

The Emergence of Block chain Technology and its Economic Significance

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ABSTRACT: This paper analyses the innovative aspects of blockchain technology and provides a comparative research between existing centralised and the distributed ledgers as introduced by this new advancement. The growing inclination towards crypto-currencies and other forms of digital currencies evokes the necessity of assessment of the same from an economic point of view. The blockchain technology enables its participants to perform transaction without the need of any central authority. While this technology has gained immense popularity in a very short span of time, yet this revolutionary technology has tremendous potential to shift economic markets to a different dimension all together. This paper aims to systematically explain the economic prospects of this new technology related to digital currency and establish its significance, if any in the current economic scenario.

Keywords: Blockchain Technology, Decentralized Ledger Technology, Crypto-currency, Non-Fungible Tokens

1. Introduction:

Blockchain is a decentralized ledger of transactions across a peer-to- peer network. This technology enables its participants to perform transaction without the need of a central authority. What appears to be revolutionary Information and Computational Technology (ICT), blockchain has played a better role in bringing huge changes in the fields of economic activities and digitization of assets. It is a derivative of the Digital Ledger Technology (DLT) which acts as a decentralized database. Blockchains are DLTs with an immutable cryptographic signature called a hash function. The function provides an identity to each transaction on the blockchain. Each stakeholder becomes a node for the P2P transactions that eliminates the use of intermediary third party which increases the reliability of the transaction. This resolves a key barrier in economic exchanges regarding the lack of trust among the anonymous agents involved in the transaction. Advent of digitization has been

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seen in the art and culture industry as observed in the transformation of digital or physical ownership authenticity certificates of assets into strings of 0s and 1s as NFTs.

The literature associated with blockchain technology is limited. Swan, M. (2015). *Blockchain: Blueprint for a new economy*. O'Reilly Media, Inc. regards blockchain as a future standard global economy. Aste, T., Tasca, P., & Di Matteo, T. (2017). *Blockchain technologies: The foreseeable impact on society and industry*. offers a perspective on the challenges, the future opportunities and the foreseeable impact of Blockchain and distributed ledger technologies in industry and society. The Ethereum Whitepaper (2014) by Vitalik Buterin deserves a mention as a useful reference and an accurate representation of the Ethereum Blockchain and its vision. Mettler, M. (2016). *Blockchain technology in healthcare: The revolution starts here*. In 2016, IEEE 18th international conference on e-health networking, applications and services (Healthcom). Public healthcare management, user-oriented medical research and drug counterfeiting in the pharmaceutical sector, this report aims to illustrate possible influences, goals and potentials connected to this disruptive technology. Other papers deal with the architecture and overview of blockchain and cryptocurrencies (See, Zheng, Z., Xie, S., Dai, H., Chen, X., & Wang, H. (2017, June). An overview of blockchain technology: Architecture, consensus, and future trends. In 2017, IEEE international congress on big data (BigData congress) (pp. 557-564). Ieee. Niranjana Murthy, M., Nithya, B. N., & Jagannatha, S. J. C. C. (2019). Analysis of Blockchain technology: pros, cons and SWOT. *Cluster Computing*, 22(6), 14743-14757.)

2. Blockchain as a decentralized ledger

2.1 Centralized ledger

Traditionally, the economic model of the market has been based on a centralized nature of financial institutions. This can be seen in their control over total money supply in the economy as well as the central bank's influence over the other independent banks. The central bank reserves the right to create currencies and ensure price and financial stability [1]. Some significant problems go unaddressed in this traditional approach to the economy which have since been addressed in this newer alternative.

2.2 Bitcoin and need for decentralization

During a period of uncertainty and a lack of trust on financial institutions after the 2008 Subprime Mortgage Crisis, an individual under the pseudonym Satoshi Nakamoto introduced

the world to Bitcoin which was the first application of the revolutionary Blockchain technology. The goal was simple, to reduce the impact of third party involvement in online transactions and remove the cost, hassle and the trust factor associated with it [2]. More than a decade later thousands of altcoins has been created, catering to various specific utility and facilitating online transactions.

2.3 Benefits of decentralization

Creation of a newer technology always has its origin in the solution of a particular existing problem. In the case of decentralisation, its benefits can be mentioned as:

Table 1: Benefits of Decentralized Ledger Technology

Data Security	Rather than being located on a single server data is uniformly distributed to a number of node operators. This reduces the risk of data breach as, to be able to launch a major attack on the blockchain the malicious actor has to gain access to more than 51% of the network. A feature called hashing is used to encrypt the data stored in the chain. Each block in the chain contains “hash” of the block header of the previous block, if an attempt to double spend or modify the ledger is made, the individual has to change the hashes in all previous blocks [3]
Reduction of market power	The market would be fairly competitive. Cryptocurrency exchanges are open to all and there are no barriers to enter the market. It also enables stake holding of the future of an entity on the chain
Reduced costs	Intermediaries present in centralised system of transactions have to be paid in order to receive their functionality. In the case of DLTs Removal of these middle-men have

	reduced the cost of transaction tremendously
Enabling liquidity and value exchange	Along with its practical usability most of the cryptocurrencies are bought with an expectation of appreciation in value. Tokens usually deploy various mechanisms to appreciate the value like burning some of the total crypto in circulation thus creating scarcity or even due to speculations
Transparency	Registering data on ledgers managed by peers and digital “smart contracts” brings in great level of transparency. The non-requirement of entrusting a human with the responsibility of overseeing the transaction have led to a corruption free system.

