



Dynamics of cryptocurrencies

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Abstract

From creating a buzz word to a disrupting economic innovation, Cryptocurrencies have come a long way. It does have the capability to transform our present economic structure and modify the way in which our banks and financial institutions operate. Much has been discussed about blockchain-based tokens lately, Prices of tokens have soared, startups are raising millions in token sales within seconds, and every venture fund in the world is now discussing what to make of tokens internally. In the course of this paper we shall evaluate the industry penetration and impact of cryptocurrencies as well as conclude on the future potential it holds.

Keywords: bitcoin, cryptocurrency, finance, ICO, blockchain

1. Introduction

Cryptocurrencies have accelerated a digital transformation of the financial world by acting as an alternative payment system and digital asset. If we were to avoid the initial resilience towards cryptocurrencies, the user adoption has been visibly significant, with billions in market cap and millions of active wallet users in 2017. As the lines between exchanges, crypto wallets and banks have blurred, the number of cryptocurrencies have grown beyond 'bitcoin', the de-facto cryptocurrency earlier known to the world. Despite of its disruptive nature, there is a lot of perplexity about efficiency of Cryptocurrency. Given the volatile nature of such cryptocurrencies, Governments, Financial Sectors and Regulatory bodies are yet debating on a unified way to adopt or rather control the flow of the cryptocurrencies into regional economy.

This paper shall holistically examine the burgeoning global cryptocurrency industry and its impact on world economy.

2. What is Cryptocurrency?

A cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange using cryptography to secure the transactions, to control the creation of additional units, and to verify the transfer of assets^[1]. It is a form of digital money transaction that is intended to be anonymous yet protected. Cryptocurrencies are protected and encrypted using mathematical algorithm, which makes it immutable, i.e. supply of the coin is linked with default algorithmic rate making it impossible to cross the set limit. Unlike in conventional transactions where your bank or other financial institution validate and assure your transactions; incase of cryptocurrency transactions are confirmed by your computers which has logged into the currency's network. The small transaction fees for cryptocurrencies are often shared with the users of such computers, who are called miners. Bitcoin was the foremost cryptocurrency introduced to the world in 2009 by a fictitious developer named Satoshi Nakamoto. It uses SHA-256, which is a set of cryptographic

hash functions designed by the U.S National Security Agency and is based on the proof-of-work system. The number of cryptocurrencies available over the internet as of 27 November 2017 is over 1324 and growing^[2]. In this paper, we shall explain Bitcoin and altcoins (other cryptocurrencies) for sake of illustration.

2.1 Bitcoin

Bitcoin is a pioneer cryptocurrency and universal payment system, first of its kind i.e. decentralized digital currency, as the system works in absence of a central repository or single administrator. It is more of a peer to peer system where the transactions take place between users directly, without any mediator^[3]. Each and every transaction is recorded digitally in blocks which serves as books or ledger and once a block is filled completely a new block is automatically created. All these blocks are connected one another using hastags and then a linear chronological sequence of these blocks forms a blockchain. Hence, it can be clearly concluded that digital recording of transactions provide the much needed security at the same time information of the participating parties are withheld and not revealed. The money itself can only be tracked when the transaction is finally converted into cash. These transactions are verified by network nodes and recorded in a public distributed ledger called a blockchain.

Bitcoin is also commonly termed as decentralized digital currency, as it helps in digital transactions between two parties without the interference of an mediator. All the transactions are processed and stored on decentralized servers.

2.1.1 Market Statistics

Bitcoin, which is now popular for its sky-high exchange rate was initially seen more like a speculative investment than a currency. It has come a long way, not only in terms of recognition but also in terms of its value. The value of the first bitcoin transactions were negotiated by individuals on the bitcoin talk forums with one notable transaction of 10,000 BTC used to indirectly purchase two pizzas delivered by Papa

John's. [4] This happened around May 2010, when the value of bitcoin was less than \$0.01. As of 28 November 2017, Bitcoin price surpasses the \$10,000 mark for the first time [5].

Below is the historic data demonstrating the steep rise in the price of bitcoin.

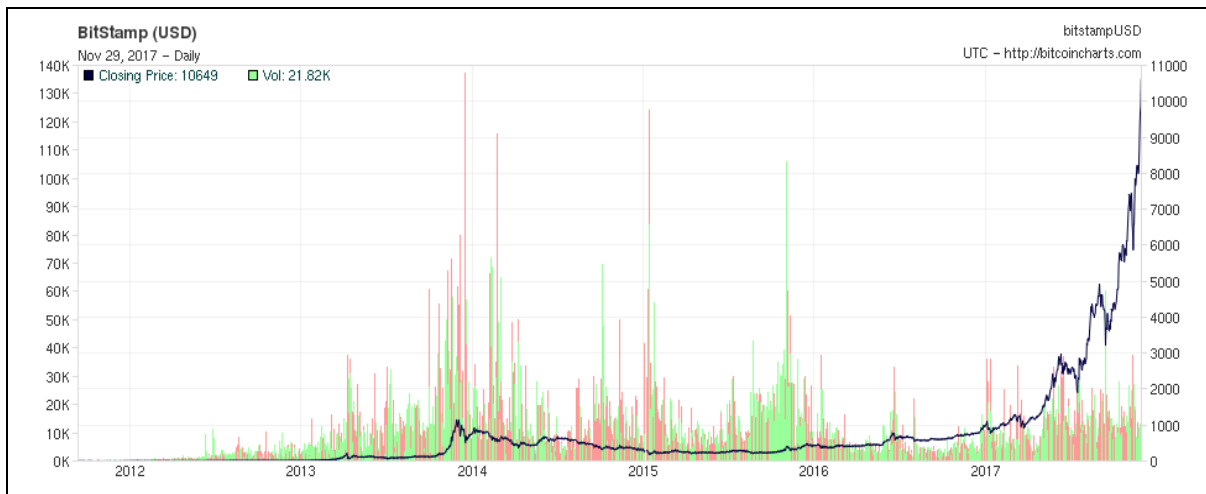


Fig 1: Image Source [6]

