

IS BITCOIN HALAL OR HARAM IN THE ISLAMIC BANKING AND FINANCE? AN OVERVIEW

Mohammad Rashed Hasan Polas¹

*Center for Post Graduate Studies, Limkokwing University of Creative Technology,
Malaysia.*

Md Muhibbullah

*Department of Economics, Faculty of Economics and Management Sciences,
International Islamic University, Malaysia.*

Amitab Bhattacharjee

Sagamihara, Tokyo, Japan.

Received 29 June 2020; Revised 30 June 2020; Accepted 2 July 2020

ABSTRACT

The paper features on the idea of virtual currencies, so as to clarify the sort of this currency, highlights of virtual currency particularly Bitcoin, and its importance to Islamic law (Shari'ah) to work in Islamic finance and banking transactions and avoiding usury (riba). The paper also highlights that the significance of the subject appeared by attempting to comprehend the position of Islamic shari'ah from the virtual currency, this will make Islamic countries to adopt this currency since it shows significance from being a highly confidential currency. Money is far away of usury in some degree, likewise the state doesn't reach the money in light of the fact that there is no particular one responsible for it, and consequently it is free of tax and free of interest. In fact, the source of some suspicious transactions on the Bitcoin network is still possible. This paper answered the question of whether the Bitcoin is permitted (Halal) or forbidden (Haram) in Islamic Finance and Banking? What is the acceptance and spread of dealing with Bitcoin around the world? The study was descriptive analysis.

Keywords: Bitcoin, Islamic Banking and Finance, Halal, Haram, Block Chain Management Systems.

CONTRIBUTION/ORIGINALITY

The study contributes to the existing literature by employing whether the Bitcoin is permitted (Halal) or forbidden (Haram) in Islamic Finance and Banking? The discussion will encourage policy makers and different stakeholders to rethink regarding the use of bit coin compared to hard money.

¹Correspondence to: Mohammad Rashed Hasan Polas, PhD Candidate, Center for Post Graduate Studies, Limkokwing University of Creative Technology Cyber Jaya, Malaysia, 63000, Tel: +8801762543474; E-mail: rashedhasanpalash@gmail.com

INTRODUCTION

With the ascent of Bitcoin compromising the traditional fiat currencies, the world saw governments reacting to it in various manners. Some like Dubai legalized it and proceeded to utilize its underlying technology, ‘the Blockchain’ to establish plans for a smart city though some even familiarized their own cryptocurrencies like Venezuela. In any case, for Muslims, another problem of the “Halal or Haram” perspective is available which must be managed for progress in the Muslim world. In existing cases, a few researchers have considered Bitcoin as Haram on the accounts of vagueness and excessive risk included, others have expressed it as Halal proclaiming it be even cleaner than the debt-based fiat currencies we use today (Li et al., 2019; Böhme et al., 2015). Nevertheless, moving beyond Bitcoin, not much literature is available to guide Muslim investors in terms of the other cryptocurrencies and tokens that exist like Ethereum, Litecoin, and Golem.

Bitcoin or Virtual currencies are not physical money in sorts, for example, gold, cash or monetary fiat which it gave by the national bank, additionally are not controlled by banks, where the virtual currencies depend on the focal break and the annulment of the role of banks as mediator between the seller and the purchaser (Bakar & Rosbi, 2018; Dyhrberg, 2016; Acquisti et al., 2016). A virtual currency is a digital representation of value that can be digitally exchanged and works as a mechanism of trade, a unit of account as well as a store of value, however doesn’t have legal tender status in any jurisdiction. It isn’t issued or ensured by any legislature and satisfies these capacities just by understanding inside the network of users of the currency. It is particular from fiat currency or “real currency”, which is the physical money that makes up a country’s legal tender, and particular from e-money, which is a digital representation of fiat currency. Virtual currencies are managed by their users as per the guideline of distributed (Campbell-Verduyn, 2018; Urquhart, 2016). Virtual currencies are portrayed by security, usability, what's more, the people who produce and exchange them are a help to humanity what's more, the individuals of the land since they are creating their own currency (Kaur, 2019; Yermack, 2017; Mettler, 2016). The most famous monetary currencies are Bitcoin, which comprises of a digital address related with an electronic wallet. The wallet is an electronic application when an individual needs to convert a specific value from a Bit of coin to someone else; he utilizes the alleged digital signature. This signature contains three things, the first is conversion letter when the Bitcoin is converted to another envelope, and the conversions go to the Bitcoin network and enter the affirmation procedure and are saved in the Chain blocks which are called Blockchain (Cong & He, 2019; Gandal et al., 2018).

