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Legality of Cryptocurrency from An Islamic Perspective: A Systematic Literature Review

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Introduction

People often only consider paper notes and coins as money, but in reality, money refers to anything that is an acceptable mode of payment for goods, services or debts. Money is thought to be a medium of exchange, a unit of account and a store of value. Money, being a medium of exchange, establishes a high degree of economic efficiency. Money thus needs to be standardized, widely accepted, stable, durable, and mobile. The current monetary system is unable to fulfill the primary functions of money being a unit of account and store value. Thus, in the economy, a currency must achieve these functions in order to stimulate stability (Peie et al., 2017).

What is Cryptocurrency?

Transactions over the Internet rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments and the cost of this mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions. The solution to this problem lies in cryptocurrencies which are decentralized currency schemes based on cryptography. This enables users to provide virtual payment for goods and services free from a central trusted authority. Cryptography is a way of encoding messages or making them unintelligible to unfamiliar eyes. Bitcoin is an open source, peer-to-peer digital currency that was first proposed in a white paper published under the name of Satoshi Nakamoto in 2008. Nakamoto stated that financial institutions have been relied upon almost exclusively as trusted third parties for processing electronic payments for commerce on the Internet. While the current system works well enough for most transactions, it still suffers from the intrinsic deficiency of the existing model (Nakamoto 2008). Further, the rewarding mechanism through which Bitcoin is created is called "mining". For Bitcoin to be "mined", a process of sophisticated mathematical problem solving must occur and this becomes increasingly complicated over time, as the maximum number of Bitcoins is limited to 21 million.

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In the Bitcoin network, money is not in a physical form, but rather it is "mined", using widely distributed computing power. The "miners'" are operated autonomously by members of the network, using software built to support the initial algorithm. The system's sophistication lies in the fact that it produces Bitcoins. The mining network also handles the exchange of Bitcoins between currency holders (Nakamato 2008). In researching cryptocurrencies, three different meanings have been observed: Bitcoin the currency, Bitcoin the protocol and Bitcoin the transaction network. However, "cryptocurrency" in this paper refers to the currency unit, while the other meanings are referred to directly.

The different meanings of Bitcoin are explained as follows: Bitcoin (the currency) users depend on the Bitcoin protocol to receive and send payments over the Internet (Brito & Castillo 2013). Participants who want to buy and sell using Bitcoins then connect to a peer-to-peer network (transaction network). The Bitcoin network is based on the Bitcoin protocol (Meiklejohn et al. 2013). To avoid double-spending of Bitcoins, each transaction is verified by Bitcoin network nodes or "Miners", who have to solve a complicated mathematical problem. The Miner who succeeds first includes the transaction in a publicly available ledger and gets rewarded with Bitcoins (Nakamato 2008). Therefore, as the encryption, verification and transfer for each transaction is based on the Bitcoin protocol and transactions are publicly available through the ledger that is shared by nodes in the network, neither individual actors nor any central institution is needed for conducting a transaction (Maurer et al., 2013).

What is Meant by 'Shariah - Compliant'?

'Shariah' refers to activities that comply with the teachings of the Islamic religion, also known as Shariah law (the divine law). All the transactions should be free from prohibited elements, such as *riba* (usury), *gharar* (speculation or unreasonable uncertainty) and *maisir* (gambling). The main source in Islamic law is the *Qur'an* and the *Sunnah* (the teachings and practices of the holy Prophet Mohammad) (Bakar et al., 2017).

The focus of this review is to map all research papers regarding the legality of cryptocurrencies from an Islamic viewpoint, with an emphasis on Bitcoin as the most widely used cryptocurrency, which we believe requires a summarization in order to identify whether or not it is compatible with Islamic law since there have been no prior systematic literature reviews on this matter. The following questions form the basis for this review:

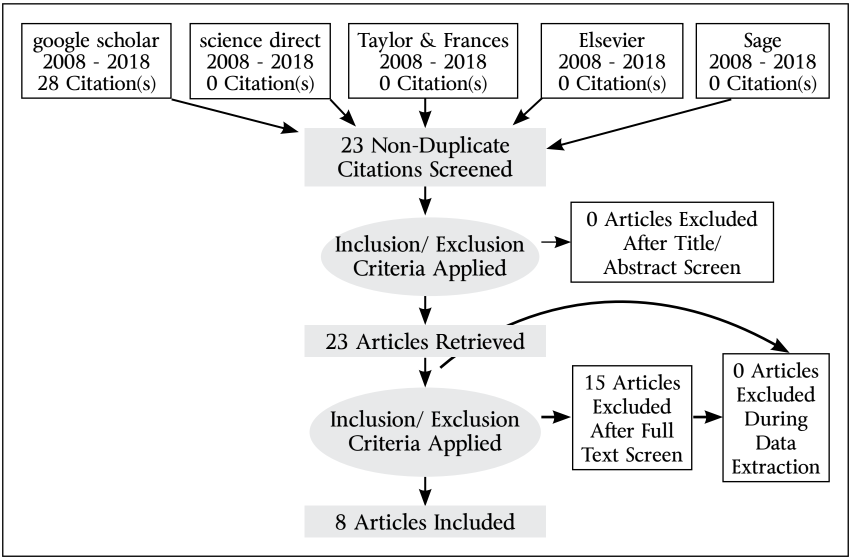
1. What is the opinion of Muslim scholars on the permissibility of cryptocurrencies in Islam?
2. What aspects have been addressed until now and which gaps remain to be covered?

