CHAPTER 13

Regulatory and *Shari'ah* Framework of Cryptocurrency

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Introduction

Cryptocurrency has been seen to create a new phenomenon to the landscape of financial services industry. It has gained traction in attracting all relevant players in the industry to delve deeper into the issue. Preceding bitcoin as the inaugural prevalent product, cryptocurrency has been utilized as the medium of payment in various sectors. Since then, cryptocurrency become up-to-the-minute phenomena in the financial services industry. To many, the scheme seemed to exhibit many potential benefits including greater speed of payment and efficiency particularly

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cross-borders and thus serves as the best choice to ultimately promote financial inclusion using online platform.[1]

Cryptocurrency, being one of the types of virtual currency, is a privately owned system that mainly offers to facilitate peer-to-peer exchange system bypassing traditional financial institutions' services and clearing houses. The penetration has also been pervasive in Islamic finance landscape. It is apparent through the introduction of Blossom Finance in Indonesia that used cryptocurrency (bitcoin), as the currency of the capital in *Mudarabah* structure of micro-financing that they facilitated.[2]

Since cryptocurrency is a new phenomenon in the financial system, the world's financial regulators are seemed to be indecisive on their approach towards cryptocurrency and digital currencies. There is widespread concern about the digital currency system's possible impact on national currencies, its potential for criminal misuse and the implications of its use for taxation. Many countries are still unconvinced that digital currencies or cryptocurrencies are to be accorded the status as a legal tender.

Similarly, how cryptocurrency is perceived in Shari'ah perspective has not been widely discussed. Whether cryptocurrency satisfies the core principles of Shari'ah and legal tender status is among the main issues argued by many scholars. This is evidenced by the contemporary views of Muslim scholars on this matter. Using the *fatwa* as the basis of the discussion, this research examines the Shari'ah perspective of cryptocurrency and highlights the issues and concerns. This is followed by the discussion on the regulatory framework on cryptocurrency in selected countries.

Regulatory Framework on Cryptocurrency

There have been few regulatory responses regarding virtual currency. This denotes a new milestone for this emerging phenomenon that has caught regulators' attention to put forth cryptocurrency as one of their

[1] Quoc Khanh Nguyen, "Blockchain—A Financial Technology for Future Sustainable Development", *3rd International Conference on Green Technology and Sustainable Development*, 2016: 51.

[2] Jamie Redman, "Bitcoin Brings '100% Mathematical Certainty' to Comply with Islamic Law", *The Coin Telegraph*, https://cointelegraph.com/news/bitcoin-brings-100-mathematical-certainty-to-comply-with-islamic-law (accessed January 12, 2017).

regulatory concerns. This discussion highlights the regulatory framework of selected countries that are considered as active participants in cryptocurrency dealings and have officially made a statement of their position regarding cryptocurrency.

Malaysia

The Central Bank of Malaysia (CBM) does not impose a blanket ban approach on cryptocurrency, viewing that it would otherwise stifle innovation and creativity. The concern is much amplified from the perspective of Anti-Money Laundering and Counter Financing of Terrorism Act (AML/CFT). CBM has issued a Policy Document (PD) of AML/CFT—Digital Currencies (Sector 6) 2016 to address risks associated with digital currencies. The PD in a nutshell sets out minimum requirement and standard of reporting that has to be observed to improve transparency of activities related to digital currencies. In the PD, there is no explicit provision concerning cryptocurrency per se, but rather provides a broader regulatory guidance on digital currency exchanges for avoidance of anti-money laundering and terrorism financing (AM/TF). The PD provides that "any person offering services to exchange digital currencies either to fiat money or to another digital currency and vice versa will be subject to obligations on AM/TF". This includes the obligation to establish a policy on AM/TF which includes the duty of the person (or institution) to report any suspicious transactions, to conduct customer due diligence, to appoint compliance officer and other measures necessary to combat AM/TF.

CBM has also issued Financial Technology (Fintech) Regulatory Sandbox Framework in an effort to provide a regulatory environment conducive for the deployment of Fintech. Acknowledging the importance of cryptocurrency which is the bred of Fintech, as more adaptable to the new technological shift and new payment system mechanism, denotes the importance of regulation in this aspect. Not only the Fintech or cryptocurrency companies need to get approval from CBM to operate their business, the companies must also prove that their products and services are useful, functional and compatible with laws and regulations; the companies have sufficient resources and expertise to mitigate and control potential risks; and the companies are led and managed by persons with credibility and integrity.

The two regulations issued demonstrate CBM's trajectory in regulatory approach towards cryptocurrency and Fintech in general, in ensuring that its operations and activities do not disrupt sound financial and business practices; promote fair treatment of consumers; and promote safety, reliability and efficiency of financial systems. It is also interesting to note that the regulation also emphasis innovative solutions offered by digital currencies for Islamic financial services must be consistent with prevailing Shari'ah principles.