Source: Author’s compilation

3. Blockchain as an investment:

3.1 Cryptocurrencies

To mitigate the high transaction fee and third party dependency of traditional fiat, the need for cryptocurrency arises. Cryptocurrencies utilizes hashing to ensure legitimate, unique transactions .It is a virtual coinage system with no intrinsic value that acts as an actual fiat currency, enabling users to provide virtual payment for goods and services free without any third party intermediary [4]. After the huge success of Bitcoin as the first cryptocurrency, due to its open source nature, several other versions emerged catering to particular specific functionalities these are referred to as altcoins. To fund the development and launch activities of projects the developers of these tokens offers initial coin offerings (ICOs). Here comparison may be drawn to IPOs in the stock market scenario.

3.2 Investing in cryptocurrencies and Portfolio diversification

Investing in cryptocurrencies can lead to substantial returns along with a substantial risk with it being a very volatile market [5].

Table 2: Returns of Investment in Crypto currencies with respect to dates

Date	Bitcoin(BTC)	Ethereum(ETH)	Litecoin(LTC)	Tron(TRX)	Cardano(ADA)
06 January 2019	\$4,076.63	\$157.75	\$39.30	\$0.023	\$0.04926
05 May 2019	\$5,795.71	\$163.45	\$75.98	\$0.02342	\$0.06615
01 September 2019	\$9,757.97	\$171.63	\$66.14	\$0.01563	\$0.04454
05 January 2020	\$7,411.32	\$136.28	\$43.55	\$0.01362	\$0.03472
03 May 2020	\$8,897.47	\$210.93	\$48.27	\$0.01602	\$0.04893
%age Change in value	+118.26%	+33.71%	+22.82%	-30.34%	-0.66%

Source: Coinmarketcap [6]

A portfolio with equal investment in each asset consisting of 5 random cryptocurrencies from the top 20 Market Cap Cryptocurrencies for a random time period of 1 year and 4 months lead to a total change in investment by +143.79%.

This in no way is an accurate representation of a portfolio and is only meant to depict the potentiality of cryptocurrency as a high risk high reward investment. An actual cryptocurrency portfolio should be diversified as formulate a compromise between risk and profitability. A question arises if cryptocurrencies in itself can provide enough diversification. A correlation between the variance of bitcoin and the altcoin prices has been seen [7]. Thus, sticking to only cryptocurrencies cannot be a diversified portfolio. Cryptocurrency investment should be a part of a bigger investment strategy.

3.3 Non Fungible Tokens (NFTs)

A token is a digital representation of goods, services or other form of value or utility. Fungibility is the property when two things are identical in specification, where individual units can be mutually substituted. NFTs are digital versions of a real-world, tangible item or only a digital asset stored on the blockchain. It can be anything ranging from an artwork, music to even in app purchases in video games. Each NFT acts as a digital signature and cannot be swapped for another one of the same kind. The majority of NFTs reside on the Ethereum blockchain. The value of an NFT is determined by the demand in the market and thus it can be bought and sold as any physical type of art. NFTs are seen as a huge investment opportunity as quite often they are turned for huge valuations. Tokenized real estate is a quite popular as an NFT. A VR game Decentraland [8] allows the players to purchase virtual land within the game. Since its inception in 2017 investors have bought millions of dollars' worth virtual land in hopes of an increment in the demand of the non-inflating asset, resulting in a huge price surge.

4. Way Forward:

Blockchain is one of the most innovative and disruptive technology of the 21st century. Its correlation and assimilation with the modern day economy is inseparable. The benefits of using decentralized ledgers as opposed to continuing the dominant usage of centralization is established. Potential of crypto currency as an investment instrument is analysed and general consensus to consider it as a part of a greater scheme of investments is expected. Blockchain is not just an ICT innovation but a new governance of the economy as well as a driving force in capitalisation at large. The ever changing dynamics of world economy gives blockchain technology a hope of sustaining in the market for a long time. However, not many people are aware about this striking technology and what potentialities it possesses in generating income and capturing the market at a large scale. Thus, it is important on the part of the researchers too, to consistently check for its position in the market and explore its unrealized attributes.

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