an investment than as a unit of account. Meanwhile, European Central Bank (2012) described this

phenomenon happened because of the demand and supply. And this made Bitcoin as a defective place to store value because the volatility is higher than the original traditional currency (Kumar & Smith, 2017).

4.3.1.4.2. The Absence of Central Bank and Legal Jurisdiction to Control Bitcoin as Virtual Currency

The absence of central bank for Bitcoin seems to be a well-known information for the people who acknowledge Bitcoin. This issue also becomes a central concern for the official bodies since there are many opinions regarding this issue. From table 4.5, the official bodies stated the same opinion except for Federal Bureau Investigation. The first opinion comes from Ali et al. (2014) who stated that when users want to make transactions with Bitcoin, they did not need a central bank as an intermediary. It means that there is no central bank, or any other official financial institution that act as an intermediary between users (Badev & Chen, 2014).

Moreover, European Central Bank (2015) explained that Bitcoin is not classified as a legal currency since it is not regulated by government monetary authority such as central bank, credit institution or e-money institution. European Central Bank (2012) claimed that unavailability of central bank or any other official financial institution behind Bitcoin as a virtual currency will affect the trust that a Bitcoin gains with the Bitcoin's issuer. In addition, since the absence of central bank, Bitcoin will not receive same treatment as the traditional currencies; in this case Bitcoin

dominates its own units (Kumar & Smith, 2017).

Other deficiencies that Bitcoin will face due to the absence of central bank is; first, if there is any fraud or any kind of suspicious transaction using Bitcoin, it will be hard for the law enforcement institution such as Federal Bureau Investigation (FBI) to track down the transaction and find the culprit; the second, if a business suffers from losses there will be no particular customer protection to cover the loses (Government Accountability Office, 2014).

No legal jurisdiction also becomes a concern for Bank of Japan, European Central Bank, Federal Reserve Bank, Reserve Bank of New Zealand, and US. GAO. The reason why Bitcoin and any other currencies have no legal jurisdiction used to be their foundation to innovate, because they are mainly issued by the non-official financial institutions (Bank of Japan, 2016b). Since there is no legal jurisdiction, ECB and GAO clearly categorize Bitcoin as an illegal currency in the world, following some of the countries who already defined the legal status of Bitcoin (Draghi, 2016a; Government Accountability Office, 2016). European Central Bank (2015) also stated that, not only "Bitcoin is not widely used as currency and not a legal money or currency", but also it is unclear who will control Bitcoin since there is no legal jurisdiction. Thus, the risk of Bitcoin for its users remain exists. This greater risk was also voiced by Fujii-Rajani (2018).

Similarly, Badev and Chen (2014) also claimed that Bitcoin does

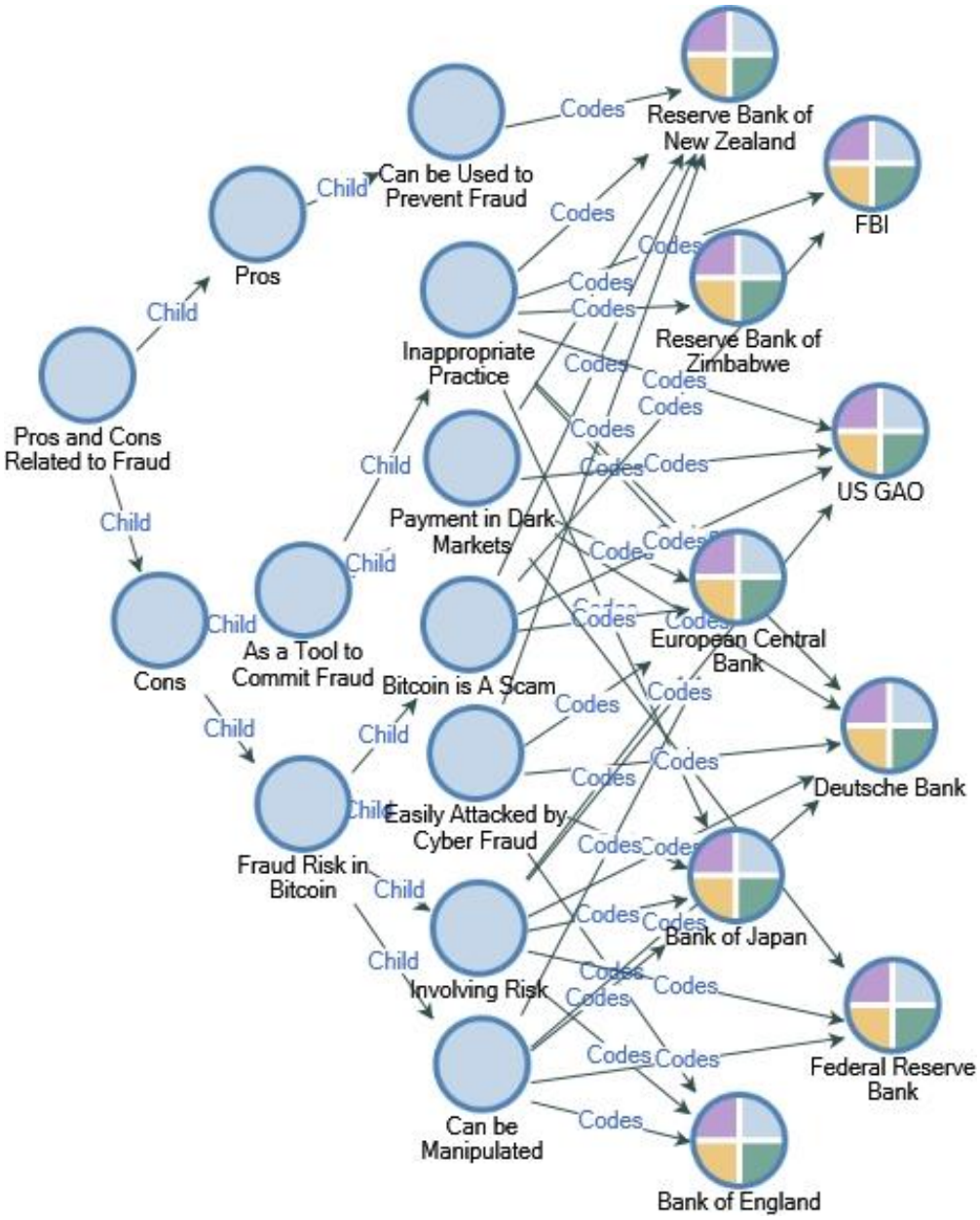
not have any legal tender status in the current law. Under such circumstances, it would be difficult for Bitcoin to prepare legal document, in order to be accepted by the regulatory law (Fujii-Rajani, 2018).

4.3.2. Fraud Related Opinion of Bitcoin from Official Bodies

When Bitcoin came into existence, people started to question whether this innovation would bring risks to the financial system. It turns out that it has some deficiencies if we compare it to the traditional financial system regulation. And the deficiencies have some negative impacts on the financial system. For example, it has been used as a tool to commit cybercrime. However, there are official bodies who stated that Bitcoin has some advantages to prevent fraud.

As we can see from table 4.6 below, European Central Bank (ECB) voiced their opinion in any kind of opinion on Bitcoin related to fraud activities. They only did not voice their opinion on "Can be used to prevent fraud" opinion, meaning that if it is already related to fraud, they did not give any pro opinion about Bitcoin. Reserve Bank of New Zealand also seems to have opinions in almost every kind of opinion, except "Can be manipulated" opinion and "Involving risk" opinion. Further detailed finding informs that Reserve Bank of New Zealand is the only official body which voiced pro opinions on Bitcoin related to Fraud.