METHODS

To examine beyond the extent of the current literature that exists on Bitcoin and concentrate on different parts of the cryptocurrency ecosystem, a literature research approach is being utilized. Various wellsprings of information are utilized comprising of journal publications, books and articles. So as to progress in the direction of keeping up the credibility of the information sought, sound sources are focused on. The credibility of these sources can be adjudicated by the way that they were produced by reputable researchers and experts in existing fields. Since the existing literature on Islamic banking and finance is immense, however, limited about cryptocurrencies, this paper means to gather together the information that

exists, distinguish the gaps that exist and prepare towards future study on the Shariah consistence of different cryptocurrencies and tokens beyond Bitcoin. Besides, notwithstanding examining Islamic financial principles, the very technology that administers cryptocurrencies is likewise deconstructed to give a contention that can be applied in various cases. Real world examples are likewise given to make it simpler to Muslims to comprehend the specific context of these regulations as opposed to being bound theoretically.

BITCOIN IN ISLAMIC BANKING AND FINANCE

The technological and inventive improvements in the financial and banking fields are hastening quickly, particularly in the field of digital and virtual currencies which accomplishes critical benefits. These technologies once in a while are prompts the trouble of accepting these improvements particularly in Islamic social societies, since some of them don't fit in with Islamic law. Which is requires the formation of a fatwa and the authenticity of Shari'ah researchers and law to be taken care of and exchanged. This paper feature on the idea of Virtual Currency like Bitcoin and how can it work with the necessity of Islamic banking and finance additionally with Islamic law (Shari'ah) as indicated by the assessment of Islamic researchers like (Adam, 2017; Alzubaidi & Abdullah, 2017; Gandal et al., 2018). While it expects to discover answers whether the virtual money, particularly Bitcoin is it allowed (Halal) or on the other hand it's illegal (Haram) under Islamic Law (Shari'ah). It reasons that Bitcoin may be progressively appropriate to manage it in the Islamic world, particularly Islamic banking than Usury Banks (Riba banks) as Trade Banks in view of Bitcoin is liberated from interest rate (Asad, 2018; Adhami et al., 2018).

Furthermore, with the rise of Bitcoin and supported a few people manage it so as to get rich immediately was to be halted with managing this cash to currency at a result and the decision on the authenticity of managing it (Asif, 2018; Polasik et al., 2015). Humanity managed gold and silver exchange, Dinar and Dirham, paper currency and afterward in a digital currency that exist in banks these days. At present, the virtual currency has emerged, which incorporate the Bitcoin. It is known in financial aspects that there must be three conditions to be known as a currency; the principal condition is to be a mediator acceptable for exchange with the goal that the seller acknowledges it for their products. The subsequent condition is to be a measure by which the value of the commodity can be resolved. The third condition is to be a reservoir of wealth (Ahmed, 2018; Corbet, 2018; Fry & Cheah, 2016).

