

BITCOIN & BEYOND: THE FUTURE OF CRYPTOCURRENCIES, SECURITY, AND INVESTMENT

Mr. Vansh Bathla*
Prof. Karam Pal Narwal**

ABSTRACT

Bitcoin and other popular cryptocurrencies have gained a lot of attention in recent years. Within the confines of the blockchain, users can acquire and exchange this coin. The first cryptocurrency, Bitcoin, was created to enable direct online payments without relying on centralised financial institutions. The implementation of blockchain technology in the utilisation of cryptocurrency has garnered attention from various entities such as the banking industry, stakeholders, government, and individual investors. Studies on cryptocurrencies are still in their infancy and are limited. This article will analyse the potential in the cryptocurrency such as the security of its technology, cheap transaction costs, and high investment return in order to provide meaningful guidance and viewpoint to the academic field and users. This paper's novelty lies in its examination of legislation and regulation, high energy usage, the possibility of bubbles and crashes, and network attacks. This study will provide a systematic review for the future endeavours of cryptocurrency and its application. The current review is beneficial to academics and managers, as well as those seeking a more balanced knowledge of these emergent financial products.

KEYWORDS: *Cryptocurrency, Blockchain Technology, Investment Potential, Regulatory Challenges, Security Risks.*

Introduction

Since paper money was first made, people have used it to buy and sell things every day. It is now much easier to trade and do business (Fauzi et al., 2020). In 2009, after the stock market crash, Bitcoin, the first cryptocurrency, has been around (Nakamoto, 2008). It was first made public in 2008 by Nakamoto, an anonymous group or person (Nakamoto, 2008). Bitcoin is the first digital currency that makes it easy for people to do day-to-day transactions with each other (Fauzi et al., 2020).

Bitcoin is run without a third party like banks or other financial institutions. It is a type of peer-to-peer transaction that doesn't require anyone to share their identity (Fauzi et al., 2020). In contrast to present practice, the bank serves as a middleman or go-between, is aware of the identities of both the buyer and the seller, resulting in concerns over the privacy of personal data (Nakamoto, 2008). The Bitcoin platform has greatly facilitated and increased the independence of bitcoin trading and transaction while protecting user privacy. Some claim that choosing this type of payment entitles them to free and anonymous transactions (Fauzi et al., 2020).

* Research Scholar, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India.

** Professor, Haryana School of Business, Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India.

Bitcoin is the world's first digital currency to utilize the blockchain platform. It is created within a transaction log with networked computers participating (Fauzi et al., 2020). This blockchain is among the most secure because it prohibits fraudsters from using the currency more than once (Nakamoto, 2008). Proof of work is utilised by the blockchain protocol to guarantee that miners converge on this structure (Fauzi et al., 2020). The computational operation is referred to as hashing, and hashing power refers to the computational power required to mine cryptocurrencies (Nakamoto, 2008).

Even for participants in the sector and academics conducting study in this area, the bitcoin market's system is rather complicated and challenging to understand (Fauzi et al., 2020). Numerous studies have highlighted Bitcoin's advantages, including its security, low transaction costs, high return, and use as a substitute instrument for a nation's bailout mechanism and for paying employees' wages (Fauzi et al., 2020). Nevertheless, some researchers have pointed out the risks and disadvantages of using this digital coin, including the absence of regulation, high electricity bills as a result of energy consumption, a lack of security as well as other problems like anonymity and switching costs (Fauzi et al., 2020).

Mining and the Blockchain System

Fiat money is made by the central bank, while cryptocurrency is made by using cryptography to mine on the blockchain (Narayanan et al., 2016). The blockchain system is made up of users, developers, miners, node maintainers, and the exchanges between them that make sure the distributed ledgers work (Antonopoulos, 2017).

In order to use this method of mining, miners have to spend money on software and tools (Frankenfield, 2022). GUIMiner, BFGminer, and CGminer are all examples of tools used for Bitcoin mining (Griffin, 2021). AntMiner, Avalon, and ASICMiner are the names of the hardware (Antonopoulos, 2017). For mining other coins that use a lot of different algorithms, you need high-end, fast graphics cards (Narayanan et al., 2016).

A new miner needs to sign up for an online wallet and an encrypted bank account that can store and accept bitcoin (Frankenfield, 2022). When a worker is able to figure out the puzzle in the blockchain system, the digital coins will be sent to the wallet that was chosen ahead of time (Antonopoulos, 2017).

Opportunities and Advantages

As was already said, using blockchain technology to use cryptocurrencies can reduce the cost of trust, which is an important part of the financial system that shows up in different ways (Berg et al., 2019). Some of these costs are commissions paid by intermediaries, fees for making and keeping contracts, settlement processes, security, and user identification (Berg et al., 2019). People must trust banks to keep their cash safe (Nica et al., 2017).

There are many problems and recent crises in the financial industry. For example, because of the global financial crisis of 2008, millions of people around the world lost their jobs and homes (Zhang, 2017). Even though cryptocurrencies aren't the answer to everything, even if you don't have financial problems, it's still important to look into how these economic and financial tools can affect financial security and make the financial sector stronger (Kaponda, 2019).