Canada

Governor General of Canada gave his royal assent[3] to Bill C-31 that includes amendments to Canada Proceeds of Crime (Money Laundering) and Terrorist Financing Act.[4] This will treat (any form of) virtual currency as money service business for the purpose of its Anti-Money Laundering Law. The immediate implication of the law is that companies in Canada dealing with virtual currencies and companies outside Canada dealing directly with person or entities in Canada have to register with Financial Transaction and Report Analysis Centre of Canada (FINTRAC).[5]

The Financial Consumer Agency of Canada does not recognize cryptocurrency as legal tender and declares that the central authority does not legally support the digital currency, nor the financial institutions manage the oversight of the digital currency businesses. It is also clearly pronounced by the government that digital currency/cryptocurrency is not exempted from Canadian tax obligation and thus rendering it subject to Income Tax Act.

[3] Royal assent is the final step required for parliamentary bill to become law.

[4] See Division 19 of Bill C-31: Money Laundering and Terrorist Financing, Amendment for Proceeds of Crime (Money Laundering) and Terrorist Financing Act, (2006), c. 12, s. 3(1), http://www.parl.ca/DocumentViewer/en/41-2/bill/C-31/royal-assent/page-344#37.

[5] Jasper Hamill, Canadian Regulators Welcome US Bitcoin Refugees with Open Arms, REGISTER (May 20, 2013), http://www.theregister.co.uk/2013/05/20/canada_welcomes_bitcoin_traders_fintrac_letter/.

European Union (EU)

European Union has not calibrated specific regulation for virtual currency as a currency, because they view that virtual currency is more suitable to be an investment vehicle rather than a currency, due to its high volatility.[6] However, it is notable that Council of European Union has proposed an amendment to the definition of virtual currency in the 4th Anti-Money Laundering Directive (4AMLD), which is later been suggested to issue as a separate Directive that will establish in the form of the 5th Anti-Money Laundering Directive (5AMLD). Apart from that, European Central Bank (ECB) has published two reports in 2012 and 2015, stating that ECB does not recognize virtual currency as a legal tender.[7]

On December 13, 2013, the European Banking Authority (EBA), the regulatory agency of the EU responsible for advising EU institutions on banking, e-money regulation and payments, issued a warning on the dangers associated with transactions, such as buying, holding or trading virtual currencies. The EBA pointed out that since the bitcoin is not regulated, consumers are not protected and are at risk of losing their money and that consumers may still be liable for taxes when using virtual currencies.[8]

Australia

Australian Taxation Office has issued a guidance paper on taxation treatment of cryptocurrencies specifically on bitcoin. The supply of bitcoin is regarded as an asset for capital gains tax (CGT) and not for goods and services tax (GST) purposes.[9]

Apart from that, Australia has also introduced new guideline (effective 3 April 2018) that incorporates requirement for cryptocurrency exchanges and service providers to register their business and to furnish

[6] European Central Bank, *Virtual Currency Schemes* (Brussel: ECB, 2015), 23.

[7] Ibid.

[8] Press Release, European Banking Authority, EBA Warns Consumers on Virtual Currencies (December 13, 2013), http://www.eba.europa.eu/-/eba-warns-consumers-on-virtual-currencies.

[9] Australian Government (AUSTRAC), "Digital Currency Exchange Providers: Register Online with AUSTRAC", http://www.austrac.gov.au/news/digital-currency-exchange-providers-register-online-austrac (accessed April 16, 2018).

the necessary reporting related to arising suspicion of money laundering activity. Track records of 7 years are expected for the businesses to retain their credibility and to showcase a trail of good performance.

United States of America (USA)

In USA, the Internal Revenue Service (IRS) has issued Virtual Currency Guidance stating that virtual currency shall be treated as property for US federal tax purposes.[10] Further, the US Anti-Money Laundering Agency known as FinCEN (Financial Crimes Enforcement Network)[11] suggests that activities that are classified as Money Services Businesses (MSB)[12] and Money Transmission Businesses (MTB) should be applied equally to both real currency and virtual currency. Following that, FinCEN has published guidance that further defines the parties who are considered performing MSB are the administrator or exchanger of virtual currency and money transmitter that are bound to FinCEN regulation.

The Commodity Futures Trading Commission (CFTC) appears to be at the forefront in making the clarion call to market players on its mandate to regulate cryptocurrency trading, especially in derivatives market.[13] In 2018, it appears to be the first regulator to allow for trading

[10] See *The Internal Revenue Service's Virtual Currency Guideline*, https://www.irs.gov/uac/newsroom/irs-virtual-currency-guidance.

[11] FinCEN function is to safeguard the US financial system from illicit use and combat money laundering and promote national security through the collection, analysis and dissemination of financial intelligence and strategic use of financial authorities. FinCEN exercises regulatory functions primarily under the Currency and Financial Transactions Reporting Act of 1970, as amended by Title III of the USA PATRIOT Act of 2001 and other legislation, which legislative framework is commonly referred to as the "Bank Secrecy Act" (BSA). See https://www.fincen.gov/.