Moreover, bitcoin and comparative digital forms of money fulfil the money related employments of money - going about as mode of exchange, unit of record, and store of noteworthy worth - and moreover gain status as Islamic cash by being "standard cash". Shariah notices standard cash as being whatever increases money related status through wide affirmation in the open eye or by government order (Meera, 2018; Corbet et al., 2019). In Germany, digital currency is supposed as legitimate cash and as such qualifies as bitcoin Islam cash in Germany. In countries, for instance, the US, Bitcoin needs official legitimate financial status yet is recognized for portion at a variety of traders, and thusly qualifies as bitcoin Islam standard cash. A portion of the purposes behind the rise of price are speculations in this currency (Pike, 2018; Luther, 2016). A few nations have begun to adopt it in the official circulation, expanding new services areas by embracing them as airlines, notwithstanding electronic shops what's more, money changers that exchanger currency, for example, dollars to Bitcoin and can buy some of them from websites. The most governments on the planet have not yet adopted the Bitcoin currencies

forms as a currency of exchange, yet not very many countries, for example, Germany and Japan have routinely permitted Bitcoin to be exchanged and affirmed as a method of payment. These countries have interests in permitting the currency to exchange and speculate, in the guideline of exchanging and control the movement of this currency (Muedini, 2018; Haddad & Hornuf, 2019; Pieters & Vivanco, 2017).

Besides, Bitcoin has become in restaurant, inns, and e-shops around the world. This currency has risks and drawbacks, including the accompanying: The price of Bitcoin is dependent upon fluctuation because of reasons, for example, attacks, serious viruses and the closer of large stores that sell in Bitcoin (Hrnjic & Tomczak, 2020; Peters et al., 2015; Beck et al., 2018). Likewise, in light of the fact that Bitcoin is customizing with mathematical algorithms, which influences the programming with the impacts we referenced, which can't be dealt with by people who complain to any party in light of the fact that there is no particular substance liable for objections and claims in this currency. This currency is managed by a network of users and programmers around the world who have made a network for them and are working in this currency. Despite the fact that the Bitcoin is an open network that any programmers can propose or create or change on the program that the traders work for and the products they have, and this should be effort and professional (Rehman, 2020; Gandal & Halaburda, 2016).

Most importantly, the Islamic Canonical Law, unmistakably known as Shariah relies upon the exercises of the Quran and denies certain activities, for instance, affirmation of specific premium which is perceived as usury (Riba) or interests in associations which are contrary to Islamic affirmation for example alcohol. Late enthusiasm for Islamic dealing with a record has rose with even the International Monetary Fund's official board holding the first since everlastingly exchange on Islamic Banking. Regardless of the way that premium, adventure, and theory in Bitcoin and digital money have continued taking off upward, there remains creating disorder among Muslims - which make up right around a fourth of the total populace - concerning whether Bitcoin and cryptographic types of money fit in with Shariah law (DePietro, 2018; Gandal & Halaburda, 2016; Makarov & Schoar, 2020). Shariah law is an arrangement of principles sought after by Muslims according to the standards of the Quran and exercises of the Prophet Muhammad, harmony peace arrives. The Islamic reserve portion, which offers money related things to Muslim individuals and Islamic foundations, sticks to Shariah law - clear comprehension of digital money and blockchain continue creating in criticalness as specialists dynamically perceive that blockchain will change each zone of the overall budgetary structure correspondingly the web changed media and dispersing (Singhal & Rafiuddin, 2014; Walch, 2015; Ølnes, 2016).

Furthermore, it is fundamental to comprehend the essential contrast between a cryptocurrency and a token so as to know what one is investing in. Cryptocurrencies are coins that are explicitly made to be utilized as digital currencies, as a medium of exchange (Schilling & Uhlig, 2019; Hockett & Omarova, 2016). Actually, tokens serve as a gathering fundraising tool utilized by start-ups identified with the crypto sphere instead of conventional finance raising methods, for example, venture capital. Tokens are discharged to the public through an Initial Coin Offering (ICO) similarly as shares are given by a public limited company (plc) through an Initial Public Offering (IPO). The latter is carefully controlled while ICOs have been abused to pull off scams previously. In spite of the fact that this is changing with nations, for example, America placing regulations on how these are directed,

