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NAVIGATING THE CRYPTO JUNGLE: A ROADMAP TO UNDERSTANDING CRYPTO ASSETS AND BLOCKCHAIN

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Abstract: *The article provides a comprehensive analysis of the constantly changing and dynamic domain of blockchain technology and cryptocurrency. It explores the foundational principles that support these technologies and the significant consequences they have on the era of digitalization.*

Keywords: *Bitcoin, Blockchain, Digital asset, Borderless transactions, Cryptocurrency.*

INTRODUCTION

Virtual currencies have developed at an accelerated rate in conjunction with the Web migration of a wide variety of infrastructure and systems and the Internet's rapid evolution. Today, virtual currencies play a key role in the transformational change affecting the world economy, reflecting the expanded venues available to consumers to access goods and services (IMF, 2016). Indeed, unlike traditional currencies, virtual currencies offer a peer-to-peer exchange mechanism eliminating the need for intermediaries and central clearinghouses (IMF, 2016).

While virtual currencies are not afforded legal tender, they may still have equivalent traditional currency value (Hughes, 2015:495-504). Within this category, Bitcoin has developed and attained primary market status among virtual currencies that can be exchanged for traditional currencies (Hughes, 2015:495-504).

Bitcoin (Nakamoto, 2008) is widely recognized as the most notorious cryptocurrency and, if not the most valuable "crypto" in circulation. It is now valued at around 34.734,90 USD (https://www.google.com/finance/quote/BTC-USD) making it a high valued digital asset. As research shows, Bitcoin and cryptocurrencies in general present the characteristics of a bubble: "*it is very volatile, exhibits large kurtosis, and negative skewness*" (Camerer, 1989), but still the results are inconclusive. It is essential to emphasize that prospective buyers and consumers of such assets should exercise prudence and possess a comprehensive understanding of the associated risks. Considerable amounts of capital can be lost when dealing with such volatile assets, as demonstrated by significant examples (https://www.investopedia.com/what-went-wrong-with-ftx-6828447). From my perspective, we are dealing with the speculative value of a digital asset that is supported by its investors and marketed in a manner that seemingly offers an overnight profit utopia. While I maintain the view that the cryptocurrency mania will eventually cease to exist permanently, I cannot help but admire the technologies that gained prominence with the advent of Bitcoin—technologies that may present certain hazards but also provide numerous benefits.

1. THE BUILDING BLOCKS OF BLOCKCHAIN TECHNOLOGY

Bitcoin's main feature is the so-called "blockchain". Blockchain, a distributed ledger technology (DLT) *tries to build a decentralized, disintermediated, and distributed technology, which enables decentralized, disintermediated, and distributed modes of social coordination in a mostly decentralized, disintermediated, and distributed manner* (Quintais et al., 2019:1). It was first time popularize as being the technology behind Bitcoin (Cong et al., 2017:7). Why is it called a *ledger* (https://dictionary.cambridge.org/dictionary/english/ledger) and *distributed*? Mainly because it holds information about the users' actions and it keeps adding the information without deleting the existent ones, information that is available to every user. All the participants can see the state of transactions at any point in time and they can monitor it (https://www.ibm.com/topics/blockchain). Bitcoin was designed to be a public cryptocurrency, that anyone could access and join and in the absence of a central authority (as it was designed to be decentralized), in such a way to be safe to every user, by keeping people honest (Jeffries, 2018). As we already mentioned, the technology was popularized with the appearance of Bitcoin, but it was not something that was invented with it, as similar kind of technologies already arose in the previous century (Back, 1997). At the beginning of the chapter about blockchain we borrowed a definition that emphasizes the fact that this ledger is decentralized, so in a word independent. We continue by stressing the fact that, as we already mentioned, the use of these DLT's came to popularity with cryptocurrencies and it uses cryptography in almost all its processes, *digital ledgers use cryptographic algorithms to verify the creation and transfer of digitally represented assets over a peer-to-peer network* (Volpicelli, 2016). As cryptography is a method of protecting information through the use of codes and algorithms (Richards, 2021) the DLT's usage of cryptography is very broad and it is applied in ways such as *public key cryptography*, which is a method used to transfer a certain asset. The participant creates a digital signature with its undisclosed cryptographic credentials. Other participants of the DLT can confirm said transaction by authenticating the ledger entry with the help of a mathematical algorithm (Mills et al., 2016).