Figure 4.9 Analytical Map of Bitcoin's Fraud-related Opinion from Official Bodies



Source: Data is processed with NVIVO 11 Plus by researcher

Table 4.6 Matrix Coding Query Based on Coded Source from Each Official Body and Fraud Related Opinion

	A : Inappropriate Practice	B : Payment in Dark Markets	C : Bitcoin is A Scam	D : Can be Manipulated	E : Easily Attacked by Cyber Fraud	F : Involving Risk	G : Can be Used to Prevent Fraud
1 : Bank of England	0	0	0	1	1	1	0
2 : Bank of Japan	1	0	0	1	2	1	0
3 : Deutsche Bank	1	1	0	1	1	1	0
4 : European Central Bank	3	2	1	1	2	3	0
5 : FBI	1	0	1	0	0	0	0
6 : Federal Reserve Bank	0	1	0	1	0	1	0
7 : Reserve Bank of New Zealand	3	2	2	0	2	0	2
8 : Reserve Bank of Zimbabwe	1	0	0	0	0	0	0
9 : US GAO	2	1	1	0	0	1	0

Source: Data is processed with NVIVO 11 Plus by researcher

Note: Matrix coding is generated based on source coded

4.3.2.1. Pro Opinions on Bitcoin from Official Bodies

The opinion that came out related to fraud in Bitcoin, it did not always mean that everything related to fraud action or any illicit action is committed by criminals. Rather, it could be some positive effect that is derived by the usage of Bitcoin. Here in this section, the official bodies stated their opinion related to the pro opinion on Bitcoin in relation to fraud activities.

4.3.2.1.1. Bitcoin's Technology Can be Implemented to Prevent Fraud

Surprisingly, with numerous con opinions on reasons of why fraud happens in the usa of Bitcoin, some of the official bodies are come up with the idea of positive effect on Bitcoin. The one and only idea is "Bitcoin can be used to prevent fraud", which can be seen on table 4.6 that Reserve Bank of New Zealand is the only official body put forward this idea.

Fujii-Rajani (2018) explained that the technology behind Bitcoin, which is called "blockchain" can be used to prevent fraud in insurance company. In this case blockchain technology allows the user to share information regarding the insurance transaction that is already done.

Another example is provided by Kumar and Smith (2017), in Bitcoin's technology there is a technology called cryptography in the distributed ledger, so people will commit some embezzlement to their Bitcoin balances. Additionally, another example is when people is having a transaction in Bitcoin, they cannot turn over the transaction as what usually happens with the credit card transaction; fraud happens when the customers suddenly turn over their transaction using credit card after

receiving the goods or services from the seller. Thus that technology can be used to prevent fraud (Kumar & Smith, 2017).

4.3.2.2. Con Opinion on Bitcoin from Official Bodies

There are six con opinions related to fraud. These will be divided into two section; Bitcoin as a tool to commit fraud, and the potential fraud risk in Bitcoin.

4.3.2.2.1. Fraudsters Take Advantage of Bitcoin as an Instrument to Commit Fraud

The shortcomings of Bitcoin have been discussed before, both as payment system and virtual currencies. There is no doubt that fraudsters will use it as a tool to commit fraud. The following is the ways to commit fraud, based on the statement of official bodies.

1. Bitcoin Used to Commit Inappropriate Practice

Inappropriate practice might be the most popular way on what people do with Bitcoin, as almost all official bodies voiced some opinion about this, except Bank of England and Federal Reserve Bank. The first official body is Bank of Japan. Nakaso (2016) gave an example of inappropriate practice done using Bitcoin; it was stated that the failure of Mt.Gox—the biggest Bitcoin exchange in Japan in 2014, was because the third party manipulated the distributed ledger system, and stole the Bitcoin from Mt.Gox, that Mt.Gox suffered the bankruptcy.

The second official body is from Deutsche Bundesbank. Deutsche Bundesbank (2017b) stated that the habits of virtual currency such as

Bitcoin, will give criminals an opportunity intentionally to commit crime.

The third official body is from European Central Bank. Draghi (2016) explained that the anonymity of users on Bitcoin, gives fraudsters and other criminals an opportunity to transfer money via virtual currency freely without fear of getting caught. Similarly, in virtual currency schemes, money laundering and financial crimes are be the main fraud which most likely happen, additionally the mining manipulation was constantly to be one of main problems to face when people use Bitcoin. Such manipulation usually happens in investment fraud because there is no transparency of the users (European Central Bank, 2015). Furthermore, European Central Bank (2012) also added that the anonymity of users will cause a money-laundering system. And the last, lack of legal jurisdiction may give criminals and fraudster opportunity to commit illegal activities.

The fourth official body is Federal Bureau Investigation. Federal Bureau of Investigation (2016) briefly stated that Bitcoin can be a tool to collect ransomware payments, with CryptoWall as the provider of ransom payments using Bitcoin.

Similarly, Reserve Bank of Zimbabwe (2015) explained that the use of Bitcoins as ransom by the criminals is to steal the confidential information of the official bodies and government. In addition, they stated that Bitcoin usually is use as the tools to commit money laundering by the fraudsters (Reserve Bank of Zimbabwe, 2015)

Furthermore, Budding (2013) from Reserve Bank of New Zealand

stated that Bitcoin is a subject of law enforcement agency because many criminals use it as tools to commit cyber-crime activities. Fujii-Rajani (2018) added that due to money laundering activities which involved Bitcoin, banks immediately closed the accounts involved in the money laundering activities. Moreover, Kumar and Smith (2017) further explained that anonymity and lack of legal jurisdiction are the most reason why money laundering and illegal transaction occur, such as in gambling commodity more than 60% of the Bitcoin holders, use Bitcoin as their transaction tool.

The last official body which stated Bitcoin as their tool to commit fraud is US. Government Accountability Office. Government Accountability Office (2016) stated similarly that money laundering specifically has become the most common type of fraud committed by fraudster using Bitcoin.

2. Bitcoin to be Used as Payment in Dark Market

When we discussing dark market, it is frequently associated with any illegal activities such as drug trafficking, illegal weapons and many kinds of illegal things. From the table 4.6, Deutsche Bundesbank, European Central Bank, Federal Reserve Bank, Reserve Bank of New Zealand, and US GAO voiced this opinion.

In a similar way, Deutsche Bundesbank, European Central Bank, Federal Reserve Bank, US GAO, and Reserve Bank of New Zealand stated that Bitcoin is mainly used as payment in online gambling site such

Satoshi Dice, online black market such as Silk Road— places where they usually shop illicit drug and other illegal goods—the fact that Bitcoin has all characteristics which the cybercriminals had wished started to be connected to ransomware (Badev & Chen, 2014; Budding, 2013; Deutsche Bundesbank, 2017b; Draghi, 2016a; European Central Bank, 2012; Government Accountability Office, 2014; Kumar & Smith, 2017)

4.3.2.2.2. The Presence of Fraud Risk in Bitcoin

Fraud risk in Bitcoin occurs when people use Bitcoin as a tool to commit fraud. Fraud which used to be prevalent in traditional currencies, has begun to spread to the use of Bitcoin. Consequently, it puts people who want to invest in Bitcoin or use Bitcoin as payment method, in jeopardy.

1. Bitcoin is Used to Defraud People in Scam Activities

In summary, there are four official bodies that stated Bitcoin is a kind of scam because fraudsters frequently use Bitcoin to defraud their victims. The four official bodies are; European Central Bank, Federal Bureau Investigation, Reserve Bank of New Zealand, and US GAO. Those official bodies stated in a similar way that type of scam activities the fraudster committed to defraud people are in scope of investment and payment (Budding, 2013; European Central Bank, 2015; Federal Bureau of Investigation, 2014; Fujii-Rajani, 2018; Government Accountability Office, 2014). In payment for example, a fraudster acted as a seller when a buyer has bought goods from the fraudster and paid with Bitcoin, they

did not receive their goods. Or the fraudster acted as a buyer and when they already got their goods, they did not send the Bitcoin to the seller (European Central Bank, 2015).