[12] Money Services Businesses (MSB) as defined in US Bank Secrecy Act Regulation—Definitions and Other Regulations Relating to Money Service Businesses is "A person wherever located doing business, whether or not on a regular basis or as an organized or licensed business concern, wholly or in substantial part within the United States, in one or more of the capacities listed in paragraphs (ff)(1) through (ff)(7) of this section. This includes but is not limited to maintenance of any agent, agency, branch, or office within the United States", https://www.law.cornell.edu/cfr/text/31/1010.100 and https://www.gpo.gov/fdsys/pkg/FR-2011-07-21/pdf/2011-18309.pdf.

[13] Matthew Kluchenek, "Bitcoin and Cryptocurrencies: Welcome to Your Regulator", *Harvard Business Law Review*, 2016: 1–2.

of cryptocurrency derivatives.[14] This sends a signal to the global market that cryptocurrency can be recognized as the new asset class for investment purposes. The CFTC would ensure that it is at the best interest of consumer protection that such allowance is taken place. Conversational dialogue is continuously conducted with relevant cryptocurrency exchanges involved to maintain a certain threshold of quality market conduct for derivatives businesses. USA does not have a dedicated provision or regulation concerning cryptocurrency, rather it is much dependable on the regulatory agencies governing the sector/activities.

Japan

Japan made an amendment of Payment Services Act effective June 2017 that includes the virtual currency exchanges regulation.[15] The amendment allows for virtual currency business to register to Financial Services Agency for the purpose of licensing.[16] Japan is seen to take an extra prudential measure in regulating virtual currency activities because of the experience from Mt Gox collapse in 2014.[17] Apart from that, as for the tax treatment, consumption tax on cryptocurrency such as bitcoin is now exempted according to Fund Settlement Law and replaced with taxable capital gains tax (CGT) as, in this case is bitcoin, is viewed

[14] Robert Schimdt, "Bitcoin-Futures Regulator Clears Employees to Trade Crypto Coins", *Bloomberg News*, https://www.bloomberg.com/news/articles/2018-02-28/bitcoin-futures-regulator-clears-employees-to-trade-crypto-coins (accessed May 3, 2018).

[15] Yuri Suzuki and Ryosuke Oue, "Fintech Legislation in Japan", *Global Banking and Financial Policy Review*, 2016.

[16] Sayuri Umeda, *Japan: Bitcoin to be Regulated*, http://www.loc.gov/law/foreign-news/article/japan-bitcoin-to-be-regulated/ (accessed July 21, 2017).

[17] Mt. Gox is a bitcoin currency exchange based in Tokyo. It is one of the various unregulated cryptocurrency exchanges existing in the cryptocurrency ecosystem. The collapse of Mt. Gox in 2014 was preceded with several suspicious trading activities that were leaked from the data dump that shows Mt. Gox transaction history that caused the bitcoin rate during that time experienced a high spike in price due to the fraudulent transaction. In early 2014, Mt. Gox folded because of insolvency. Mt. Gox collapse is an example of how manipulation triggers volatility in bitcoin price that later can actually backfire the actor of the fraudulent activities (Neil Gandal, JT. Hamrick, Tyler Moore and Tali Oberman, "*Price Manipulation in Bitcoin Ecosystem*", Workshop on the Economics of Information Security [WEIS], 2016).

as being an asset-like.[18] Japan is said to be a positive precedent in Asia region in coming out with an official statement and calibration of regulation in regards to cryptocurrency.

Apart from that, due to the heightened heist and theft risks that cryptocurrency exchanges may be exposed to, Japan is now exploring to set up the self-regulatory body of the individual cryptocurrency exchanges to bolster public confidence and trust. The clampdown that had taken place in few cryptocurrency exchanges in Japan had prompted them to become one of the first few countries to introduce licensing requirements for cryptocurrency exchanges. The introduction of licensing requirement is an important regulatory milestone because it enables the regulator to address money laundering and terrorism financing risk,[19] as it requires for identification of the contracting parties. Consumer's right and protection would also be better preserved when the licensing requirement is implemented to safeguard any moral hazard involving cryptocurrency transaction.

South Korea

South Korea cryptocurrency practice is a bit peculiar in nature, whereby cryptocurrency exchanges sat within banks in form of virtual bank accounts. In January 2018, the Financial Services Commission of South Korea introduces new cryptocurrency regulation that primarily highlights the compliance with AML Act and Know Your Customer (KYC) policy.[20]

Under the ambit of the new regulation, the Government aims to reduce the avenues of cryptocurrency being used for illicit activities and businesses, as well as price manipulation and speculation. It also only allows for cryptocurrency trading from real-name bank account from a real account, rather than just manipulating the bank platform.

[18] Kevin Helms, "Japan Declares Sale of Bitcoin Exempt from Consumption Tax", *Bitcoin News*, https://news.bitcoin.com/japan-sale-bitcoin-exempt-consumption-tax/ (accessed July 21, 2017).

[19] Takashi Nakazaki and Ken Kawai, "Development of Legal Framework for Virtual Currency in Japan", *Anderson Mori & Tomotsune Law*, 2016: 2.

[20] Chrisjan Pauw, "South Korea and Crypto Regulation: Explained", *Coin Telegraph*, February 6, 2018, https://cointelegraph.com/explained/south-korea-and-crypto-regulations-explained (accessed April 16, 2018).