If there are potential hazards associated with bitcoin, it is reasonable to infer that blockchain technology and decentralized ledgers, which are closely related, may likewise have inherent risks. The majority of decentralized blockchains provide user anonymity, which often leads to the emergence of bad attributes. As previously stated, although its purpose is to encourage honesty among users, this does not imply that it is impervious to tampering or immune to involvement in unlawful activities. The decentralized nature of the ledger implies the absence of government or public institutional oversight to monitor fraudulent activities. Government trusted institutions like the FATF (https://www.fatf-gafi.org/en/the-fatf.html) can lose track of what could happen in transactions in blockchains, fact that led to this technology being associated with illegal and fraudulent behavior like money laundering, terrorism financing, organized crime, etc.

2. HOW BITCOIN TRANSACTIONS ARE PROCESSED USING BLOCKCHAIN TECHNOLOGY

Given Bitcoin's nature, mathematical formulas and cryptography respectively control its issuance and use (Mullan, 2014). While users' software store a public record of all transactions - the blockchain - the actual identity of the transacting parties remains anonymous, as no personal information is required to create an account on the platform or exchange Bitcoins. Elimination of a third party intermediary, such as a bank, ensures anonymity within Bitcoin transactions (Federal Reserve Board, 2014). Anonymity is furthered by the absence of reporting requirements and regulatory agencies, such as central banks and taxing authorities (Piazza, 2017: 275-276).

In the absence of a third party clearinghouse, participants are free, but not bound, to voluntarily record each transaction on the blockchain (Piazza, 2017: 275-276). However, the effectiveness of this recording method is disputable: users who record their transactions are rewarded with newly minted Bitcoins (Piazza, 2017: 275-276). On the other hand, there is no penalty associated with failing to record. This approach, which is based on incentives, helps to explain, at least in part, the continuous expansion of Bitcoin systems.

The blockchain is comprised of a series of transactions each consisting in a "block" (Tasca, 2015). Each block details the item and the consideration that was traded, the time that the transaction took place, and the identities (or at the very least, the pseudonyms) of the people that participated in the exchange. Through headers that convey information (using codes) describing the content of the transaction block that came before it and the one that comes after it, each block is "chained" to the one that came before it and the one that comes after it. Therefore, using the codes that are supplied in the header of each block, it is possible to get the transaction block that came before it, and continue doing so until one reaches the first transaction. However, despite the fact that it is feasible to track Bitcoin transactions back to the initial purchase of assets, it may be hard to trace the transaction back to specific persons. This is because the kind of exchange that was utilized makes a difference in this regard. In addition, the visibility choices chosen by the exchange may determine whether the records stored in the blockchain are accessible to the general public or are limited to authorized users and subscribers only. In the alternative, an intermediate solution has been devised in which a firm records its daily transactions on a private blockchain that is only available to authorized users, but that corporation also regularly updates and provides an aggregate version of those transactions on a blockchain that is open to the public. This solution is a hybrid of the two previous options. Because of the way it works, this kind of intermediary solution is referred to as a side chain.

Additionally, Bitcoin transactions are final and cannot be undone; the only method to reverse the impact of a transfer is via the use of voluntary refunds. Since there is no administrator, no transaction can be denied or punished in any way. There being no administrator means that no transaction may be denied or punished in any way.

Furthermore, users of Bitcoin have the choice to either retain their funds in a Bitcoin wallet, which is also known as a dark wallet when it is stored on dark web exchanges, either on their own or with the assistance of a third party, or they may convert their Bitcoin holdings back into their country's native currency. The latter choice, depending on the technique that is used, may include

the possibility that one's identity will be revealed. In point of fact, the fact that "buyer beware" is a word that is often used in the Bitcoin sector should not come as a surprise to anybody.

As was previously indicated, a further distinction between Bitcoin and conventional currencies is that there is neither a central bank nor a jurisdiction that guarantees the quantity of money that is accessible. Instead, the Bitcoin is generated via a mathematical system that does not rely on a single central administration or monitoring body. Each Bitcoin unit may be broken into fractional units thanks to the currency's math-based issuance and incentive-based transaction recording. Despite the fact that Bitcoin's current ceiling of $21 million should not be reached until the year 2140, the currency's presence and spread will be increased as a result of this feature. The limitation on the number of Bitcoins that may be mined tends to point to the cryptocurrency's nature as that of a commodity, which is a topic that will be covered in more detail in the section that follows on potential Bitcoin regulatory frameworks. However, in contrast to conventional natural commodities, Bitcoin's supply limit is only theoretically enforced, and as a result, it is readily transformable. This adds an additional layer to Bitcoin's already complicated combination of characteristics.