The next scam happens when users invest in Bitcoin The scheme of doing investment scam with Bitcoin is similar with that of payment scam with Bitcoin. According to Government Accountability Office (2014), there was once an investment fraud using Bitcoin with a similar scheme of Ponzi scheme—where the fraudster promised a high return to investors, only to steal their money and pay the money to the old investor—which offered a high return percentage of Bitcoin they invested, stole the Bitcoin, and pay the stolen Bitcoin to the old investors in the amount of return the fraudster had promised.

Moreover, Federal Bureau Investigation stated in their annual official report about the scam activity that happened using Bitcoin. After the Bitcoin users successfully did the mathematical computations and gave a high performance in order to mine the Bitcoins, the Bitcoin provider—a fraudster—did their scam activity by not giving the users (the victims) the promised Bitcoin amount after the users paid for it (Federal Bureau of Investigation, 2014). Additionally, Fujii-Rajani (2018) reported that other example of Bitcoin used by preparators to commit scam activity was; first when they offered Bitcoin to the victims and the victims started to mine the Bitcoin from their computers, the scammers started to steal the data in that computer; second when the scammer infected the victim's

computer's system by installing the Bitcoin mining system and used the victim's system to mine Bitcoin for their own advantage.

2. The Manipulation in Bitcoin Resulting from Anonymity of its Users

Fraudsters seem to benefit from the anonymity of users, because it gives them an opportunity to commit illegal activities. European Central Bank, (2015) reported that the fraud happened in Bitcoin as payment and as investment. Other official bodies also supported this fact by stating that anonymity of users and lack of transparency between them is the reason for fraud cases in Bitcoin (Ali et al., 2014; Badev & Chen, 2014; Deutsche Bundesbank, 2017a; Nakaso, 2016).

3. Bitcoin System Could be Easily Attacked by Cybercrime

The advantage of Bitcoin that can be operated via internet, has given it an opportunity to be an easy target for criminals to commit illegals activity. Almost all of the official bodies stated this except Federal Bureau Investigation, Federal Reserve Bank, and US GAO. Ali et al. (2014) stated that the Bitcoin system is a target of wide risk fraud. Meanwhile, Bank of Japan (2016b) stated that when Bitcoin is more widely used as a virtual currency, they might be more vulnerable to cyberattack and hacking. Therefore, Deutsche Bundesbank (2017b) explained that a good system to protect it from criminals is the most important thing. Unless the cyberattack in Bitcoin may result in either individual forfeiture or forfeiture on wider area (European Central Bank, 2015). The attack itself

usually in a form of cyberattack ransomware or the monopoly on Bitcoin mining, and it is going to be more vulnerable if a single Bitcoin provider handles many system at once (European Central Bank, 2015; Fujii-Rajani, 2018). By these cybercrimes that roam on Bitcoin system, both of the providers and the miners of Bitcoin are vulnerable to Fraud (Kumar & Smith, 2017).

4. Bitcoin is Vulnerable to Fraud Risk

As discussed before, those who have higher vulnerability to fraud are people using Bitcoin for payment or investment tool. The fact that Bitcoin is operated through internet, is another great risk yet the prevention of fraud is not fully examined (Ali et al., 2014; Bank of Japan, 2016a; Draghi, 2016b). As such, the Bitcoin users must trust their own instinct in deciding who they are going to mine the Bitcoin from, where they are going to manage Bitcoin, and who they are going to transact with (Deutsche Bundesbank, 2017b). According to European Central Bank, the fraud that the users face in Bitcoin results from the organization who provides the Bitcoin, and it happens as Bitcoin itself has no—or lack of—legal jurisdiction (European Central Bank, 2012, 2015). Furthermore, Government Accountability Office (2014) also described that the fraud the Bitcoin users will face is the computer-fraud, devious and fraudulent investment scheme, and Bitcoin theft.

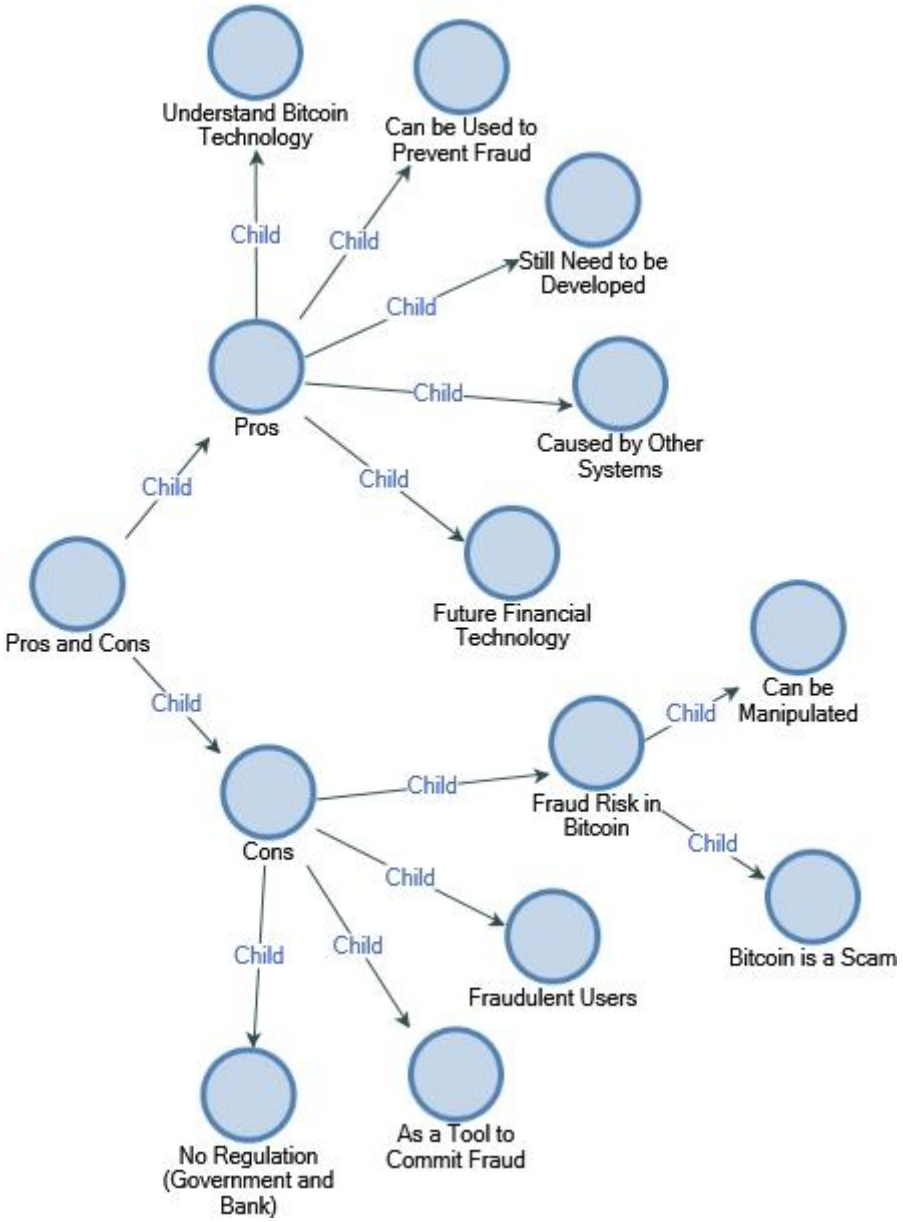
4.4. Pros and Cons of Bitcoin from Twitter Users' Point of View

The pros and cons of bitcoin arise because of the existence of bitcoin which

is considered an invention. Bitcoin system was first invented by someone who claimed as “Nakamoto Satoshi” in 2008. Since then, many experts and people around the world have questioned whether this bitcoin system is safe to use. In the meantime, there is no confirmation or future research to prove whether bitcoin is fraud, or it is a safe invention. Thus, the researcher will discuss and analyze the opinions about bitcoin. The opinion of Twitter users will be divided into two opinions; pros and cons of Bitcoin.

