

Blockchain Features May Control Inflation

Suhasani Chouhan

Indian Institute of Technology Delhi
Email: [chouhansuhasani\[at\]gmail.com](mailto:chouhansuhasani@gmail.com)

Abstract: *In this article, we will describe our inflation study report and how blockchain might help minimize it. To begin, we'd want to discuss inflation and subsequently on Blockchain, including its characteristics and components such as decentralization, consensus mechanisms, hash functions, cryptography, Proof of work, Proof of stake, smart contracts, and more. We'd want to cover this briefly in simple words so that our readers understand. Later in the paper, we will discuss our main concern, inflation, and how Blockchain can assist control it.*

Keywords: Inflation-Situation in which there is more money than supply
Blockchain- Its a decentralized network, where participants can transfer data.
Cryptography- Generating codes to secure data
Decentralization- All participants in a network rules together.
Consensus mechanism - To mine every block there are several mechanisms.

1. Inflation

Inflation is defined as a scenario in which there is more money in an economy than there are items to spend it on. Instead of throwing a bunch of terminology at you, we'll give you a practical hypothetical case to help you grasp it better.

Consider a circumstance in a country that is experiencing adversity, such as a pandemic. What would people do in that country? So they sit at home and work from there. In those circumstances, all they care about is delicious food and Netflix. As a result, various sectors and markets come to a halt for the simple reason that no one is buying anything. The next thing that will happen is the beginning of a collapse in the entire system, but the government has to stop it, and the only way to stop it is to force people to buy things they did not want to buy. The government utilizes several tactics to accomplish this, such as cutting tax rates on goods, lowering loan interest rates so that people can take out loans and buy products, and occasionally directly depositing money in people's banks to do so. What follows could even lead to worse outcomes. Now that individuals have extra money, they begin purchasing items in large quantities, and everything appears to be OK for a little while. But now that people are buying commodities in large quantities, those goods are practically running out, and a situation of inflation is brewing. Industrialists and markets now have two options: either let things happen and their materials and goods simply disappear into thin air, or start boosting the pricing of their items. They go with the second option. Today that individuals have bought items, they don't have money to buy more, and prices are skyrocketing, resulting in a recession and who knows what the country's faith will be today.

So much for inflation, what is it doing here now? If you read the above tale attentively, you will notice that the most simple method of inflation is for the government to issue the notes. That does not happen in cryptocurrencies, at least not in all cases. Before jumping into the motive of the article let's understand Blockchain briefly.

2. History of Money

The main application of blockchain to transfer, sell, and buy commodities. If we examine the history of the early period's exchange of goods, civilization was dominated by the barter system, which was obviously unsustainable due to its complexity and lack of flexibility. Coins were quickly introduced circa 600 B.C. Lydians used the coin for the first time. Even yet, carrying so many loads for large deals was not simple. Thus, banknotes. Chinese inventors first created banknotes in 1700. With the passage of time, evolution provided simpler and more adaptable ways to conduct a commodity trade. These banknotes are only pieces of paper with a predetermined face value. Banknotes were eventually used on a straightforward card secured with a pin for bank transfers in 1950. However, technology is always improving and has developed a new magic wand called Blockchain.

When one of our friends first told us about the blockchain, we were astounded because the technology it is based on is incredible. Decentralization is the idea of reducing reliance on all middlemen, banks, governments, and organizations to open up access to the general population. Many of them are threatened by blockchain technology, but there is undoubtedly a new future on the horizon.

3. What is Blockchain?

Multiple institutions can trade, sell, or transfer data on this decentralized ledger without the need for a middleman or centralized organization. This contains complete data transparency. In a network, everybody has the right to view the information. Blockchain protects its data using cryptographic techniques that utilize hash functions, which we shall delve into more detail later. Blockchain may be summed up as a decentralized platform that enables quick and safe peer-to-peer transactions.

It is trustless, which could sound bad, but is actually just a way of saying that we don't need to rely on any institutions or specific people to exchange goods here, which

undermines trust in the system. You can freely do cryptographic transactions on the blockchain.

4. Fundamentals of Blockchain

A continuous series of records called Blocks that are connected by a system called cryptography make up a blockchain. Crypt means to secure and graphy means writing. Cryptography is a technique for safeguarding data, information, or transactions using any sort of codes to hide them from particular organizations. Thereby preventing the unauthorized use of some information. In blockchain, each block is encrypted by a hash function, which is a mathematical function that employs text or numbers to generate a unique code for each iteration of the block. A hash function converts a significant number or string into a tiny integer that can be used as the index in a hash table. This hash function is the connecting factor between the blocks. Assume the hash for the first block is 0, and when you enter the data, it generates some specific hash function for this block. Now, the previous hash function is the connecting link to the new block, and the new hash computed after inputting the data in the present block is the connecting link to the next block.

As blockchain is a new technology, there will be bumps along the road. The first issue that surfaced was the Double Spending Problem. When a token was created, it might be used twice or more times. Because every problem lends itself to a new solution, the solution was Bitcoin. Bitcoin tackles the problem of double spending by utilizing decentralization and providing all of its members with history access, ensuring that no coin is used twice.

Every block in a blockchain network is typically mined by miners, who solve cryptographic puzzles using high computational mathematics and dedicate significant energy and time to the process. The purpose of mining is to find a valid hash that meets certain criteria, such as having a specific number of leading zeroes. When a miner successfully produces a valid hash that satisfies the required criteria, they are granted the right to create a new block and add it to the blockchain. This process involves appending the new block to the existing series of blocks, creating a chronological and immutable record of transactions or data. A miner may own a block but he doesn't own the entire blockchain.