The use of software and services like TOR (https://www.coindesk.com/tag/tor/), dark wallets, and Bitcoin-laundering services has indeed added an extra layer of complexity to the already anonymous nature of Bitcoin transactions. This further complicates the traceability of transactions, making it challenging for authorities and regulatory bodies to track and monitor potentially illicit financial activities. While these tools were developed with certain privacy and security considerations in mind, they have been exploited for various purposes, some of which may not be in the best interest of society.

The dark web, accessed through the TOR network, provides a space where users can operate with a higher degree of anonymity. While it was initially intended for privacy-conscious individuals and those living in repressive regimes, it has also become a breeding ground for various illegal activities, such as the sale of drugs, weapons, stolen data, and other illicit goods and services. The dark web's anonymity makes it difficult for law enforcement agencies to trace and apprehend individuals involved in such activities.

Dark wallets, which are Bitcoin wallets stored on the dark web, have made it even more challenging to connect transactions to specific individuals or entities. By using these wallets, users can obscure their identities and the flow of funds, making it difficult for external observers to link wallets to individuals. Bitcoin-laundering services, on the other hand, intentionally obfuscate the source of Bitcoin transactions. These services employ various techniques to break the chain of transactions on the blockchain. For example, some services link all transactions in the same Bitcoin address and send them together, making it appear as though they were sent from a different address. Others "comingle" different series of transactions, further complicating the tracking process.

While the development of these tools may have started with legitimate privacy concerns, they have, in many cases, been exploited for illegal activities, including money laundering, tax evasion, and financing of criminal enterprises. As a result, they have come under scrutiny from regulators and law enforcement agencies.

In the digital sphere, I believe it is crucial to establish a balance between security and privacy. Although privacy is an inviolable privilege, it must not be utilized to conceal unlawful behavior. Law enforcement agencies and regulators must adjust to the ever-changing digital currency and technology landscape in order to effectively investigate and prevent criminal activities. It is imperative that innovations that facilitate transactions that are more secure and private be developed and utilized responsibly, while maintaining a comprehensive awareness of the potential societal ramifications.

IV. BEYOND BITCOIN: A WORLD OF DIVERSE CRYPTO ASSETS

In the ever-expanding world of cryptocurrencies, Bitcoin was just the beginning. While Bitcoin remains the most well-known and widely used digital currency, it's essential to recognize that it's only one player in a diverse and rapidly evolving ecosystem. The success and popularity of Bitcoin have paved the way for a multitude of alternative cryptocurrencies, often referred to as "altcoins", each with its unique features and purposes. Altcoins offer a fascinating glimpse into the endless possibilities of blockchain technology. Some were designed to address specific limitations or challenges posed by Bitcoin, such as scalability and speed, while others explore entirely new use cases beyond digital currency. Here are a few examples of diverse crypto assets that have gained prominence:

1. Ethereum (ETH): Often regarded as the second-largest cryptocurrency by market capitalization (Reiff, 2023), Ethereum introduced the concept of smart contracts (Frankenfield, 2023). These self-executing contracts have opened up a world of possibilities, enabling decentralized applications (DApps) (Frankenfield, 2023) to run on its blockchain. Ethereum has become a foundation for decentralized finance (DeFi) (Sharma, 2023) and non-fungible tokens (NFTs), pushing the boundaries of what blockchain technology can achieve.

2. Ripple (XRP): Ripple is designed for swift, low-cost cross-border transactions and has garnered significant attention from financial institutions. It focuses on improving the efficiency and security of international money transfers, challenging traditional banking systems. In order to promote the adoption of its technology, Ripple has formed strategic alliances with a multitude of banks, financial institutions, and payment service providers across the globe. The integration of Ripple's solutions into established financial infrastructures has been facilitated by these partnerships, which has also enabled the broader adoption of XRP for cross-border payments (Tradeshala, 2023).

3. Litecoin (LTC): Often dubbed "silver" to Bitcoin's "gold" (Szlezak, 2023), Litecoin offers faster transaction confirmation times and is seen as a reliable digital currency for everyday transactions.

4. Cardano (ADA): Cardano is known for its scientific approach to blockchain development, emphasizing peer-reviewed research and a focus on sustainability (Pawlak, 2022). It aims to provide a secure and scalable platform for the development of DApps and smart contracts.

5. Chainlink (LINK): Chainlink focuses on connecting smart contracts with real-world data and events, enhancing the capabilities of decentralized applications by providing them with reliable information from the outside world (Oche, 2023).

6. Polkadot (DOT): Polkadot is a multi-chain network that aims to facilitate the interoperability (Hertz, 2023) of different blockchains, creating a connected ecosystem of diverse blockchains that can interact seamlessly.