Many people say that centralised financial institutions combine risks, pass on losses to society, and make a lot of money from economic rents (Zhang, 2017). Cryptocurrencies can solve some problems that are built into the current financial systems, like a lack of trust, inefficient transactions, and uncertainty (Berg et al., 2019).

The inefficiency, excessive cost, and liquidity blockage that characterise the conventional method to cross-border payments (Pournader et al., 2020). Payment procedures are opaque and come with a number of hazards for fraud and varying prices. Consequently, payments in cryptocurrencies can solve numerous of these problems (Nica et al., 2017). Cryptocurrencies can be used to stop fraudulent exchanges or payments, making service transactions simple and effective (Y. Wang et al., 2019).

Online payment methods are where bitcoins are used the most frequently. The growth of cashless transactions and the use of credit cards have helped cryptocurrencies become the most widely used method of payment on the Internet (Larios-Hernández, 2017). Because exchange partners might trade, exchange value, and settle their payments using cryptocurrencies, digital currencies have the potential to impact cash flows and supply chain architecture (Y. Wang et al., 2019).

Pournader et al. (2020) assert that businesses can perform rapid money transfers and lower commission costs by streamlining payments through cryptocurrencies. For instance, Ripple is an open-source, decentralised peer-to-peer digital payment technology that permits near-instantaneous cash transactions in any form (Pournader et al., 2020). To link existing bank ledgers and enable nearly real-time cross-border payments, Ripple uses the blockchain. More than 1,500 transactions may be handled each second by Ripple (Larios-Hernández, 2017).

Users of Ripple have access to a set of signing/verification keys that enable them to transmit payments securely. A transaction fee that is stated in the blockchain is required for every Ripple transaction submitted to the network (Y. Wang et al., 2019). Despite the fact that cryptocurrencies are still not widely acknowledged worldwide, several online stores now allow their customers to pay with them in Bitcoin, Litecoin, and Peercoin (Kaponda, 2019).

Payments made with cryptocurrencies can be made between accounts or wallets without the involvement of a third party, which lowers transaction costs and improves security and privacy (Nica et al., 2017). On these grounds, Nica et al. (2017) contend that the Bitcoin system's popularity is due to the low transaction fees it provides to customers, making it a competitive option to traditional payment providers. However, Alonso-Monsalve et al. (2020) emphasise that in order to achieve this cost advantage, cryptocurrency trading should operate on the basis of certain assumptions that might not apply in particular circumstances, such as rapid connections between users, low transaction fees, and strong liquidity (Alonso-Monsalve et al., 2020).

Compared to traditional payment options, bitcoins have a substantially faster settlement time. A non-cash financial transaction may take days or even weeks to resolve, but the average settlement time for Bitcoin is about ten minutes (Larios-Hernández, 2017). In the real world, it might be risky and difficult to transfer a lot of money, but with cryptocurrency, users can transfer money quickly and surreptitiously (Kaponda, 2019).

Challenges of Cryptocurrencies

The growing popularity of cryptocurrencies and FinTech comes with some risks that raise a lot of questions and worries about how well virtual currencies will be able to fit into the monetary and financial system in the future, especially in the absence of laws and rules set by the government (Zetzsche et al., 2018). Online black markets are getting bigger and bigger at a very fast rate (Moore & Rid, 2016).

Bitcoin has already brought back black markets and opened up a lot of new possibilities because it is hard to find out who is buying or selling bitcoins (Böhme et al., 2015). Bitcoin is a great way to do business on the digital black market because it makes it harder for officials to do their jobs (Moore & Rid, 2016). Cryptocurrencies have the ability to change the way the black markets are set up and run. Most of the time, weapons, drugs, and other illegal things are sold on the dark web with the help of cryptocurrencies (Tzanetakis, 2018).

Cryptocurrency helps the illegal money system, which is used for things like drug dealing, laundering money, and child pornography (Aldridge & Décary-Héту, 2016). Because of this, the appearance of black markets in controlled economies makes people's lives, activities, and incomes less stable (Moore & Rid, 2016).

Cryptocurrencies are linked to illegal actions because they can get around government oversight of monetary policy and get around rules that are already in place (Zetzsche et al., 2018). In the same way, cryptocurrencies are thought to be the biggest uncontrolled markets in the world (Aldridge & Décary-Héту, 2016).

Some European countries, like Austria, Belgium, and Croatia, have no laws or rules about how to use cryptocurrency (Stoll et al., 2019). The fact that deals based on cryptocurrency don't have a central point of control means that makes it harder to track, which may help hide criminal actions (Böhme et al., 2015).

A payment on the Bitcoin platform consumes about 58 times more energy than a Visa credit transaction (Stoll et al., 2019). The authors contend that despite the fact that Visa depends on numerous banking and institutional systems that require vast amounts of energy to operate, this energy consumption is still dwarfed by that of cryptocurrency (de Vries, 2018).