Figure 4.9 shows who advocates and opposes Bitcoin. The map of opinion is divided into two reasons why they think Bitcoin is a fraud and why they think it is not a fraud. Furthermore, the deeper explanation of the Twitter users and its coded tweets, presenting their opinions shown in table 4.6.

Figure 4.10 Analytical Map of Pros and Cons of Bitcoin from Twitter Users



Source: Data is processed with NVIVO 11 Plus by researcher

Table 4.7 Matrix Coding Query Based on Coded Source from Twitter Users' Point of View

	A : As a Tool to Commit Fraud	B : Bitcoin is a Scam	C : Can be Manipulated	D : Fraudulent Users	E : No Regulation (Government and Bank)	F : Can be Used to Prevent Fraud	G : Caused by Other Systems	H : Future Financial Technology	I : Still Need to be Developed	J : Understand Bitcoin Technology
1 : _Strategia_	No	No	No	No	No	No	No	Yes	Yes	No
2 : 1234goplay	No	Yes	No	No	No	No	No	No	No	No
3 : AlexGheorghiu3	No	No	No	No	No	No	Yes	No	No	No
4 : BitcoinBolt	No	No	No	No	Yes	Yes	No	No	No	No
5 : BitcoinInsight0	No	Yes	No	No	No	No	No	No	No	Yes
6 : Bitcoinized	No	No	No	No	Yes	Yes	Yes	No	No	No
7 : BitcoinWrld	No	No	No	No	No	No	No	No	Yes	No
8 : Bitfinexed	Yes	No	No	No	No	No	Yes	No	No	No
9 : BitsandBights	No	No	No	No	No	No	No	Yes	No	Yes
10 : BrianBrownNet	No	Yes	No	No	No	No	No	Yes	No	No
11 : BTCNewsUpdates	No	No	No	No	No	No	Yes	No	No	No
12 : byourist	No	No	No	Yes	No	No	Yes	No	No	No
13 : CogitoErgoCode	No	No	No	No	No	Yes	Yes	No	No	Yes
14 : CoinLook	No	No	No	No	Yes	No	No	Yes	No	No
15 : coinspectator	No	No	No	No	Yes	No	Yes	No	No	No
16 : Crypto_Newz	No	Yes	No	No	Yes	No	No	No	No	Yes
17 : crypto_savior	No	No	No	No	No	No	No	Yes	No	No
18 : CryptoBrokerIO	No	No	No	No	Yes	No	No	No	No	No
19 : CryptoCurrent	No	Yes	No	No	No	No	No	Yes	No	No
20 : cryptominernews	No	No	No	No	Yes	No	No	No	No	No

	A : As a Tool to Commit Fraud	B : Bitcoin is a Scam	C : Can be Manipulated	D : Fraudulent Users	E : No Regulation (Government and Bank)	F : Can be Used to Prevent Fraud	G : Caused by Other Systems	H : Future Financial Technology	I : Still Need to be Developed	J : Understand Bitcoin Technology
21 : Cryptow1re	No	No	No	No	No	Yes	Yes	No	No	Yes
22 : DailyBrian	No	Yes	No	No	No	No	No	Yes	No	No
23 : darkisdarkn1	No	No	No	No	Yes	No	No	No	No	No
24 : devnullius	No	No	No	No	Yes	Yes	Yes	No	No	Yes
25 : DigitalDoshNews	No	No	No	No	Yes	No	No	No	No	No
26 : INeedRocksNMoon	No	No	No	No	No	No	Yes	No	No	No
27 : JacekSalaj	No	No	No	No	No	No	No	Yes	No	No
28 : jidept	No	No	No	No	No	No	Yes	No	No	No
29 : LetsTalkPaymnts	No	No	No	No	No	No	No	Yes	Yes	No
30 : mikenavid18	Yes	No	No	Yes	No	No	No	No	No	No
31 : oskaaay	No	No	No	No	No	No	No	Yes	No	No
32 : patmillertime	No	No	No	No	No	No	Yes	No	No	Yes
33 : petergo99037185	No	No	Yes	No	Yes	No	No	No	No	No
34 : politicalHEDGE	No	No	No	No	Yes	No	No	No	No	No
35 : Remi_Vladuceanu	No	No	No	No	No	No	Yes	No	No	No
36 : RoccoDallas	No	No	No	No	Yes	Yes	Yes	Yes	No	No
37 : SportsbookBTC	No	Yes	No	No	Yes	No	No	No	No	No
38 : Valustks1	Yes	No	No	Yes	No	No	No	No	No	No
39 : waq_azeem	No	No	No	No	No	No	No	No	No	Yes
40 : WuWeiTaoist	No	No	No	No	No	Yes	Yes	Yes	No	No

Source: Data is processed with NVIVO 11 Plus by

Note: Matrix coding is generated based on coding presence

From matrix coding query results, we can further describe the data. The matrix coding query above refer to the tweets from each user which relate every column in more advanced way. They are represented whether the Twitter users voiced the opinion on representative topics or not, completed with the 'Yes' or 'No' label and the blue color in each box. When Twitter users had voiced their opinions, the box would be on blue color with 'Yes' label inside and vice versa.

4.4.1. Pros of Bitcoin from Twitter Users' Point of View

Statements of why users are pros with the existence of Bitcoin were collected after the researcher read the tweets from top 40 users with the highest references. The opinions will be based on why the Twitter users thought that it is right to use Bitcoin, or Bitcoin is very useful if they use it in the right way. There are total 19 (nineteen) users out of 40 users who think that bitcoin is not a fraud. The statements or opinion about why those 19 users are pros of Bitcoin will be explained below.

4.4.1.1. Bitcoin's Technology Can be Implemented to Prevent Fraud

It was found out that there are users who have an opinion that Bitcoin itself can be implemented as fraud prevention. The Twitter users think that bitcoin can be used to prevent fraud since the current financial system—with the usual money—is becoming the main reason why fraud is happening. The fraudsters nowadays, use money as the reason why they commit fraud. The Twitter users think that since many fraudsters use money as the tool to commit fraud, it means that the money system is weak enough, so the fraudsters can break into the system's security.

Moreover, some of Twitter users; Devnullius, Cryptow1re, CogitoErgoCode, Bitcoinized, WuWeiTaoist, and RoccoDallas, also thought the money system is old enough, and it might be one of the reasons why fraudster can break into the system's security. Meanwhile, with the invention of bitcoin as a new system to financial technology, the Twitter users thought it gives a new light to the financial system as it is considered a new system, and the fraudster cannot break the system yet.

Another reason why Bitcoin can prevent fraud is contended by BitcoinBolt. The opinion says that the blockchain technology (a system which provides bitcoin) can be adapted as a system to secure information and guarantee validity of a job recruitment process.