This new imposition is also aimed to minimize AML and tax evasion risks, which are the initial concerns of what prompted the calibration of the regulation.

United Kingdom (UK)

The Financial Conduct Authority (FCA) does not have a regulatory scope over cryptocurrency. As such, there is no guideline issued concerning cryptocurrency/virtual currency, making it as a clearly unregulated market in the UK.[21]

Although there is no clear guideline or regulation crafted to address regulatory measure on cryptocurrency, the FCA has issued a series of Consumer Warning to alert people on risks associated with cryptocurrency dealings. Recently, a Consumer Warning on Initial Coins Offerings (ICO) was published,[22] mainly highlighting the unregulated nature of ICO poses consumer to a higher exposure of scam and fraud.

In addition to that, similarly in other jurisdiction, regulatory concern is prompted to address the risk of money laundering and terrorism financing. The UK Treasury did state in a press statement that they are mulling over to bring virtual currency exchange platform within the AML and Counter-Terrorist Financing regulation.[23]

From the development in regulatory responses of countries across the globe, three observations can be derived. Firstly, most countries are not recognizing cryptocurrency as a currency holding the legal tender, instead perceiving it as a property or financial asset that comes along with tax consequences. Secondly, it is apparent that regulators approach in recognizing cryptocurrencies as property or financial asset that attracts taxable capital gain is actually one way to regulate cryptocurrency dealings. Thirdly, notwithstanding the associated risks surrounding

[21] Edward Robinson, "U.K. Starts Cryptocurrency Inquiry as Lawmakers Weigh Regulation", *Bloomberg News*, February 22, 2018, https://www.bloomberg.com/news/articles/2018-02-22/u-k-starts-cryptocurrency-inquiry-as-lawmakers-weigh-regulation (accessed May 2, 2018).

[22] See UK Financial Conduct Authority's Consumer Warning on ICO and Other Issuance, https://www.fca.org.uk/news/statements/initial-coin-offerings.

[23] Shafi Mussadique, "UK Government Plans Bitcoin Crackdown Amid Money Laundering Concern", *The Independent (UK)*, December 4, 2017, https://www.independent.co.uk/news/business/news/uk-bitcoin-regulation-money-laundering-crytocurrency-european-union-eu-a8090791.html (accessed May 1, 2018).

cryptocurrency ecosystem, regulators are attempting to promulgate regulation without stifling innovation happening around the financial landscape. For example, registration of operators and licensing requirement is introduced instead of outright declaration on illegality of cryptocurrency. Apart from that, the regulatory guidance that most of the countries have issued are more for combating money-laundering that may be implicated in cryptocurrency activities.

Shari'ah Framework on Cryptocurrency

Cryptocurrency does not only penetrate the conventional financial system but also the Islamic financial system. If the questions of the financial stability and legal tender status are among the issues of concern in the financial system, another additional issue that needs to be reconciled for Islamic financial system is the Shari'ah compliant status of such currency. Shari'ah analysis needs to be made on the features of cryptocurrency before it can be allowed to be used and traded. There is hardly any conclusive deliberation on this matter either in the form of fatwa issued by the scholars or standard issued by Islamic authority on this matter. Relying on the fatwa preliminarily issued by the scholars' cryptocurrency, the following discussion analyses the features of cryptocurrency and its validation process to examine its status from Shari'ah perspective.

Fatwa on Cryptocurrency

There are a few *fatwa* issued in regards to cryptocurrency and its validity from Shari'ah aspects.

Firstly, National Fatwa Council of Malaysia has issued statement on bitcoin.[24] The Council views that bitcoin is not suitable to be used as a currency because it is vulnerable to high volatility and fluctuation as well as the speculation that affects its price. Bitcoin or cryptocurrency, is a virtual currency exchanged in a virtual platform and thus may have an issue of possession (*qabdh*) which is required in the transactions. If

[24] Majlis Fatwa Kebangsaan, Hukum Penggunaan Bitcoin Sebagai Medium untuk Bermuamalat, *e-fatwa Majlis Fatwa Kebangsaan*, April 2, 2014, https://web.archive.org/web/20150122215500/http:/www.e-fatwa.gov.my/blog/hukum-penggunaan-bitcoin-sebagai-medium-untuk-bermuamalat.

cryptocurrency was to be treated as currency, it has to satisfy the requirement of currency exchange (*ahkam sarf*).

Secondly, Monzer Kahf has concerns on the manipulation in the price of cryptocurrency[25] given the fact that there is no authority governing it. From Shari'ah perspective, cryptocurrency is permissible for exchange and traded if the transaction satisfies the rule of spot delivery in dealing with currency. However, there should be no speculation in obtaining and disposing the coins.

Third, the Council of Scholars in Syabakah Islamiyah Fatwa, Qatar also has issued fatwa on cryptocurrency stating that[26]:

> Virtual currency is a currency in a virtual form and not in the form of paper money or commodity. So exchanging virtual currency with other currency is considered a currency exchange transaction (sarf). And currency exchange transaction (sarf) requires spot delivery and at par exchange if it involves the same denominator. If it is different denominator, it requires spot delivery without the requirement of at par exchange.