This literature review is divided into four sections. Section 1 gives a brief overview of money in general and Islamic law. In the second section, we outline the methodology for the literature review and then present its results in section 3. Finally, a conclusion is drawn and the literature review limitations are discussed.

Systematic Literature Review

The reporting of this systematic literature review was based on the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines. An overview of the process used to identify the articles in this study is illustrated in Figure 1 and is described in the following. Firstly, the following search terms have been used: "cryptocurrency" AND "compatibility with Islamic law" OR "in compliance with Islamic law" OR "legality from the Islamic perspective" OR "Islamic law "OR "Islamic perspective" OR "Shariah law "OR "Islamic perspective" OR "Islamic view" and "Bitcoin" to obtain a comprehensive overview of the literature on cryptocurrencies from an Islamic perspective. The term "Bitcoin" was also included as Bitcoin is currently the most widely used cryptocurrency. The search terms "digital currency" or "virtual currency" were not used as our focus was on decentralized currency schemes based on a cryptography literature review. The time frame of the search was not restricted, but we did not expect to find much literature prior to 2008. These search terms were then used in the *Google Scholar, Science*

Figure 1
Flowchart of the Systematic Review



Direct, Taylor and Frances, Elsevier and Sage databases to identify relevant studies. To ensure that only quality publications were included, practical screening criteria were specified. More specifically, to be included in the review, papers had to (1) be published articles, (2) state the primary or secondary aim as assessing the compatibility of cryptocurrencies or Bitcoin from an Islamic point of view, and (3) be written in English. This was to address the main objective of the study in assessing the legality of cryptocurrency or Bitcoin from an Islamic point of view. A study was excluded if it did not contain data relevant to any of the above three criteria. As a result, the identified citations were reviewed in a two-stage process according to the established inclusion and exclusion criteria. Firstly, the titles and the abstracts of articles were screened. Then, the full texts of all identified articles were assessed. At the initial stage, a total of 25 articles was retrieved, and then five duplicates were removed. Additionally, "manual checks" for all the articles that fell within the search inclusion criteria were performed by reviewing the full text of the remaining ones. This resulted in removing 15 papers that clearly did not address the topic or that were outside of the scope of this paper, or, for example, the language of publication. Furthermore, an additional three studies were identified by examining the reference lists of the included articles. In fact, a point of saturation was considered to have been reached when the same articles continued to appear. Therefore, this systematic literature review is based on eight articles with a specific focus on cryptocurrencies from an Islamic perspective.

Our selected studies reveal an overall consensus among Muslim scholars towards the permissibility of cryptocurrency. Table 1 shows the critical results of included studies in this review. The Findings of each study were discussed. A careful review of the content of included articles indicates that all the arguments posed by those who condemn cryptocurrency as being not Islamic are weakly reasoned and could be managed through proper regulation. Moreover, all papers focus on validating or refuting whether cryptocurrencies have the characteristics of money or not, leaving out other aspects of money.

Table 1 summarizes the result of this literature review, which reveals that only two out of eight papers ground their research on the impermissibility of Bitcoin in Islam. The two papers provided almost the same argument against Bitcoin permissibility in Islam. According to Meera (2018), Bitcoin and cryptocurrencies are forbidden from the Shariah point of view as the Bitcoin inventor is unidentified; there is no central authority behind its issuance; it has no intrinsic value; and the high volatility of Bitcoin value makes it inconsistent with the store of value function of money, which is an important role for anything that plays the role of money in Islam. Moreover, the author claims that there is a direct link between money having an intrinsic value and monetary justice. According to the author, for any digital currency to