4.4.1.2. The Presumption of Fraud is Actually Caused by Other Systems

> "The only fraud in this equation is for BTC to be claiming to be Bitcoin. It might be better than Bitcoin, who knows, but it most definitely is not Bitcoin, and the fraud happened when Bitcoin Segwit retained the BTC ticker and confused the users." - AlexGheorghiu3

The excerption from a reply by a Twitter username named "AlexGheorghiu3" is one of the arguments that fraud in bitcoin is caused by other systems. Those who are pros of Bitcoin argued that there are a real "Bitcoin" cryptocurrency and its blockchain system, and there is another cryptocurrency which looks like Bitcoin, but it is a different system. The Twitter users who stated this statement claimed that there is only one Bitcoin with blockchain system. The other cryptocurrency who claims to be Bitcoin is categorized as a fraud.

The claim by "fake" bitcoin system by other cryptocurrencies, as said by the Twitter users, has lead people who do not know or who just learn about Bitcoin think that Bitcoin contains frauds in it, but the truth is those frauds are caused by “fake” Bitcoin system. The fake Bitcoin that is claimed by the Twitter users are Bitcoin Cash, Tether, Altcoins, Legacy Bitcoin, Bitcoin Core, Bitcoin Segwit, and Bitcoin Blockstream.

“Fake” might be a strong word, then a “copycat” might a close word to describe those cryptocurrencies. The Twitter users who said the statement above also argued that copycats do not give any advantage for the investors. This is of course harms Bitcoin’s reputation in the investors’ eyes.

4.4.1.3. The Undeveloped Bitcoin Makes the Uncertainty Arise; Bitcoin is the Future of Financial Technology

Future financial technology is the second highest reason why Bitcoin’s supporters in Twitter said that Bitcoin is indeed not a fraud. As explained in “Bitcoin can be used to prevent fraud” opinion, the monetary system will be replaced with Bitcoin, sooner or later, just as gold that was replaced with paper money back then.

Moreover, another argument of why they are pros of Bitcoin, is because it is a considerably invention, it makes sense if the system is not stable yet. Even though it is not stable, the technology which surrounds the bitcoin itself—the blockchain—is substantially a great invention. The imperfection of blockchain, without a doubt—as what the Twitter users think—will become better in the future, and it is going to be a replacement for the future technology.

The statement that bitcoin is a future financial technology is also admitted by one of the bitcoin's rivals' CEO in cryptocurrency, Ripple. Many people are skeptical of Bitcoin since it is an invention, yet its obstacle arises faster than inventors have ever imagined. The complicated system which surrounds over Bitcoin is also hard to understand—even those who invest their money in bitcoin are still learning how to take the benefits of bitcoin in an accurate way.

No matter how great the technology which surrounds the bitcoin is, the technology itself will still need to be developed in the future.

> "Bitcoin is "An experiment in monetary theory. It's a breakthrough..." - Joe Lubin, Ethereum Co-founder.

The excerption above is quoted by _Strategia_. It is one of the opinions saying, that Bitcoin is a technology which needs to be developed. The quote itself from Joe Lubin, the Ethereum's Co-founder, one of the Bitcoin's rivals. The Twitter users who support Bitcoin thought that it still early to judge that Bitcoin is a fraud. The imperfections are still there, and such circumstances is understandable. As what Joe Lubin said, the Bitcoin is an "experiment", yet the technology behind it is already at a substantial level—even though it still needs to be developed.

4.4.1.4. Twitter Users Understand the Technology Behind Bitcoin

Those are Twitter users who have just know Bitcoin technology and yet they already have a conclusion that Bitcoin contains fraud inside the system. This might be what the other Twitter users who are pros of Bitcoin think why

the opposite side are cons of Bitcoin. Those who are pro Bitcoin thought that they understand more about Bitcoin's system and technology, thus they are pros of it.

Furthermore, there are also the Twitter Users who admitted that they made the “mistake” by saying Bitcoin contains fraud after understanding the technology behind it. This has made Bitcoin’s supporters pleased because finally those opposite users admit that Bitcoin is not just a system, but it is more complicated than that.

Twitter users who are pros of Bitcoin say, Bitcoin will not automatically "die" from the presumption of fraud made by the non-supporters of Bitcoin, since they cannot give a reliable reason why they do not agree with Bitcoin system. Moreover, the Twitter users who are pro Bitcoin said it is because the non-supporters of Bitcoin do not understand the Bitcoin system at all.

4.4.2. Cons of Bitcoin from Twitter Users’ Point of View

The cons of Bitcoin from Twitter users’ point of view will mainly be based on why the users think that Bitcoin cannot be compared to the traditional currency. And after the researcher analyzed the tweets coming from the Twitter users regarding Bitcoin, the researcher divided the Twitter users’ opinions on representative classification. From the classification, most of the con opinions of Bitcoin are related to fraud.

1. ***Fraudsters Take Advantage of Bitcoin as an Instrument to Commit Fraud***

From table 4.6, in column “As a Tool to Commit Fraud”, there are total three Twitter users who tweeted about this. Bitfinexed, one of the three Twitter users, said that if you trade your Bitcoin in Bitcoin exchange it would mainly relate to the security list. Bitfinexed further said that if the CFO of the security where people invested their Bitcoin, hinted that CFO allegedly committed a Ponzi scheme fraud, people must not invest their Bitcoin and should withdraw their investment as soon as possible. Another Twitter user, Valustks1, stated that at some point, Bitcoin was hacked by fraudsters.

Moreover, a Twitter user called Mikenavid18, claimed that he was a victim of Bitcoin scam. At the con opinion of Bitcoin from official bodies above, we already knew that one of the scams which committed by taking advantage of Bitcoin—when the victim invested their money to the Bitcoin provider and expected some amount of Bitcoin in their wallet but nothing was there—and this what happened with Mikenavid18.

2. The Presence of Fraud Risk in Bitcoin

In this section discusses how Twitter users tweeted that Bitcoin carries a fraud risk inside the system. The fraud risk usually found inside Bitcoin system are; Bitcoin itself is a scam in cyber world, and Bitcoin can be manipulated by the fraudster.

The first fraud risk that came into highlight is “Bitcoin is a Scam”. From table 4.6, we can see that this statement was tweeted by seven Twitter users. SportsbookBTC and Crypto_Newz both said in their tweet that they have forewarned about the other scams in Bitcoin that would likely arise after one of

the Bitcoin providers was shut down. Moreover, 1234goplay tweeted that after the significant increase and decrease of Bitcoin's value, the legal authorities started to warn people about the potential fraud in Bitcoin in the form of "Bitcoin scam". Lastly, Bitcoininsight0 tweeted that since there were many news that stated about scam inside Bitcoin, the owner of Identity of Mind—a provider in digital identity—Neil Reiter stated that Bitcoin has become a riskier target for fraud crime than other traditional system, so that they have developed a prevention of fraud software.

The second fraud risk that came into highlight is "Bitcoin can be manipulated". The manipulation occurs because the users do not have to disclose their identity and there are no legal authorities behind Bitcoin. There are total two statements about this matter from a Twitter user, Petergo99037185. Petergo99037185 tweeted about his curiosity why people still followed a Bitcoin provider who already manipulated their Bitcoins and speculated that the reason why Bitcoin's price was going down fast because of being manipulated.

3. The Owner of Bitcoin are Fraudulent Users

The next con opinion of Bitcoin from Twitter users' point of view is the fraudulent users who controll Bitcoin. Byourist tweeted that a larger miner of Bitcoin was committing a fraud using Bitcoin, and he cautioned other Bitcoin users to stay away from that miner. Additionally, in line with their statement in Bitcoin "As a tool to commit fraud" section, Mikenavid18 and Valustks1 further said that what we had discussed earlier was result of fraudulent users who

controlled Bitcoin.