the fraud can without much of a stretch be maintained a strategic distance from by due steadiness, consequently it doesn't conflict with Islam's standards. The value of a token relies upon how the organization who issued it in any case is holding request and performing. This can be viewed as possessing a share in an organization, however, with less right, for example, no value, no state in the start-up's choices and no state toward the path the start-up takes. This additionally complies with the Islamic principles of an investor knowing regarding what they are purchasing with no trickiness included. So, cryptocurrencies are digital currencies while a token is an asset much like a share (MacDonald et al., 2016; Dierksmeier & Seele, 2018).

Above all, cryptocurrencies and tokens in themselves are Halal and further dig into isolating the Shariah-compliant and non-Shariah compliant types. Everything being equal, it is preposterous to expect to assess each and every digital currency or token however by analyzing the protocols that oversee every currency, the intended use instances of each currency and seeing whether the digital currency or token being referred to falls into certain areas, for example, Riba, this paper dives into the angles that would make a cryptocurrency or token haram alongside its subsidiaries, for example, alternatives and futures contracts.

MODEST PROPOSALS

Currency in Islamic shari'ah normally should be tangible, that implies can account it as money (Mal), it must be variable, and furthermore it must be lawful. Researchers of shari'ah have three suppositions: the first opinion, Bitcoin isn't (Mal) and the speculation has not complained of Islamic shari'ah on the grounds that it is simply speculative. Second opinion, Bitcoin isn't real money yet it is digital assets. The third opinion says the Bitcoin is currency. Bitcoin in Islamic shari'ah so as to be (mal) it must have two things (i) desirability and (ii) storability (Adam, 2017).

All together for the money to function, the accompanying conditions must be met so as to be open acknowledgment, as opposed to the unique, to meet the debts and financial obligations. The most significant of these conditions are as following: (Ali & Al-Issa, 2004).

- That the money received general acceptance
- Homogeneity of the unit of money and its symmetry
- Relative stability in value
- Indivisibility
- Easy to carry and lightweight
- Their inability to damage quickly

Bitcoin as other currency has a few highlights or characters, it isn't tangible, it doesn't have an incentive rather than evaluate, dependably doesn't related to anybody to issue it, it cannot save.

So as to fund any project, you should know the prerequisite of Islamic finance. There are a few prerequisites that every individual who manages Islamic bank or Islamic finance institution should place into thought this necessity as the following: (Bergestr, 2015).

- 1) Prohibition of interest rate. Interest must be prohibited on obligation and ought not to be approached to pay, to receive or promise to pay.
- 2) Giving a wrong idea or impression (misdirecting). "Specialists should not misdirect their exchange accomplices. Exchange accomplices are qualified

for comprehend what they purchase. Further exchange accomplices must have the option to take their own decisions in opportunity".

- 3) Real substance. Offering products and services should be through real or true entity, not a virtual entity.
- 4) Islamic law (Shari'ah) are forbidden and prohibition Gambling.
- 5) Compulsory to give an aggregate of money to a charity or needy people as a donation.

There are some principles that consider Bitcoin (halal) while others consider it (haram). In any case, so far it has been demonstrated that there are a few perspectives and highlights of Bitcoin that are thought of (halal). According to all the information over the study presume that:

- 1) Trading in Bitcoin is free of interest rate (without riba) which considered as Islamic finance (halal), yet it's not physical material as Money (mal) can contact, thusly it's not acceptable.
- 2) Islamic shari'ah doesn't acknowledge Bitcoin as a currency utilized in transactions, financial transfer, trade or business in light of the fact that Bitcoin is fake currency not real therefore it is (haram).
- 3) Most of the countries with the exception of Germany and Japan every one of them decline utilizing Bitcoin as a currency since it's not dependable from any formal organization on the planet, possibly in the future under central banks responsibility and will be allowed (halal) to use in Islamic banks.
- 4) It is open the entryway for money laundering or terrorist to transfer, exchange money without knowing whom the owner of it.
- 5) Its control of the (ghurar) the longing of the trader to make a quick profit, which gives the impression or addition the status of betting, and that impression is forbidden (haram) in Islamic shari'ah.
- 6) Also, it's Not allowed (halal) in view of no security or Guarantee, its unknown currency, and it has high vitality and risks.
- 7) It doesn't have possessed the elements of money (mal).