The mining process is rigorous and involves many mechanisms of consensus which are used by blockchain. Miners also need to validate the transaction within the block using consensus mechanisms with the other participants in the network. Let's discuss more about the consensus mechanism.

Consensus mechanism

Let's start with some questions before we get into the mechanism.

Who is in charge of the ledger?

Who decides whether or not a transaction is valid?

Who creates new coins?

Who makes the changes in rules?

These will be answered by the definition of consensus. It is a blockchain mechanism that is synced such that all network participants agree on the status of the digital ledger. This assures that all nodes or participants in a network agree on the authenticity of transactions. This mechanism is responsible for ensuring the data's integrity and security. To further grasp it, let's go over different consensus mechanisms, what they are, and what drawbacks they have.

Proof of work

Network miners use regress processing and electrical energy to find valid hash functions. When a miner completes it, he is paid with additional currencies or crypto blocks in exchange for adding new data to a blockchain. However, this mechanism is time-consuming and energy-intensive. As a result, a new and improved system for proof of work was developed.

Proof of stake

This is an alternative to proof of work. This mechanism works by selecting validators in proportion to value holdings in a network. Although nothing at stake may make it vulnerable and prone to attack. Blockchain is just not a medium for payments but has a lot more to offer, like the Proof of authority.

Proof of authority

Proof of authority provides information about who owns the intellectual property, who has owned it in the past and for what duration. One can ensure the authenticity of the product by deriving the history of the same.

Now lets see some use case of blockchain

The first is that it is most commonly used to transfer money; secondly it also provides proof of ownership, furthermore it provides users with a new identity and many new services like new smart contracts to engage in complex negotiations. These are some major uses of blockchain.

Now that we've reviewed the Blockchain system briefly, we should be able to understand the basics and the mechanisms involved. We may discuss inflation in Blockchain, what it is, and how Blockchain can assist control it.

Inflation monitored by Blockchain

On the basis of inflation rate, there are three types of inflation: creeping inflation, trotting inflation, and hyperinflation. There are another three types of inflation based on their causes: demand pull inflation, cost pull inflation, and structural inflation. In an economy there may be some possibility of creeping inflation, which is considered to be good, but trotting and hyperinflation can be effectively controlled. All of these can be regulated using blockchain technology as it provides transparency and trust in the system.

Let us now examine how Blockchain can govern each sort of inflation.

Creeping inflation: This is a sort of inflation in which the rate fluctuates between 3% to 5%. This is essentially a condition in which supply and demand may be managed.

Blockchain technology can help to control inflation by increasing openness and trust in the economy.

Trotting inflation: This sort of inflation has a rate difference of about 10% throughout the year. This is a situation in which there is more demand than supply, resulting in a price increase. Blockchain's decentralized nature grants it the ability to provide real-time data consistently and immutably. This unique feature enables swift detection and resolution of issues as they occur, fostering a seamless environment for discovering and addressing problems in real time.

Hyperinflation: In an economy where the inflation rate is beyond control, a critical condition arises, possibly reaching as high as 50%. This situation can be attributed to a variety of factors, including both environmental and human-induced causes. However, if individuals are integrated into a blockchain network, they can harness its inherent decentralization and cryptographic properties to potentially mitigate or avert such a scenario. By leveraging these features, the economy may have a chance to recover or prevent further escalation. To gain a comprehensive understanding of the demand and supply aspects, let's delve into the examination of the other three types of inflation.

While demand is something that blockchain cannot manage, cost-push inflation is something that blockchain can. How? Here's how blockchain can provide solutions to all three that can be blended into one.

Cryptocurrencies are decentralized from established monetary systems. In times of inflation, features such as decentralization and controlled supply of currencies (bitcoin) can be translated to other media. Because the number of money or coins in a crypto is limited, there is no chance of more money in the market than commodities, which can avoid inflation.

Consider the following scenario: if there is a scarcity of particular commodities in a market and the money is in the form of Bitcoins, which are limited in number, the value of the same amount of Bitcoin will rise in the interim. Hence controlled inflation and its effects on the network.

Let us see some further Blockchain properties. We're talking about smart contracts with network-defined rules that will have a restricted supply and token distribution. Furthermore, the decentralization of the entire system places power in the hands of each member of the network rather than a single authority. Hence Inflation is a factor that can be controlled by the Blockchain

5. Conclusion

So from our overall study we can come to a conclusion that yes there are several ways in blockchain that inflation can be controlled, as there is no centralized authority to govern, participants in the network can choose their own rules and regulations. But now the point comes is will governments allow to loose the stake on money, mostly answer is a big No. That's why in many countries governments have banned the exchange of blockchain money as the means of

commodity. Looking ahead, the potential of blockchain continues to grow, bringing disruptive opportunities that cannot be overlooked. It is critical that we welcome and embrace blockchain innovations, since they hold the key to changing industries, procedures, and society as a whole. By fully embracing blockchain technology in the future, we will be able to realize its enormous potential, accelerate innovation, and create a more efficient, transparent, and safe world.

References

- [1] E01612834.pdf (iosrjournals.org) , Author - Naresh Kanwar
- [2] blockchain in economy - Search (bing.com)
- [3] What Are Consensus Mechanisms in Blockchain and Cryptocurrency? (investopedia.com)
- [4] https://www.researchgate.net/publication/346517973_A_Review_of_Blockchain_Consensus_Mechanisms_State_of_the_Art_and_Performance_Measures , Author Thanshya Thanujan