4. The Absence of Regulation from Government and Central Bank

The fact that Bitcoin currently does not have any regulation from government and central bank, has an impact on the Bitcoin development. As we know, no regulation or no legal jurisdiction for Bitcoin give criminals and fraudsters an opportunity to commit illegal activity freely. This thing brought a concern to some Twitter users. DigitalDoshNews, Bitcoinized, CryptoBrokerIO, Coinspectator, Devnullius, and CoinLook tweeted about this. All of them tweeted in a similar way, lack of regulation in Bitcoin result in manipulation and scams in Bitcoin. Cryptominernews also tweeted that according to Bank of America, Bitcoin is labeled as a 'fraud'. Bank of America is charged with controlling and regulation for the US dollar currency. When Bank of America had labelled Bitcoin as a 'fraud', it is clear that Bitcoin does not have any regulation behind it.

4.4.3. Analysis of The Most Influential Twitter User in the Social Network

In this section discusses the role of each top 40 Twitter users; whether they still have a big role in Twitter network in their interaction with the rest of users?

We are going to use Twitter sociogram in order to discuss the role of top 40 Twitter users with the highest references in their network. The Twitter sociogram itself will include the diagram and the centrality measure table from the top 40 Twitter users. In the table 4.7 the order of username is based on Twitter users who got the highest number of degree—the easiest way to interpret the role of each

Twitter users in a social network—and then compare to the references that they got; do the Twitter users who have a high reference also bring a big impact or having a big role around the other Twitter users?

If we reexamine, table 4.8, table 4.9, and table 4.10, these are tables of centrality measures from top 40 Twitter users based on the highest tweet. It is worth knowing that the data captured by NCapture from NVivo 11, are not filtered yet. The original data consist of tweets and retweets, but then it has been filtered to be tweets, excluding the retweets.

The filtered data generate in top 40 Twitter users with the highest tweets among other users who tweeted on the date of the data retrieved. The original centrality measure was processed with a total of 1894 Twitter users, before it was selected again to be top 40 Twitter users with the highest number of tweets. Before we started to analyze from each measurement, we can see from the table 4.8, table 4.9, and table 4.10 below that when a user got high measurement in one method, it does not mean that this user will also get a high measurement in other methods.

1. Based on Degree (In and Out)

The first centrality measurement that we are going to discuss in centrality measure is based on *Degree*. There are two kinds of degrees; degree in and degree out. Degree is the easiest way of centrality measurement that can be interpreted; we can just look at how many edges are there which connected between two vertices directly (Scott, 2000). From table 4.8 below, BTCNewsUpdates got the highest number of degrees among the top 40 Twitter users with the highest number of tweets and among all the 1894 Twitter users with 117 degrees, which included 2

degrees in and 116 degrees out. With these numbers, we can interpret that among the top 40 users—and all 1894 Twitter users in total—BTCNewsUpdates is the most popular among the Twitter users (see **Appendix A1**). Note that the figure of BTCNewsUpdates's sociogram is only shown on how BTCNewsUpdates directly influence the Twitter users around them.

After BTCNewsUpdates, Patmillertime has the second highest number of degrees with 19 degrees from top 40 Twitter users; 1 degree in and 19 degrees out (see **Appendix A2**). From the two highest degree, we can see the network difference that Twitter users had. BTCNewsUpdates got a high number of degrees, the network was also packed with other Twitter users mentioned by BTCNewsUpdates (the degree out) and Twitter users which mentioned BTCNewsUpdates (the degree in).

Table 4.8 Degree Centrality Measure

Username	Degree	Degree In	Degree Out
BTCNewsUpdates	117	2	116
patmillertime	19	1	19
AlexGheorghiu3	8	2	7
byourist	7	0	7
jidept	6	0	6
Bitfinexed	6	5	1
mikenavid18	4	0	4
Valustks1	4	0	4
JacekSalaj	3	0	3
BitcoinWrld	2	2	0
Cryptow1re	2	0	2
petergo99037185	1	0	1
BrianBrownNet	1	0	1
DailyBrian	1	1	0
Bitcoinized	1	1	0
BitsandBights	1	0	1
oskaaay	1	0	1
waq_azeem	1	0	1
Remi_Vladuceanu	0	0	0
coinspectator	0	0	0
politicalHEDGE	0	0	0
CryptoCurrent	0	0	0
cryptominernews	0	0	0
INeedRocksNMoon	0	0	0
SportsbookBTC	0	0	0
1234goplay	0	0	0
BitcoinInsight0	0	0	0
Crypto_Newz	0	0	0
darkisdarkn1	0	0	0
devnullius	0	0	0
LetsTalkPaymnts	0	0	0
RoccoDallas	0	0	0
WuWeiTaoist	0	0	0
Strategia	0	0	0
BitcoinBolt	0	0	0
CogitoErgoCode	0	0	0
CoinLook	0	0	0
crypto_savior	0	0	0
CryptoBrokerIO	0	0	0
DigitalDoshNews	0	0	0

Source: Data is processed with NVIVO 11 Plus by researcher

2. Based on Betweenness

The second measurement of centrality measure is based on *Betweenness* of users. In this measurement, it is going to be harder when we try to interpret the meaning of measurement only from the diagram, as already done with degree measurement. We need to look and interpret it from the number. As we can see from table 4.9, again, similar with the result of degree measurement, BTCNewsUpdates got the highest betweenness number. BTCNewsUpdates got 106712.949 in result for betweenness measurement. The number is the highest number among top 40 Twitter users with the highest references.

The highest betweenness number among the top 40 users, informs that BTCNewsUpdates is the user with the most information coming in. This also means that BTCNewsUpdates is the bridge which connects between some bigger networks; there is one vertex that is connected to BTCNewsUpdates directly, and in its own network; this vertex brings another big impact on its surrounding. When this happens that is where BTCNewsUpdates plays a role as a connector between networks, with information flows from BTCNewsUpdates. This number also means that BTCNewsUpdates also bringst a big influence among the top 40 Twitter users (see **Appendix A3**).

So, what is the relation between BTCNewsUpdates becoming the most influencing Twitter users account and how BTCNewsUpdates tweeted the opinion of Bitcoin?

Table 4.9 Betweenness Centrality Measure

Rank	Username	Betweenness	Rank	Username	Betweenness
1	BTCNewsUpdates	106712.949	21	politicalHEDGE	0.000
2	patmillertime	22544.318	22	CryptoCurrent	0.000
3	byourist	12231.654	23	cryptominernews	0.000
4	Valustks1	10793.204	24	INeedRocksNMoon	0.000
5	JacekSalaj	3840.000	25	SportsbookBTC	0.000
6	AlexGheorghiu3	3375.593	26	1234goplay	0.000
7	Cryptow1re	964.000	27	BitcoinInsight0	0.000
8	Bitfinexed	170.000	28	Crypto_Newz	0.000
9	jidept	35.000	29	darkisdarkn1	0.000
10	mikenavid18	12.000	30	devnullius	0.000
11	BitcoinWrld	4.000	31	LetsTalkPaymnts	0.000
12	petergo99037185	0.000	32	RoccoDallas	0.000
13	BrianBrownNet	0.000	33	WuWeiTaoist	0.000
14	DailyBrian	0.000	34	_Strategia_	0.000
15	Bitcoinized	0.000	35	BitcoinBolt	0.000
16	BitsandBights	0.000	36	CogitoErgoCode	0.000
17	oskaaay	0.000	37	CoinLook	0.000
18	waq_azeem	0.000	38	crypto_savior	0.000
19	Remi_Vladuceanu	0.000	39	CryptoBrokerIO	0.000
20	coinspectator	0.000	40	DigitalDoshNews	0.000

Source: Data is processed with NVIVO 11 Plus by researcher

In one of BTCNewsUpdates's opinions, it discusses how the fraud in Bitcoin is not entirely Bitcoin's failure, since the fraud happens is caused by other system copying Bitcoin's technology and claiming to be the real Bitcoin. Then with those opinions voiced by BTCNewsUpdates, BTCNewsUpdates has influenced the other Twitter users.