Table 1
Summary of Papers Included

Source	Argument	Findings
Meera, A. K. M. (2018)	• Lack of supervision; • Has no intrinsic value; • Has an element of both *maisir* and *gharar*; • High volatility; • The inventor is unknown.	Cryptocurrencies are not backed with real assets; therefore, Bitcoin is not Shariah- compliant.
Bakar, N. A., Rosbi, S., & Uzaki, K. (2017)	• Has no physical form; • Has no intrinsic value; • Difficulty of tracking the real account holder; • High volatility; • No central authority; • Vulnerability to hacking activity	Bitcoin transaction is classified as a transaction with high uncertainty (*gharar*)
Evans, C. W. (2015)	1. Performs the store of value function; 2. Cannot be inflated; 3. The way it is created is free of *riba*; 4. Incorporates the principle of *maslahah*; 5. Operated according to the principle of risk-sharing and cost-sharing (*musharakah*)	Bitcoin or a similar system might be a more appropriate medium of exchange in Islamic banking and finance than a riba-backed central bank fiat currency
Muedini, F. (2018)	1. The supply of Bitcoin is fixed, thereby eliminating any potential *gharar* (uncertainty) and inflation; 2. It cannot be altered, forged, or manipulated; 3. Removes any risk associated with a third-party control over one's money	Bitcoin and other digital currencies seem to be much more aligned with the principles of justice and social fairness, characteristics valued in Islamic jurisprudence

Table 1
Summary of Papers Included

Source	Argument	Findings
Abubakar, Y. S., Ogunbado, A. F., & Saidi, M. A. (2018).	**Proponent views:** • Bitcoin acquisition is permissible if it is done for the purpose of immediate payment for goods and services or currency exchange; • Bitcoin mining may be permissible if the goal behind it is noble; • Bitcoin cannot be forbidden based on its fluctuating value; • Bitcoin is recognized as a legal currency if allowed by governments; • Any commodity that may be used by a society as a means of payment may be perceived as money; • Bitcoin fulfils the condition of *mal* and is thus allowed as a means of exchange **Opposing views:** 1. It is neither a measure of value nor a monetary commodity; 2. Its valuation is open to speculation; 3. The Bitcoin issuer is anonymous; 4. It has no intrinsic value; 5. Bitcoin is considered a type of gambling as traders invest a lot of money to create Bitcoin with no guarantee of success as the miners try to solve mathematical puzzles in order to create Bitcoin; 6. Bitcoin is subject to high speculation; 7. No central authority; 8. Difficulty to track the real account holder if any suspicious activity occurs	The study found that Muslim scholars are divided on this issue. Some completely reject Bitcoin, while others believe Bitcoin does not contradict Islamic principles. These researchers tend to support the supporters' view

Table 1
Summary of Papers Included

Source	Argument	Findings
Asif, S. (2018)	1. The Proof of Work (PoW) protocol is *Halal* whereas the Proof of Stake (PoS) protocol is *Haram*; 2. The existing cryptocurrency derivatives found to be *Haram*; 3. The earnings resulting from an unlawful source (industry) are deemed *Haram*; the earnings resulting from a lawful source (industry) are deemed *Halal*.	The cryptocurrency ecosystem consists of both *Halal* and *Haram* elements
Oziev, G., & Yandiev, M. (2017)	Bitcoin complies with the following requirements of Shariah: 1. The emission process, including its supply to and withdrawal from the money market should be free from *Riba*; 2. Nature of currency/money can be tangible or intangible (e.g.: digital); 3. Money emitter and monetary regulator can be two different bodies; 4. Money emitter is a risk-free organization; 5. Money emitter should not enter into financial relations with financial institutions aimed at obtaining income; 6. Using foreign currency/money as the state currency is permissible; 7. Money does not necessarily have to be backed by real assets; 8. Money must be emitted in a sufficient volume to serve the needs of the economy; 9. No prohibitions and no restrictions on monetary transactions, as well as the exchange and transfer of money	The authors believe in the permissibility of using the cryptocurrencies subject to strict reservations

Table 1
Summary of Papers Included

Source	Argument	Findings
Adam, M. F. (2017)	• Bitcoin seems to be *māl* (wealth) with *taqawwum* (legal value); however, it does not possess *thamaniyyah* (currency attributes); • The following risks were determined in relation to Bitcoin: security risk, technological risk, money laundering risk, volatility risk, data risk, transaction risk, intermediary risk, regulatory challenge, structural deflation risk, competition, Bitcoin scalability risk, monopoly risk, liquidity risk; • Bitcoin falls short of fulfilling the principles of the preservation of wealth in Shariah; • Bitcoin and cryptocurrency investments do not serve the real economy and do not promote the real growth of an economy	• Bitcoin is considered to be money. • At this current time, Bitcoin is just another investment which is for individual profit maximization; nevertheless, returns on it should be lawful

1 First view: Cryptocurrency is Incompatible with Islamic Law

be compatible with Shariah law, it has to be a measure of value and it has to be a monetary commodity. He argues that there must be a standard of weight on a paper note or electronic currencies for it to be Shariah-compliant. Moreover, it has to be redeemable with a standard weight, such as gold. Otherwise, it is just another type of fiat money. Furthermore, Bakar et al., (2017) added the fact that the account holder is unknown, which makes it difficult to track in the case of any suspicious activities, which encompasses an element of *gharar* (uncertainty). Additionally, it is also vulnerable to hacking activity.