7. Stellar (XLM): Stellar concentrates on facilitating low-cost, cross-border payments (del Castillo, 2017), making it a significant player in the realm of financial inclusion and microtransactions.

These are merely a few instances of the diverse array of cryptocurrency assets that extends beyond Bitcoin. The crypto landscape is in a constant state of change, with innovative solutions and new initiatives appearing on a regular basis. Upon further exploration of the cryptocurrency realm, one will discover that every asset fulfills a distinct function, thereby fostering the ongoing expansion and diversification of the crypto space.

Investigating these alternative cryptocurrencies not only expands our comprehension of blockchain technology but also demonstrates its extraordinary capacity to disrupt and innovate across numerous industries.

I. CONCLUSIONS

Throughout our inquiry into blockchain technology and the dynamic realm of crypto assets, we have examined the fundamental underpinnings of an unprecedented technological environment that persistently influences the trajectory of our digital age. In order to summarize, it is essential to examine three interrelated facets: the fundamental components of blockchain technology, the intricacies of Bitcoin transaction processing, and the wide array of crypto assets.

Blockchain technology, with its principles of decentralization, transparency, and immutability, stands as a remarkable innovation that has the potential to disrupt various industries. The blockchain's structure, comprised of blocks linked together in a chain, ensures the integrity of data, making it resistant to tampering and fraud. The consensus mechanisms, such as proof of work (PoW) and proof of stake (PoS), determine how transactions are validated and recorded on the blockchain. These foundational aspects serve as the bedrock for trust in a trustless environment.

Bitcoin, as the pioneer of cryptocurrencies, has showcased the practical application of blockchain technology. The decentralized nature of Bitcoin, coupled with its consensus mechanism, enables secure and transparent peer-to-peer transactions. Understanding the mining process, transaction validation, and the role of miners reveals the complexity and beauty of the blockchain’s operation. This knowledge empowers individuals to participate in the Bitcoin network and recognize the value of its underlying technology.

While Bitcoin remains the most recognized and widely used cryptocurrency, it’s crucial to appreciate the wealth of alternative crypto assets that have emerged. These diverse assets introduce innovative features and functionalities, from smart contracts and decentralized applications to cross-border payment solutions. The crypto asset landscape is continuously expanding,

demonstrating that blockchain technology is adaptable and has applications beyond digital currency. This diversity illustrates the dynamic nature of the crypto ecosystem and its potential to revolutionize various sectors, from finance to healthcare and supply chain management.

In conclusion, our journey through the blockchain jungle has illuminated the transformative potential of this technology. Blockchain, with its building blocks, serves as a foundation of trust in a world where intermediaries can be replaced with transparent, secure, and immutable systems. Bitcoin, as the flagship cryptocurrency, exemplifies the power of blockchain technology in facilitating secure, borderless transactions. Beyond Bitcoin, we've seen the emergence of a vibrant ecosystem of crypto assets, each contributing to the ongoing evolution of this groundbreaking technology. As we move forward, it's clear that blockchain and crypto assets will continue to shape our digital landscape, offering new opportunities and challenges. Understanding these building blocks, transaction processing mechanisms, and the broader crypto asset ecosystem will empower individuals and businesses to navigate this evolving terrain, embracing the potential for innovation, financial inclusion, and decentralization. The future of blockchain and crypto assets holds the promise of a more interconnected, efficient, and decentralized world. It's a journey worth following, and as participants in this transformative era, we have the opportunity to contribute to its ongoing development and success.