Table 4.9 of centrality measure displays Byourist got higher betweenness amount (12231.654) than AlexGheorghiu3 (3375.593), although Byourist had a lower degree amount (7) than AlexGheorghiu3 (8) in table 4.7. This explains that, although a vertex got more connection to the other Twitter users, it does not mean

that vertex will always be in control of information flows between two networks or more. In this case, Byourist had more control power in information flows and had more influence than AlexGheorghiu3 (see **Appendix A4**).

3. Based on Closeness

The third centrality measurement is based on the *closeness measurement*. It is hard to interpret the meaning of this measurement if we only look at the diagram. Based on the table 4.10 about closeness centrality measure of the top 40 Twitter users, this time BTCNewsUpdates who dominated the other two measurements, did not achieve the highest number of closeness measurement. There are five users who got the same number of closeness measurement; Petergo99037185, BrianBrownNet, DailyBrian, BitsandBights, and Waq_azeem—all of them got 1.000 on their closeness measurement result. The researcher will take an example from BitsandBights's Twitter sociogram based on the closeness measurement. See **Appendix A5** for the BitsandBight's sociogram.

Closeness measurement serves to measure which networks have the highest speed of information reaching out from one vertex to other vertex (QSR International, 2015i). In other words, from the top 40 Twitter users with the highest references, BitsandBights is one of the five Twitter users who have highest number of closeness. In BitsandBights's Twitter sociogram, BitsandBights could deliver information on highest speed to its network members—TacoTender, SilentWhstlBwr, and Courneynoelg. Further analysis might be added that, when the networks are separated, each of networks has its own closeness centrality, that is, measurement that only covered each network. For example, BitsandBights and

Petergo99037185 network are different from each other, which means that their closeness measurement is different too even though they have same number of closeness. Another thing to be highlighted, the reason why BTCNewsUpdates does not have a high closeness measurement (0.001), is because BTCNewsUpdates's network members is large. The larger the network, the slower the speed to deliver the information since there is vertices that should be delivered with information.

Table 4.10 Closeness Centrality Measure

Rank	Username	Closeness	Rank	Username	Closeness
1	petergo99037185	1.000	21	politicalHEDGE	0.000
2	BrianBrownNet	1.000	22	CryptoCurrent	0.000
3	DailyBrian	1.000	23	cryptominernews	0.000
4	BitsandBights	1.000	24	INeedRocksNMoon	0.000
5	waq_azeem	1.000	25	SportsbookBTC	0.000
6	mikenavid18	0.250	26	1234goplay	0.000
7	BitcoinWrld	0.250	27	BitcoinInsight0	0.000
8	oskaaay	0.200	28	Crypto_Newz	0.000
9	jidept	0.063	29	darkisdarkn1	0.000
10	Bitfinexed	0.028	30	devnullius	0.000
11	BTCNewsUpdates	0.001	31	LetsTalkPaymnts	0.000
12	patmillertime	0.001	32	RoccoDallas	0.000
13	AlexGheorghiu3	0.001	33	WuWeiTaoist	0.000
14	byourist	0.001	34	_Strategia_	0.000
15	Valustks1	0.001	35	BitcoinBolt	0.000
16	JacekSalaj	0.000	36	CogitoErgoCode	0.000
17	Cryptow1re	0.000	37	CoinLook	0.000
18	Bitcoinized	0.000	38	crypto_savior	0.000
19	Remi_Vladuceanu	0.000	39	CryptoBrokerIO	0.000
20	coinspectator	0.000	40	DigitalDoshNews	0.000

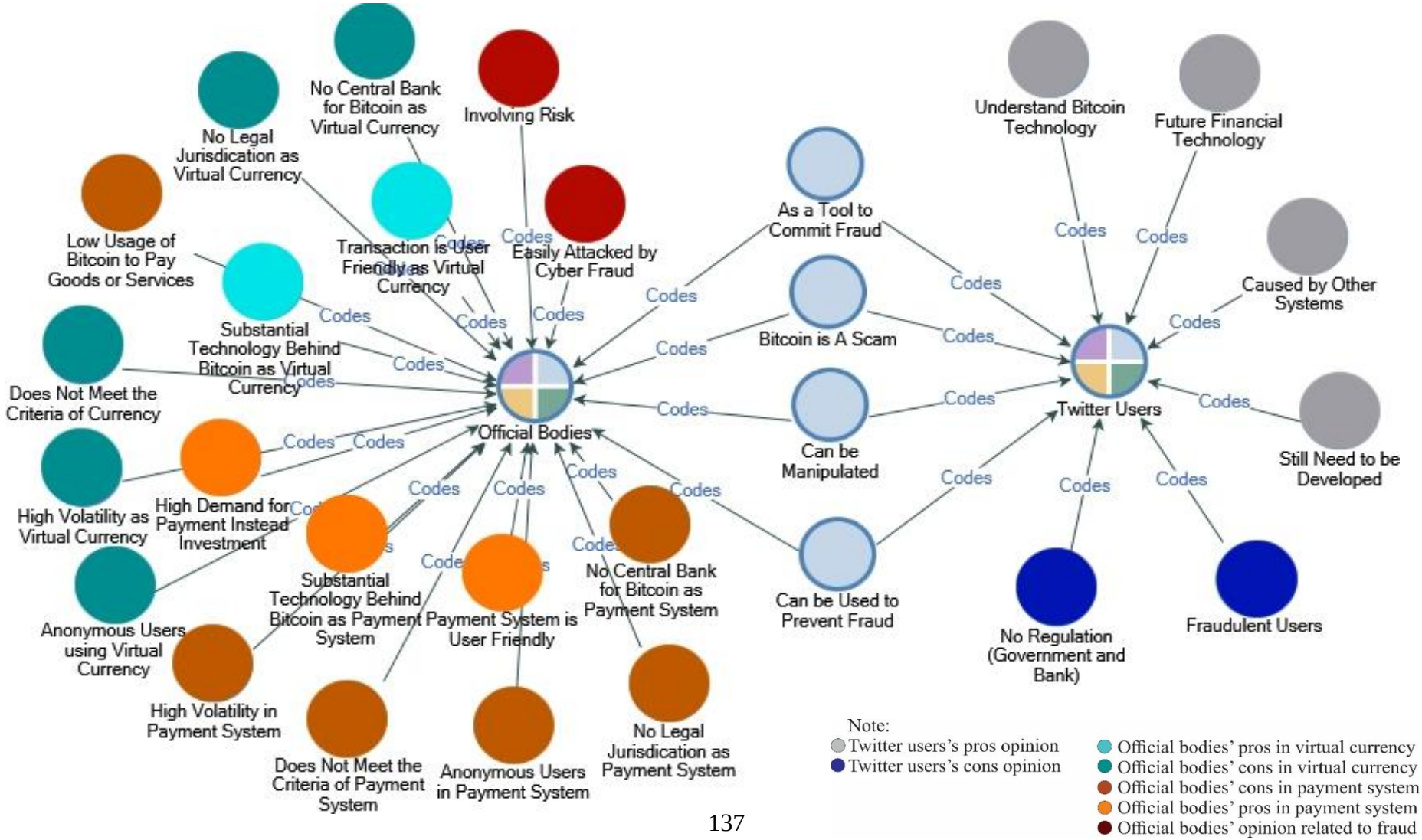
Source: Data is processed with NVIVO 11 Plus by researcher

4.5. Comparison Between the Opinion of Official Bodies and Twitter Users on Bitcoin Related to Fraud

This section presents the comparison of opinions between official bodies and Twitter users; do they have the same opinions or different opinions related to fraud in Bitcoin? Figure 4.10 below is the map of the comparison.