Cryptocurrency is compatible with Islamic law

All remaining papers ground their research on the permissibility of Bitcoin in Islam. According to Abubakar et al., (2018), the proponents' view on the permissibility of Bitcoin is based on the consent of any given society to use a certain commodity as a method of payment and thus it should be considered money. As a consequence, the authors believe that most of the arguments of the opponents among Muslim scholars are based on temporary problems which can be easily overcome with proper regulation of cryptocurrencies, particularly Bitcoin, by governments (Abubakar et al., 2018). Furthermore, Oziev and Yandiev (2017) stated that there is no proof that Bitcoins clearly contradict Islamic law. In addition, the rapid growth of the Bitcoin price does not necessarily signalize its impermissibility from an Islamic point of view. Instead, it is just an indication of the rising demand for Bitcoins. However, the following must be abided by for Bitcoin to be Shariah-compliant (Oziev & Yandiev 2017).

1. Bitcoin acquisition should be done with the intention of instant payments for goods and services or even for currency exchange;
2. For Bitcoin mining to be lawful, nobility as a driving force is essential.

Evans (2015) pointed out that the underlying technology of Bitcoin can effortlessly conform to the prohibition of *riba* (usury) and incorporate the principles of *maṣlaha* (social benefits of positive externalities) and mutual risk-sharing (as opposed to risk-shifting).

Muedini (2018) argues that Bitcoin and other cryptocurrencies are highly compatible within Islamic finance and, have in many cases, solved the issue of a middleman in the form of a government institution controlling currencies. Bitcoin and other cryptocurrencies have, above all, provided a better solution for several concerns of early Muslim scholars. In contrast to fiat, the issuance of Bitcoin and many other digital currencies are fixed, which, in effect, eliminates the possibility of *gharar* (deception), and also inflation. Moreover, Bitcoin cannot be altered, forged, or manipulated. Adam stated that Bitcoin does seem to be *Māl* (wealth) with *Taqawwum* (legal value); however, it does not possess *Thamaniyyah* (currency attributes). Furthermore, Bitcoin falls short of fulfilling the principles of the preservation of wealth in Shariah. Bitcoin and cryptocurrency investments fall short in serving the real economy and in promoting real growth in an economy. Therefore, it can be argued that Bitcoin is not ideal as a long-term investment and neither should the Islamic finance industry consider its use in exchange until a framework which is regulated and transparent is established (Adam, 2017).

The author concedes that currently, Bitcoin is just another type of investment which is for individual profit maximization. Despite this, returns on such investments would be Shariah-compliant (Adam, 2017). According to Asif, "although the technology of cryptocurrencies in itself is *Halal*, different aspects contribute in deciding whether the specific digital currency in question is *Halal* or *Haram*" (Asif, 2018).

Conclusion

The present paper aims to present a systematic literature review that investigates the compatibility of cryptocurrencies with the Islamic code of conduct. The stands of Muslim scholars on the permissibility of cryptocurrencies comprise both opponent and proponent. Generally, the opponents of this view argue that a cryptocurrency is not compatible with Shariah law due to the fact it has no intrinsic value, no central authority and Bitcoin value is highly unstable. Moreover, all the arguments contending that cryptocurrencies are not Islamic are weakly reasoned, whereby any inherent weaknesses or problems can be solved. As a matter of fact, many scholars are working on the shortcoming of blockchain, which are temporary in nature and can be easily solved through proper regulation. On the other hand, the advocates of cryptocurrencies' permissibility affirm that there is no proof suggesting that cryptocurrencies are against Islamic law. Moreover, all papers focus on validating or refuting whether cryptocurrencies have the characteristics of money or not, leaving out other aspects of money, such as lending, fundraising, financing and alike, which have been ignored in the academic research arena.

This systematic literature review inevitably has some limitations. Despite this, the research presented could be a springboard for further study. The focus here was on Bitcoin due to the fact that it was the first decentralized payment method. Currently, there are many types of cryptocurrency which have not been considered in this paper, so adding them to the consideration could give a more accurate result. Additionally, the literature review was limited to peer-reviewed articles. Therefore, adding more sources of information could be more prolific.

This systematic literature review suggests that policy makers in the Muslim world should consider adopting cryptocurrencies and develop a subsequent financial system compatible with the operations of cryptocurrencies. Conducting research in the technical aspect of cryptocurrencies could also prove to be beneficial to business scholars ■