CONCLUSION

This paper analyzes the connection between conveyed, autonomous block chain management systems (BMS) like Bitcoin-additionally alluded to as a 'virtual currency'-and Islamic Banking and Finance (IBF). It shows that a BMS can adjust with the prohibition of riba (*usury*)-as Bitcoin does-and incorporate the standards of *maslahah* (social advantages of positive externalities) and mutual risk-sharing (instead of risk-shifting). Bitcoin Halal or bitcoin haram is an idea that won't be settled easily. There are a few guidelines that consider bitcoin halal while others consider it haram. Islamic law gives a lot of specific conditions which must meet all requirements for an advantage for be Halal. In spite of the fact that cryptocurrencies are in the literal sense to be utilized as a mode of exchange, they likewise qualify as resources alongside Tokens since they help as a store of significant worth as the conventional fiat currencies may while the latter looks like a portion of an organization. Nevertheless, so far it has been demonstrated that there are a few

viewpoints and highlights of bitcoin that are viewed as halal yet in the event that you are intending to utilize it for betting or other such tasks you should realize it will be considered haram. The paper recommended being cautious and avoid using Bitcoin in selling, buying and exchanging Bitcoin currency until discovering some legal and formal rules.

Considering the above discussion, it may be inferred that the cryptocurrency ecosystem comprises of both Halal and Haram components. In investigating any digital currency or token, one must gander at various viewpoints both from a technological and a religious point of view. Technologically, the consensus protocols must be deconstructed intelligently to evaluate whether they are in accordance with Islamic conjunctions. As of now, the authors consider the Proof of Work (PoW) protocol as Halal while the Proof of Stake (PoS) protocol as Haram. Religiously, the prohibitions of Riba, Gharar and Maysir must be checked against in each exchange or investment. With the expansion in financial instruments, for example, futures contracts and options, it is vital that one ought to evaluate their consistence with a Shariah point of view too with regards to cryptocurrencies although existing ones were seen as Haram. Despite the fact that they don't influence a digital asset straightforwardly, the earnings resulting from an impermissible source themselves are regarded Haram which is the reason due constancy is required in this field.

SUGGESTIONS FOR FUTURE RESEARCH

Despite the fact that the technical aspects of the cryptocurrency ecosystem were deconstructed alongside evaluating the permissibility rules as indicated by Islamic lessons, further research is required to handle increasingly complex issues which are of significance in making cryptocurrency adaption conceivable in the Islamic world. A few explicit questions are:

1. A currency utilizing the PoS system is Haram because of the dividend it offers its holders in the form of interest yet does likewise approach apply if a currency just uses a little piece of this approach as on account of the Ethereum Casper protocol?
2. Is it Halal to exchange cryptocurrencies or tokens utilizing the Proof of Stake convention if one doesn't participate in activities, for example, validation which brings about the amassing of interest money? In banking, Islamic researchers have recommended various approaches to handle the interest money given by a bank utilizing ways, for example, opening a checking account and doing convenient instalments, discarding the interest for the type of good cause or, dismissing it altogether from the bank. In any case, what approach will apply in this previously mentioned case of cryptocurrencies and tokens?

Delivering answers for these key questions and further complex issues that can emerge will enable Muslim investors to continue with a progressively comfortable approach towards cryptocurrencies and in such positively affect the Islamic financial system.

COMPETING INTERESTS

The authors declared no potential conflicts of interest for the research, authorship and/or publication of this article.