Figure 4.10 demonstrates the nodes which are placed between official bodies and Twitters users are the opinions that are comparable. The comparable opinions as follows; First, official bodies and Twitter users agree that Bitcoin is usually used by the fraudster as an instrument to commit fraud; Second, both official bodies and Twitter users agree that Bitcoin is a kind of a scam; Third, both official bodies and Twitter users agree that what makes Bitcoin can be related to fraud because it can be manipulated easily; Fourth—concerning the pro opinion on Bitcoin related to fraud—both official bodies and Twitter users agree that even though Bitcoin is associated with fraudulent activities, Bitcoin also can be used as fraud prevention.

Figure 4.11 Analytical Map of Comparison Opinion Between Twitter Users and Official Bodies Related to Fraud



Source: Data is processed with NVIVO 11 Plus by researcher

Table 4.11 Matrix Coding Query Based on Coded Source from Each Official Body and Fraud Related Opinion

	A : As a Tool to Commit Fraud	B : Bitcoin is A Scam	C : Can be Manipulated	D : Can be Used to Prevent Fraud
1 : Official Bodies	42	8	11	3
2 : Twitter Users	3	7	2	7

Source: Data is processed with NVIVO 11 Plus by researcher

Matrix coding is generated based on coding references

1. ***Fraudster Take Advantage of Bitcoin as an Instrument to Commit Fraud***

Based on table 4.11 above, most of official bodies voiced their opinion on Bitcoin related to fraud that Bitcoin is mainly used as instrument to commit fraud activities—in contrast with the Twitter users where there are only three references who contended so, stated.

One of statements related to Bitcoin as an instrument to commit fraud is from Fujii-Rajani (2018) which stated that due to money laundering activities using Bitcoin, bank closed the accounts involved in the money laundering activities. From Twitter users' side, one of the opinions is voiced out by Bitfinexed, saying that one of the Bitcoin provider's founder just committed fraud which looked like a Ponzi scheme using Bitcoin as the tool to commit it.

2. ***The Manipulation in Bitcoin Resulting from Anonymity of its Users***

Additionally, on the official bodies' side, the second highest opinion on Bitcoin related to fraud is that what make Bitcoin has a large part in fraudulent activities is

because it can be manipulated easily. There are eleven opinions which stated by official bodies. Similar with the opinion that Bitcoin can be used as an instrument to commit fraud, in contrast with official bodies, Twitter users only stated two opinions related to Bitcoin which can be manipulated easily.

From official bodies, the opinions related to manipulation in Bitcoin is caused by lack of transparency, that the fraudsters would freely use Bitcoin to commit fraud (Ali et al., 2014; Badev & Chen, 2014; Deutsche Bundesbank, 2017a; Nakaso, 2016). European Central Bank (2015) further added that manipulation usually happens when people use Bitcoin as investment and payment. Meanwhile, Twitter users who tweeted their opinion related to this is Petergo99037185. Petergo99037185 tweeted about the price of Bitcoin which was going down fast because there were manipulation activities behind it.

3. Bitcoin was Used to Defraud People in Scam Activities

In this opinion, both official bodies and Twitter users voiced similar amount of opinions. The small difference in the amount of opinion voiced by the two parties indicates they agree with the opinion on Bitcoin used to defraud people in scam activities in the same proportion. Back to the previous discussion related to this section from official bodies, the scam activities which are mainly committed to defrauding people are scam that happens in payment and investment activities using Bitcoin (Budding, 2013; European Central Bank, 2015; Federal Bureau of Investigation, 2014; Fujii-Rajani, 2018; Government Accountability Office, 2014). The scam happening in payment system is usually in a scheme when the fraudster acts as a seller. When the

victim already pays the goods, the fraudster steals the Bitcoin from the victim and vice versa (European Central Bank, 2015).

In a similar opinion, from Twitter users' side, there is 1234goplay. 1234goplay tweeted that the legal authorities have reminded us about the potential fraud risk in Bitcoin in a form of 'Bitcoin scam'. Additionally, SportsbookBTC and Crypto_Newz both said in their tweet that they cautioned about the other scams in Bitcoin that would likely arise after one of the Bitcoin providers was shut down. Bitcoininsight0 also tweeted that there is a scam software prevention developed by Identity of Mind, which is made especially for Bitcoin users to prevent scam considering that Bitcoin is very vulnerable to scam fraud.

4. Bitcoin's Technology Can be Implemented to Prevent Fraud

The last opinion that both official bodies and Twitter users agree is the opinion on the capability of Bitcoin's technology that can be implemented to prevent fraud. In contrast with the previous opinion for the comparison between official bodies and Twitter users, in this opinion, Twitter users have seven tweets in total which voiced this opinion, while official bodies only have three opinions.

Previously, the opinion from Twitter users is argued by BitcoinBolt which says that the blockchain technology (a system which provides bitcoin) can be adapted as a system to secure information and guarantee validity of a job recruitment process. Meanwhile, Devnullius, Cryptow1re, CogitoErgoCode, Bitcoinized, WuWeiTaoist, and RoccoDallas tweeted their opinion that, since the Bitcoin's technology is relatively new compared to the traditional financial system such as money, it will be hard for the

fraudster to break the system. Thus, it has proven that the Bitcoin's technology itself can be implemented to prevent fraud.

Official bodies also contended how Bitcoin's technology can be used to prevent fraud. The idea was put forward by Fujii-Rajani (2018) and Kumar & Smith (2017) regarding the Bitcoin's blockchain and its decentralized ledger technology. Fujii-Rajani (2018) stated that the blockchain could minimalize the fraud that occurs in insurance company's system, since blockchain technology allows the users to give information to each other regarding insurance transactions. While Kumar & Smith (2017) stated that the blockchain's decentralized system would not allow some embezzlement to occur in Bitcoin balances—for example is when people are having a transaction in Bitcoin, they cannot turn over the transaction as what usually happens with the credit card transaction where frauds usually happens.

4.6. Conclusion for Chapter IV: Data Analysis and Discussion

After the analysis and discussion on the data collected, now the researcher would like to draw a few conclusions of Chapter 4. From the problem formulation 1, the official bodies tend to have con opinions on Bitcoin as there are many ideas about con opinion rather than the pro opinion. This is applied to both general opinions about Bitcoin as payment system and virtual currency, and to Bitcoin fraud related opinions. The interesting thing is, for general opinions, we can see from the analytical maps that there are official bodies who did not voice any single opinion towards certain idea. Although official bodies did not voice their opinion on each idea, they voiced their

opinion on fraud-related opinions. It indicates that all official bodies agreed Bitcoin would have a strong correlation with fraud. Meanwhile, for Twitter users' opinions, we can see that Twitter users had more opinions on Bitcoin, especially the pro opinion on Bitcoins. This indicates that Twitter users were more open-minded to the existence of Bitcoin, although the number of Bitcoin users is less than that of the traditional systems.

Furthermore, for the opinion comparison, in general, both official bodies and Twitter users agree with the four topics of pros and cons in Bitcoin which has been a debatable topic since Bitcoin was invented. While the official bodies dominate the three opinions above, Twitter users are more concerned with Bitcoin's pro opinion related to fraud. This indicates that Twitter users tend to focus on the positive side of Bitcoin related to fraud. On the contrary, the positive side is not the main concern of the official bodies. This means that there are Twitter users who believe in Bitcoin that can bring a positive impact on fraudulent activities' prevention.