Fourth, Sheikh Dr. Abdul Sattar Abu Ghuddah[27] is of the view that currency issuance and dealing is the centralized prerogative and mandate of the government (*wali al-amr*). Secondly, the harm (*darar*) associated with cryptocurrency may render it to impermissibility because it may ensue more detrimental repercussion at national and individual level. This is to ensure consumer protection and financial stability soundness, which cryptocurrency ecosystem would not be able to preserve.

Based on the *fatwa* and statements given regarding cryptocurrency, it is apparent that scholars are giving their opinion on the basis that cryptocurrency is a form of currency thus attaching the rule of dealing in *sarf* to it. As such the rules on possession (*qabd*),[28] spot delivery and exchange; and speculation (*taghrir*) are to be carefully considered.

[25] See Monzer Kahf, *Fatwa*, http://monzer.kahf.com/index.html.

[26] See Fatwa Syabakah Islamiyah, No. 251170, http://fatwa.islamweb.net/fatwa/index.php?page=showfatwa&Option=FatwaId&Id=251170.

[27] Abdul Sattar Abu Ghuddah, *al-Nuqud al-Raqamiyah al-Ru'yah al-Syar`iyyah wal Athar al-Iqtisodiyah* (Doha, 2018), 24–25.

[28] There are two types of possessions recognized in Shari'ah that are real possession (*qabd haqiqi*) and constructive possession (*qabd hukmi*). *Qabd hukmi* is defined as taking possession in physical form or when the buyer is observed taking goods sold to him. On the other hand, *qabd hukmi* is a legal possession that refers to taking possession implicitly or

Shari'ah Analysis on Cryptocurrency

In understanding cryptocurrency from Shari'ah perspective, it is instrumental to determine what is currency from Shari'ah standpoint and what function it entails.

Ibn Abidin views that currency must have a store of value and that it is being transacted and exchanged regardless of the economic condition that affects the value of the currency.[29] If it involves an exchange of currency against another currency, it should adhere to the rule of *ribawi* items, whereby the exchange should be on spot basis and of the same weight. This view is similar to Ibn Qudamah that mentioned currency in Shari'ah perspective should be treated carefully to not be susceptible to the practice of *riba*.[30]

Al-Ghazali[31] is of the opinion that a currency should incorporate the function of being medium of exchange and measure of value. He emphasizes that the essential characteristic of money is not desired because of the money; rather it is desired because of the function it performs. To be accepted as the medium of exchange, currency must have a certain measure of value recognized by the people doing the transactions with it.

Ibn Taymiyah echoes this view[32] stating that currency serves two main functions, which are to measure the value of goods and to be paid in exchange for different type and quantities of goods.[33] A currency is fundamentally the price (*thaman*) that is meant to be the measurement of an object of value (*mi'yar al-amwal*), through which qualities of the object (*maqadir al-amwal*) can be known.

not in physical form (Asyraf Wajdi Dusuki, Status of Ownership [*qabdh*] in Islamic Sale Contract, *Global Perspective on Islamic Banking and Insurance*, 175 [2010]: 22–23).

[29] Ibn Abidin, *Darr Al-Mukhtar wa Hasyiyah Ibn Abidin* (Beirut: Dar Al-Fikr, 1992), 534.

[30] Ibn Qudamah, *Al-Mughni li Ibnu Qudamah* (Cairo: Maktab Al-Kaherah, 1968), 39.

[31] Al-Ghazali, *Kitab Al-Shukr Ihya' Ulumuddin* (Beirut: Dar Al-Ma'rifah, n.d.), 90.

[32] Ibn Taymiyah, *Majmu' Fatawa*, ed. Abdul Rahman Ibn Muhammad (Madinah: Majma' Al-Malik Al-Fahd li Tiba'ah, 1995), 250.

[33] Abdul Azim Islahi, "An Analytical Study on Al-Ghazali's Thought on Money and Interest", *Munich Personal RePEc Archive*, 2001.

According to Taqi Uthmani,[34] a currency should satisfy two major prerequisites. Firstly, it should be used as a medium of payment and accepted as tools for settlement of debts. When that is being accepted to circulate within an economy, it can be considered as commonly acceptable currency (*awraq athmanan 'urufiyyah*). Secondly, it should also be legally recognized as a currency in one's jurisdiction (*'umlah qanuniyah*). The value of currency is derived from the recognition of the regulatory authority, thus creating public confidence to use it as medium of payment.

Apart from that, it is the responsibility of the government or the authority to guarantee the supply of the money and oversee the fluctuating value of the currency that will directly affect the purchasing power of the currency to unit of goods and services. Al-Ghazali underlines the alarming danger if the production is not wisely governed because it may lead to undesirable inflation that harms the purchasing power of the currency and the value that the currency entails. These phenomena accentuate the importance of the legal recognition and control from the monetary authority. Legal cognizance on the currency mitigates the erosion of the value, providing standardized currency to be used as the medium of payment, and thus benefits the *ummah*.

Supporting this view, Monzer Kahf stated[35] that regulatory intervention is instrumental in order to regulate inflation and deflation that may influence the purchasing value of the currency.