Additionally, the mining of cryptocurrencies has been the subject of similar negative press as a result of accusations that they use a lot of energy and are bad for the environment (de Vries, 2018).

Even though many nations are working together to reduce tax evasion, cryptocurrencies can operate as a tax haven, making it difficult for governments to audit and punish tax evaders (Zetzsche et al., 2018). Another alarming development is the potential use of cryptocurrency as a form of financing terrorism. Payments made using cryptocurrency are ideally suited for funding international terrorism and transnational criminal organizations because of their ability to conceal transactions with a high degree of privacy and anonymity (Böhme et al., 2015).

Future of Cryptocurrencies

The introduction of new cryptocurrencies and the continuous development of other variants have significantly expanded the market, resulting in a substantial market decline (Makarov & Schoar, 2020). This behaviour illustrates a critical concern in the cryptocurrency markets: the uncertainty and volatility of these markets (Corbet & Lucey, 2018).

The existing framework of financial markets indicates that other developing currencies are increasingly emerging as formidable competitors to Bitcoin. These currencies are not merely rivals vying for user attention and demand; they can also be perceived as a threat to Bitcoin when evaluated in terms of pricing and market size (Baur et al., 2018). Competition is anticipated to intensify as these currencies achieve recognition and appreciation among investors and consumers (Glaser et al., 2014).

The implementation of the proof of stake method is anticipated to substantially decrease energy consumption in the mining of these digital currencies (Goodman & Law, 2022). This is anticipated to diminish the total expenses associated with cryptocurrency mining, hence enhancing its economic viability (Saleh, 2021).

To improve the effectiveness of the proof of work, it is essential to offer an additional analysis, thereby ensuring its appropriate application in various scenarios (Antonopoulos, 2017). The concept derived from an answer to a mathematical problem is likely to be utilised again, as the method of incentivizing one person involves granting a reward to another individual. This method not only showcases the primary designer's creative abilities but also fosters the implementation and enhancement of the scheme's applicability among community problem solvers (Nakamoto, 2008).

It may be beneficial to examine the potential for converting electrical energy generated during the mining process into thermal energy. This strategy may enhance the efficiency of energy management within the operation (de Vries, 2018). This objective can be achieved in cold climates by utilizing the substantial heat energy produced during computer processes necessary for resolving complex arithmetic problems. A portion of it can be effectively utilised to heat residential spaces and to do various other domestic tasks that require substantial heat (Stoll et al., 2019).

Conclusion

The presence of cryptocurrency in the financial market appears to be enduring, as evidenced by the findings of Böhme et al. (2015) and Baur et al. (2018). The emerging technologies that possess the ability to benefit humanity are poised to be a significant influence on future trading practices; (Antonopoulos, 2017); (Narayanan et al., 2016). The expected influence of these emerging technologies on trading processes, methodologies, and the overall framework and dynamics of trading systems is considerable (Alonso-Monsalve et al., 2020); (Glaser et al., 2014).

The individual participating in the cryptocurrency domain has the ability to assess whether their engagement with this digital asset will lead to favorable results or adverse consequences for themselves (Fauzi et al., 2020). This assessment is primarily influenced by their objectives and a subjective interpretation of the ownership and utilisation of cryptocurrencies (Narayanan et al., 2016). Consequently, the factors discussed will enable a player to engage in appropriate thinking and make decisions that align with their goals and beliefs regarding the incorporation of cryptocurrencies into their financial strategy (Böhme et al., 2015).

This study has provided a thorough analysis of the many incentives connected to cryptocurrency movement. The examination has significantly underscored the technological advantages and attributes of cryptocurrencies, as discussed by Antonopoulos (2017) and Narayanan et al. (2016). Additionally, as noted by Baur et al. (2015), it has highlighted the low transaction costs associated with cryptocurrencies. Key discussions have revolved around the intricate issues of laws and regulations, as well as the

potential for regulatory frameworks (Zetzsche et al., 2018; Kaponda, 2019), energy consumption concerns (de Vries, 2018; Stoll et al., 2019), and the phenomena of market crashes or bubble formations (Baur et al., 2018; Glaser et al., 2014). Each of these topics presents unique challenges that warrant thorough analysis and consideration (Nica et al., 2017).

According to the literature, the development of blockchain security—which is demonstrated by the use of proof of activity, byproducts from proof of work, and a knowledge management system—highlights the technology's dynamic nature (Saleh, 2021; Goodman and Law, 2022). It is essential to undertake a comprehensive and in-depth examination of the numerous issues associated with cryptocurrency (Pournader et al., 2020). The necessity for this is underscored by the optimistic outlook on the advancement of blockchain systems (Berg et al., 2019; Narayanan et al., 2016) and the regulatory frameworks surrounding digital currencies (Zetzsche et al., 2018). The necessity for rigorous investigation is paramount to gain a comprehensive understanding of the forthcoming developments and the potential trajectory of this rapidly evolving field (Narayanan et al., 2016).

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