ACKNOWLEDGEMENT

All authors contributed equally to the conception and design of the study. We sincerely thank and acknowledge the valuable time and cooperation given by Professor Dr. Asghar Afshar Jahanshahi, CENTRUM Católica Graduate Business School, Pontificia Universidad Católica del Perú.

REFERENCES

- Adam, M.F. (2017). Bitcoin: Shariah compliant. Amanah Finance Consultancy 2017: 1-54.
- Adhami, S., Giudici, G. & Martinazzi, S. (2018). Why do businesses go crypto? An empirical analysis of initial coin offerings. *Journal of Economics and Business*, 100: 64-75.
- Alzubaidi, I.B. & Abdullah, A. (2017). Developing a digital currency from an Islamic perspective: Case of blockchain technology. *International Business Research*, 10(11): 79-87.
- Ahmed, M. (2018). Exploring acceptability and legitimacy of bitcoin in Islamic financial system. *Journal of Islamic Civilization and Culture*, 1(1).
- Asad, S.I. (2018). 'Validity of cryptocurrencies in Islamic finance?', *DAWN*, November 12. Accessed on April 18, 2020. Available online at: <https://www.dawn.com/news/1445072>
- Asif, S. (2018). The halal and haram aspect of cryptocurrencies in Islam. In *The Name of Allah, The most Beneficent, The most Merciful*, p: 91.
- Bakar, N.A. & Rosbi, S. (2018). Robust framework diagnostics of blockchain for bitcoin transaction system: A technical analysis from Islamic Financial Technology (i-FinTech) perspective. *International Journal of Business and Management*, 2(3): 22-29.
- Beck, R., Müller-Bloch, C. & King, J.L. (2018). Governance in the blockchain economy: A framework and research agenda. *Journal of the Association for Information Systems*, 19(10): 1.
- Böhme, R., Christin, N., Edelman, B. & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *Journal of Economic Perspectives* 29(2): 213-238.
- Campbell-Verduyn., M. (2018). Bitcoin, crypto-coins and global anti-money laundering governance. *Crime, Law and Social Change*, 69(2): 283-305.
- Cong, L.W. & He, Z. (2019). Blockchain disruption and smart contracts. *The Review of Financial Studies*, 32(5): 1754-1797.
- Corbet, S., Lucey, B. & Yarovaya, L. (2018). Dated stamping the Bitcoin and Ethereum bubbles. *Finance Research Letters*, 26: 81-88.
- Corbet, S., Lucey, B., Urquhart, A. & Yarovaya, L. (2019). Cryptocurrencies as a financial asset: A systematic analysis. *International Review of Financial Analysis*, 62: 182-199.
- DePietro., A. (2018). 'Blockchain And Islamic Banking Are Working Together, And Everyone Stands to Benefit', *Forbes*. Accessed on: May 22, 2020. Available online at: <https://www.forbes.com/sites/andrewdepietro/2018/07/11/blockchain-islamic-banking-benefits/#3c935923af2b>
- Dierksmeier, C. & Seele, P. (2018). Cryptocurrencies and business ethics. *Journal of Business Ethics*, 152(1): 1-14.
- Dyrhberg, A.H. (2016). Bitcoin, gold and the dollar-A GARCH volatility analysis. *Finance Research Letters*, 16: 85-92.
- Fry, J. & Cheah, E.T. (2016). Negative bubbles and shocks in cryptocurrency markets. *International Review of Financial Analysis* 47: 343-352.
- Gandal, N., Hamrick, J.T., Moore, T. & Oberman, T. (2018). Price manipulation in the Bitcoin ecosystem. *Journal of Monetary Economics*, 95: 86-96.
- Gandal, N. & Halaburda, H. (2016). Can we predict the winner in a market with network effects? Competition in cryptocurrency market. *Games* 7(3): 16.