From the above discussion, there are four prerequisites that can be extracted to be the constituency of currency in Shari'ah perspective. Those are (i) currency is to perform the function as the medium of exchange for trading goods and services (ii) currency is to have a store of value; (iii) currency is to be commonly accepted as the currency circulating within a community; and (iv) currency is to be recognized as legal tender in a jurisdiction.

The technological landscape now allows people to trade goods and services using cryptocurrency for payment and commercial transaction purposes. It serves as a new platform that has become popular and

[34] Taqi Uthmani, *Buhuth fi Qadhaya Fiqh Muasorah* (Damsyik: Dar Al-Qalam, 2003), 157.

[35] Monzer Kahf, *The Islamic Economy: An Analytical Study of the Functioning of the Islamic Economic System* (Canada, 1978).

acceptable. This displays public trust and confidence on its reliability to secure their payment and to retain its value. Not only it is utilized for commercial purposes, but also it has become an alternative mode of saving and investment, depending on risks associated with it. This indicates that cryptocurrency could store wealth and value that the coin possesses. Further, the reliability of cryptocurrency to be the medium of exchange also implies the ability of storing value because it can be used to measure the value of goods and debt in relation to time.

Cryptocurrency is transacted and exchanged within a virtual community of network that together using the common currency for exchange. Users of cryptocurrency are required to enter the network by signing up as the new participant without the need for further identification details. From this perspective, cryptocurrency seems to fulfil the prerequisite of being commonly acceptable within a community within the context of *`uruf* practiced because every participants signing up in the network is utilizing the common currency for exchange and trading.

On the prerequisites of currency stated by the fatwas, the feature of cryptocurrency satisfies the requirement of medium of exchange in a sense that the validating protocol allows users to use cryptocurrency as means of payment between transacting parties within a virtual community network. The coins are satisfied to set off payment and measuring value of goods traded or exchanged. Cryptocurrency also qualifies as a currency having store of value as the stringent validating mechanism allows users to retain the value of currency and its value would appreciate and depreciate similar like other acceptable currencies. The fluctuation of value can be benefited through acquiring and disposing coins for value. Cryptocurrency is also commonly acceptable within the virtual community network that uses the common currency for exchange.

Shari'ah Analysis on Cryptocurrency Architecture and Algorithm

Cryptocurrency is a type of virtual currencies that is designed to incorporate and exchange digital information through a cryptography process.[36] The default architecture of cryptocurrency comprises of the validating

[36] Cryptography is a process of converting ordinary plain text and syntax into unintelligible text and vice versa, which is what to be known synonymous to encryption and decryption (Lathan and Watkins LLP, *Cryptocurrency: A Primer* [New York, 2015]).

system, mathematical algorithm and coin supply protocol that differ from one cryptocurrency developer from another. The following discussion provides a brief discourse on these aspects to determine the Shari'ah permissibility on cryptocurrency.

Validating System

Validating system is the method used to validate transaction performed across the network using cryptocurrency. Validating methods chosen will determine how the network will reach consensus for transaction validation and thus will be appended as the new block into the blockchain. Notwithstanding the methods adopted by the cryptocurrency developer whether it is Proof-of-Stake (POS),[37] Proof-of-Work (POW)[38] or Proof-of-Retrievability (POR),[39] there will be some time lapse needed for the network to reach consensus and validate the transaction for the coin transferred can be acquired or possessed at the receiver's end. For instance, cryptocurrency with POW validating method would rely on the miners' speed and computational capability to solve the hash algorithm. Normally it takes 10 minutes in bitcoin operational structure for miners to solve the mathematical problem,[40] and it could be stretched longer as time progresses due to the intensified complexity of the function. It is to note that the transacting parties have actually concluded the transaction; it is just the protocol of the system to verify the transaction to ensure security and authenticity of the transaction made.

[37] *Proof of Stake*: A mining concept that states that a person's ability to mine or validate blocks is according to how many coins he holds. The more coins he holds, the more mining power he is entitled to. Hence, the 'stake' he has in the mining power.

[38] *Proof of Work*: The original mining concept in Bitcoin system. It relies on the miners' effort to compete against one another to complete transaction and get rewarded. The main working principle is a complex mathematical puzzle, hence the 'work' needed to solve the puzzle.

[39] *Proof of Retrievability*: It is a protocol, which enables clients to retrieve 'files' from an 'archive', which ensures an accompanying digital signature can be checked accordingly to confirm authenticity of a transaction.

[40] Jason Teutsch, Sanjay Jain and Prateek Saxena, "When Cryptocurrencies Mine Their Own Business", *Financial Cryptography and Data Security* (2016): 499–514.

This currency exchange mode is important to be examined in view of the Shari'ah requirement of spot basis transaction in currency exchange (*bai' sarf*).[41] The scholars have allowed 3 days (T+2) settlement period of foreign currency exchanges, recognizing that transaction as being "spot transaction". The T+2 is deemed as spot although the delivery and settlement is delayed from the day the contract is being concluded, because the 48-hour period is the time needed for transaction confirmation.[42] The permissibility of the T+2 transactions can be seen in the resolution of Shari'ah Advisory Council (SAC) of Central Bank of Malaysia where it stated that:

> The SAC, in its 38th meeting dated 28 August 2003, has resolved that the delivery and settlement of a spot foreign exchange transaction based on T+2 is permissible.[43]

In the case of cryptocurrency, it would take less than three days so it bears no issue as far as the spot transaction requirement is concerned.