REFERENCES

1. Back Adam, Hashcash from 1997 http://www.hashcash.org/, Stuart Haber and W. Scott Stornetta, *How to Time-Stamp a Digital Document, in Journal of Cryptology (3)*, 1991, authors cited by Satoshi Nakamoto in his paper introducing the Bitcoin.
2. Camerer C., *Bubbles and fads in asset prices*, Journal of Economic Surveys 3 (1): 3–41 apud Härdle. W Campbell R. H., Reule. R, Understanding Cryptocurrencies, 2019, p. 24, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3360304
3. Castillo (del) Michael, *IBM's Stellar Move: Tech Giant Uses Cryptocurrency in Cross-Border Payments*, available at: https://www.coindesk.com/markets/2017/10/16/ibms-stellar-move-tech-giant-uses-cryptocurrency-in-cross-border-payments/
4. Cong L. W., He Z., *Blockchain Disruption and Smart Contracts*, 2017, p. 7, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2985764
5. Federal Reserve Board, *Bitcoin: Technical Background and Data Analysis*, 5, available at: http://www.federalreserve.gov/econresdata/feds/2014/files/2014104pap.pdf
6. Frankenfield J., *Decentralized Applications (dApps): Definition, Uses, Pros and Cons*, available at: https://www.investopedia.com/terms/d/decentralized-applications-dapps.asp
7. Frankenfield J., J. J. J. *What are smart contracts on the blockchain and how they work*, available at: https://www.investopedia.com/terms/s/smart-contracts.asp
8. Hertz L., 2023. *Polkadot to revolutionize multichain for Web3*, available at: https://medium.com/coinmonks/polkadot-to-revolutionize-multichain-for-web3-b1cdba933973
9. Hughes S.J., Middlebrook S.T., *Advaning a Framework for Regulating Cpocurrency Payments Intermediates,* 32 YALE J. REG, 2015.
10. International Monetary Fund, *Virtual Currencies and Beyond Virtual Currencies and Beyond Initial Considerations*, 5, available at: https://www.imf.org/external/pubs/ft/sdn/2016/sdn1603.pdf

11. Jeffries A., *Blockchain is meaningless*, 2018, available at: https://www.theverge.com/2018/3/7/17091766/blockchain-bitcoin-ethereum-cryptocurrency-meaning
12. Mills D. *et al*, *Distributed ledger technology in payments, clearing, and settlement*, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2881204
13. Mullan P. C., *The Digital Currency Challege - Shaping Online Payment Systems Through U.S. Financial Regulations*, Palgrave MacMillan eds., 1st ed. 2014.
14. Nakamoto S., *Bitcoin: A Peer-To-Peer Electronic Cash System*, Bitcoin, (2008), available at: https://bitcoin.org/bitcoin.pdf
15. Oche E., 2023. *Chainlink 2.0 and the Future of Decentralized Oracle Networks*, online: https://medium.com/@estheraladioche569/chainlink-2-0-and-the-future-of-decentralized-oracle-networks-c5823178bbf0
16. Pawlak J., 2022. The Role Of Cardano In Sustainable And Ethical Cryptocurrency. https://blog.netcoins.com/the-role-of-cardano-in-sustainable-and-ethical-cryptocurrency
17. Piazza F. S., *Bitconin and the Blockchain as possible corporate governance tools: strenghts and weaknesses*, Penn State Journal of Law and International Affairs, volume 5, no. 2, 2017.
18. Quintais J. P. *et al*, *Blockchain and the Law: A Critical Evaluation*, Stanford Journal of Blockchain Law & Policy, 2(1), 1-26, 2019.
19. Reiff N., 2023. *Bitcoin vs. Ethereum: what's the difference?*, available at: https://www.investopedia.com/articles/investing/031416/bitcoin-vs-ethereum-driven-different-purposes.asp
20. Richards K., *What is Cryptography?*, available at: https://www.techtarget.com/searchsecurity/definition/cryptography
21. *Ripple Coin (XRP): Revolutionizing Cross-Border Payments and Beyond*, available at: https://www.linkedin.com/pulse/ripple-coin-xrp-revolutionizing-cross-border-payments-beyond
22. Sharma R., *What is Decentralized Finance (DeFi) and How Does It Work?*, available at: https://www.investopedia.com/decentralized-finance-defi-5113835
23. Szlezak T., 2023. *A comprehensive analysis of the digital silver known as Litecoin*, available at: https://addicted2success.com/cryptonews/a-comprehensive-analysis-of-the-digital-silver-known-as-litecoin/#:~:text=Amidst%20this%20plurality%2C%20Litecoin%2C%20often,the%20meme%2Ddriven%20Shiba%20Inu
24. Tasca P., *Digital Currencies: Principles, Trends, Opportunities, and Risks*, Deutsche Bundesbank research report 2015, available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2657598
25. Volpicelli G., *Beyond Bitcoin: Your Life is Destined for the Blockchain*, Wired Magazine 2016, available at: www.wired.co.uk/article/future-of-the-blockchain
26. https://www.fatf-gafi.org/content/fatf-gafi/en/publications/Fatfgeneral/Fatf-fintech-regtech-forum-may-2017.html
27. https://www.fatf-gafi.org/en/the-fatf.html
28. https://www.google.com/finance/quote/BTC-USD
29. https://www.ibm.com/topics/blockchain
30. https://www.investopedia.com/what-went-wrong-with-ftx-6828447
31. https://www.outlookindia.com/outlook-spotlight/dogecoin-price-drops-in-crypto-crash-as-twitter-sued-new-predictions-news-236449