- Haddad, C. & Hornuf, L. (2019). The emergence of the global fintech market: Economic and technological determinants. *Small Business Economics*, 53(1): 81-105.
- Hockett, R.C. & Omarova, S.T. (2016). The finance franchises. *Cornell L. Rev.* 102: 1143.
- Hrnjic, E. & Tomczak, N. (2020). 'Prospects of cryptocurrencies in Islamic finance'. The Jakarta Post. Accessed on: May 18, 2020. Available online at: <https://www.thejakartapost.com/academia/2020/02/24/prospects-of-cryptocurrencies-in-islamic-finance.html>
- Kaur, D. (2019). 'Could there be a halal cryptocurrency?'. The Malaysian Reserved. Accessed on: May 18, 2020. Available online at: <https://themalaysianreserve.com/2019/12/23/could-there-be-a-halal-cryptocurrency/>
- Li, Z.Z., Tao, R., Su, C.W. & Lobonç, O.R. (2019). Does bitcoin bubble burst? *Quality & Quantity*, 53(1): 91-105.
- Luther, W.J. (2016). Cryptocurrencies, network effects and switching costs. *Contemporary Economic Policy*, 34(3): 553-571.
- Makarov, I. and Schoar, A. (2020). Trading and arbitrage in cryptocurrency markets. *Journal of Financial Economics*, 135(2): 293-319.
- MacDonald, T.J., Allen, D.W. & Potts, J. (2016). Blockchains and the boundaries of self-organized economies: Predictions for the future of banking. *Banking beyond banks and money*, pp: 279-296.
- Mettler, M. (2016). Blockchain technology in healthcare: The revolution starts here. 2016 IEEE 18th International Conference on E-Health Networking, Applications and Services (Healthcom), pp: 1-3.
- Meera, A.K.M. (2018). Cryptocurrencies from islamic perspectives: The case of bitcoin. *Buletin Ekonomi Moneter Dan Perbankan*, 20(4): 475-492.
- Muedini, F. (2018). The compatibility of cryptocurrencies and Islamic finance. *European Journal of Islamic Finance*, (10).
- Ølnes, S. (2016). Beyond bitcoin enabling smart government using blockchain technology. *International Conference on Electronic Government*, pp: 253-264.
- Peters, G., Panayi, E. & Chapelle, A. (2015). Trends in cryptocurrencies and blockchain technologies: A monetary theory and regulation perspective. *Journal of Financial Perspectives* 3(3).
- Pieters, G., & Vivanco, S. (2017). Financial regulations and price inconsistencies across Bitcoin markets. *Information Economics and Policy*, 39: 1-14.
- Pike, C. (2018). Islam and cryptocurrency, halal or not halal? Aljazeera. Accessed on: April 22, 2020. Available online at: <https://www.aljazeera.com/news/2018/04/islam-cryptocurrency-halal-halal-180408145004684.html>
- Polasik, M., Piotrowska, A.I., Wisniewski, T.P., Kotkowski, R. & Lightfoot, G. (2015). Price fluctuations and the use of bitcoin: An empirical inquiry. *International Journal of Electronic Commerce*, 20(1): 9-49.
- Rehman, M.U., Asghar, N. & Kang, S.H. (2020). Do Islamic indices provide diversification to bitcoin? A time-varying copulas and value at risk application. *Pacific-Basin Finance Journal*, 101326.
- Schilling, L. & Uhlig, H. (2019). Some simple bitcoin economics. *Journal of Monetary Economics*, 106: 16-26.
- Singhal, A. & Rafiuddin, A. (2014). Role of bitcoin on economy. *Proceedings of the World Congress on Engineering and Computer Science* 2.
- Urquhart, A. (2016). The inefficiency of Bitcoin. *Economics Letters*, 148: 80-82.
- Walch, A. (2015). The bitcoin blockchain as financial market infrastructure: A consideration of operational risk. *NYUJ Legis & Pub Pol'y* 18: 837.
- Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance*, 21(1): 7-31.