Another Shari'ah requirement for all types of transactions including currency transaction is that the parties must have possession (*qabd*) of the asset/currency. In the transaction performed using cryptocurrency, constructive possession takes place and thus it poses no Shari'ah issue. Once the transaction is validated and added into the block, the coins received by the user that is stored in their digital wallet can be exchanged and cleared at clearing houses. For example, clearing houses for bitcoin provide services to exchange bitcoin into any currency according to the market rate. Therefore, there is confirmed possession of the currency when it is stored in the respective users' digital wallet. As for exchange involving commodity, the commodity could also be possessed and delivered to the users pursuant to the exchange been made. In this context,

[41] In transaction involving currency with same denomination, it shall be in an equal amount and there shall not be deferment in delivery of one or both counter values (AAOIFI Shari'ah Standard, *Dealing with Currencies*, Standard No. 2/1/2 and No. 2/1/3).

[42] Bahroddin Badri, "*Qabd* (Possession): An Overview", *Bloomberg Finance*, June, 2015.

[43] Bank Negara Malaysia, *Shari'ah Resolutions in Islamic Finance* (Kuala Lumpur: BNM, 2010), 138.

cryptocurrency is in fact the medium of exchange across the virtual network for the acquisition of identified commodity or asset.

Mathematical Algorithm

Mathematical algorithm is very much connected to the validating system, which determines the digital security of the transaction using cryptocurrency. It signifies the mathematical procedure for data calculation and processing. Processing data, speed of blocks adding and coins release are determined by the mathematical algorithm being applied. The mathematical algorithm is the factor that can ensure the reliability of the cryptocurrency system. The incorporation of hash function that could not be reverse engineered and the blockchain concept that makes the information hardly to be altered and modified renders the system to be secured and accountable.

Some cryptocurrencies such as bitcoin, peercoin and namecoin use SHA-256 as the mathematical algorithm. SHA-256 is a cryptographic hash algorithm that generates fixed length of 256-bit hash value. This ensures the security of the information in the transaction and for the purpose of validation and verification, because hash value, once it is being encrypted to generate a digest (output), it is not irreversible and is not revocable into the same hash algorithm even when the hash function mechanics is known.

Monzer Kahf has expressed his concern that when the public confidence of virtual currency collapses, the accounting or settlement system of it crumbles because cryptocurrency relies on the network to keep it continuously operating. However, the mechanics of the mathematical algorithm used in cryptocurrency seems to refute the concern it defines the reliability and security of the system. Therefore, it renders cryptocurrency to be accepted and public confidence is stored towards it, thus addressing the concern on the depletion of public confidence when the system crumbles and becomes unreliable.

Coin Supply

There are three categories of cryptocurrency coins supply; which are fixed number of supply, flexible number of supply and premined coins supply. Fixed number of supply entails a finite and limited supply of coins that could be mined in the system (example: bitcoin). Flexible number of supply, on the other hand, does not fix a hard limit on its supply but rather it is designed to eventually attain an annual inflation rate of 1%. Therefore, the mining of the coin is flexible and adjusted according to achieve the desired rate (example: Peercoin).[44] Premined coins supply is a readily mined coin that will be further distributed according to the schedule until it reached the maximum cap of the supply (example: Aureus).[45]

In the context of coin supply and production, there are few Shari'ah issues that may come along and require further attention.

Coin supply or production in cryptocurrency is done through the mining process that involves the real investment of computational power and energy by the miners. Miners solve the POW puzzle to be appended on the chain, which signifies the computational effort that has been invested (Teutsch, Jain and Saxena 2016). Mining is a process of generating new coins, thus it reflects the physical endeavour and power involved in the process. The computational effort also implicitly embodies the amount of watts and energy required to solve the hash problem. The quantum of watts and energy required is the item that brings value to cryptocurrency within the context of its coins production, because it involves the real resources of computers and power.

Therefore, it is observed that the computational energy represented by the power and watts needed are the intangible value in cryptocurrency coins production. The miners would be compensated because the coins generated through the hash problem solved are represented by a real and valid assets and investment. Mining activity is considered as a venture that the miners chose to participate resulted to more assets to be produced and circulated within the network. Mining activities ensure the maintenance of the network.

From Shari'ah perspective, authority for money production resides with the monetary authority or the government. The requirement is set to prevent future harm when the permission is given to anyone in unregulated manner and thus leading to price instability. Having one central authority to produce money that is used as medium of payment is part of attaining *maslahah*. The role of the authority to guarantee the value of the currency and its supply is instrumental as far as the

[44] European Central Bank, *Virtual Currency Schemes*, 11.

[45] See Aureus official website, http://aureus.cc.

money/currency production is concerned. Without such guarantee, the currency ceases to function as the medium of payment and as the tool to establish and extinguish debt, because there is no inherent value in the currency anymore. Without aforementioned role or function of the regulator, it would create a greater harm instead of positive effects. For instance, unregulated supply of money can affect the value of money, and unsupervised market forces result in volatile price fluctuation. Therefore, although any form of money is permissible to function as a currency for medium of exchange, the existence of the imminent harm would deflect the foundation of permissibility given.

The cryptocurrency supply or production is hard to regulate because the network is self-regulated in a way that it is not centrally administered. For example, a severe depletion in bitcoin price occurred during Mt. Gox collapse, which results in the users' huge chunk of loss.[46] The greatest lesson from the colossal collapse is the decentralized nature of cryptocurrency that made it possible for anyone to enter the market without central administration on the quantum of supply and demand interaction. Apart from that, the collapse also proved that although the technology is reliable and secured, the absence of regulatory measure has resulted in the loss of people's money in the Mt. Gox exchange, which has eventually cause the diminishing of the bitcoin price.

Shari'ah Analysis on Legal Tender

Legal tender is a tender of payment that by virtue of the law, it could not be rejected in a settlement of debt denominated in the same currency.[47] It is an object confers the right to user to use it as the medium of payment, exchanges and discharge of contract with the other transacting parties.[48] Legal tender is essentially the legal foundation of the monetary system which is accorded based on each jurisdiction of the country. The currency in the country that is accorded the legal tender status is thus the "lawful money" in the country.

[46] Gandal, Hamrick, Moore and Oberman, "Price Manipulation in Bitcoin Ecosystem", 4–5.

[47] Nick McBride, "Payment and Concept of Legal Tender", *Reserve Bank of New Zealand*, 70 (2007).

[48] Dror Goldberg, "Legal Tender", *Bar-Ilan University Working Paper*, 2009.

Having the legal tender title would make the cryptocurrency not only a legal currency of the country but also it is consistent with market movement and volatility, simply because there would be an authority oversees the fluctuation and maintain the currency value in order to avoid harmful depreciation in its value. Without such recognition, cryptocurrency ceases to fulfil the prerequisite of performing the function of legal currency, and thus upsetting the confidence of the public.

Having possessed all the attributes explained above, contemporary scholars, however, are concerned about the absence of cryptocurrency's status as a legal tender. Sheikh Taqi Uthmani and Monzer Kahf emphasized on the need of government or monetary authority's recognition of the cryptocurrency to regulate the fluctuating value of the currency; evade the inflation and deflation risk that may harm the value of the currency and the underlying purchasing power it holds. That is the *maslahah* that cryptocurrency failed to achieve by not having the legal tender status.

The public confidence could not be instilled only through showcasing a reliable and secure network system; it comprises also the price stability of the currency because that affects the value that currency holds. Despite the ability to offer a reliable virtual network of cryptocurrency exchange and fulfilling the three prerequisites of currency (medium of exchange, store of value, commonly acceptable), cryptocurrency still pose considerable risk in terms of the high volatility of its price.

The Shari'ah approved currency should originate from the authority of the government so the necessary regulatory and prudential measure can be taken to ensure its stability and thus serve its purpose for the community. This is what is meant by the real *maslahah*.

Conclusion

Cryptocurrency seems to satisfy the prerequisites of currency from Shari'ah perspective except the legal tender status. From the deliberation made, it seems that legal tender stands out to be the most important prerequisite for currency to be recognized from Shari'ah standpoint. Having the legal tender title would make the cryptocurrency practice consistent with market's movement and volatility, because there would be an authority oversees the fluctuation and maintain the currency value in order to avoid harmful depreciation of its value. The cryptocurrency that performs as the means of payment without legal tender status accorded to it may pose considerable risk for the regulators, users and economic ambience as a whole.

This is congruent to the contemporary scholars' view that emphasizes the importance of having the legal recognition for the currency used as the medium of exchange and means of payment. This study observes that cryptocurrency features in the context of its default architecture capturing the validating mechanism, mathematical algorithm and coins supply fulfil the prerequisite of currency from Shari'ah perspective. However, the issue that is brewing still is the absence of legal tender status in cryptocurrency that may pose risk and problem in the eyes of Shari'ah.

Both the validating mechanism and mathematical algorithm that serve as the default architecture of cryptocurrency could offer security and reliability to the virtual community or users of cryptocurrency, but cryptocurrency is still vulnerable to the external market factor that would affect the price value of the coins being exchanged. Despite the stringent cryptocurrency architecture that would supply coins to its users through mining protocol being employed, the value of cryptocurrency is still prone to high volatility due to the absence of regulatory measure taken to control the price of the currency. With such fragility, it seems that cryptocurrency does not satisfy the prime prerequisite of currency that has been highlighted by fatwa of the scholars.

Echoing the contemporary scholars view on the importance of legal tender on top of the currency being accepted as the medium of exchange and can store value, this study agrees that cryptocurrency features comply the prerequisites of currency recognized in Shari'ah standpoint. It is however found in the absence of legal tender title, the three initial prerequisites would cease to function because of the considerable risk that may surface when there is no regulatory measure.

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