There are a number of factors that have influenced the bitcoin price. Every day there are about 50 articles that predict the closing index benchmark for bitcoin. The media's excitement can effortlessly increase the price; at the same time negative news can lead to steep fall in the price. For example, any rumor or news about any bankruptcy or hacks on any bitcoin connected websites and services can result in fear and commotion among bitcoin users, resulting in price dips. At the same time pessimistic news about governments association and regulations as well as news on the use of bitcoins in illegal transactions such as money laundering and drug transactions have similar impact on the bitcoin price [7].

The Political environment and activities of the world's top economy has also had a direct impact on the price of bitcoin. World has witnessed the economic crisis of Greece in 2015, well there were reports stating that greek citizens were

increasingly buying Bitcoin in order to protect their wealth. Bitcoin was considered a safer bet as compared to Euro that time. But this did not seem to affect the price of Bitcoin on global markets which was steadily fluctuating; in between \$300 to \$400 for most part of the year that time. But the anxiety about the national referendum for Britain to leave the European Union (Brexit) on June 23, 2016 did result in increase in the price of Bitcoin and simultaneous decrease in value of British pound. The pound started dipping from around May 20, 2016 and by July 25 it was more than 10% below its pre-Brexit value. During the same period, the price of Bitcoin increased by over 65% (from £302 to £502). The election result of US and Donald Trump being elected as the US president did led to steep rises in the price of Bitcoin for the next to months. Many analysts associated this to the uncertainty in the US economy [8].

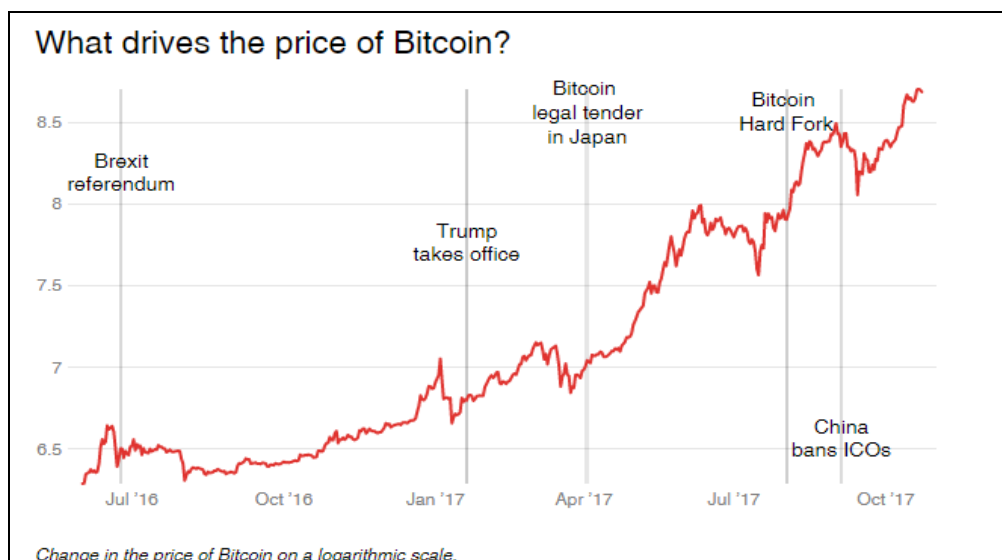


Fig 1: Image Source [8]

The demand and supply curve for bitcoins have been affected by a varied number of factors. These factors are diverse and unpredictable. Knowing these factors alone cannot make the bitcoin price more predictable as the investors do not belong to a single continent and are geographically distributed.

However, as with the amplified usage and wider acceptance of Bitcoin, the demand for bitcoins will always be ever-increasing. Since the total number of bitcoins that can be in circulation must never exceed 21 million, the only factor in the equation that can shift is the price of bitcoin.

2.2 Alt Coins

Owing to the visible success of bitcoin, a large number of startups have launched their own cryptocurrencies, such as cryptocurrencies fall under a common group called AltCoins or Alternative Coins, since they are seen as an alternative to Bitcoin.

These internet-based digital currency platforms are built on the same principals of bitcoin. A decentralized public ledger is a factor common to most of them. An additional frequent constituent of these public ledger platforms is an incentive system that elicits efforts from a distributed global workforce to verify and record transactions on the public ledger and a governance system for the platform. Similar to bitcoin these platforms work on a peer to peer economy. There differentiating strength lies in the way these platform work and the utility their underlying cryptocurrencies offer.

The main difference in the ALT-Coin is the encryption algorithm used in the creation of them. For instance, there are Altcoins using SHA-256, the same hashing algorithm as Bitcoin viz. Namecoin (NMC) and Bytecoin (BTE); Then there are Altcoins using script algorithm such as Litecoin (LTC) and GoldCoin (GLD); Lastly there are Alt coins using other, innovative hashing algorithms such as X11, X13, X15, NIST5, 100% POS, which falls under Hybrid and CPU alternate cryptocurrencies, like Ether (ETH) and DarkCoin (DRK). The leaders of the ALT-Coin field are Ethereum, Bitcoin Cash, Ripple and Litecoin.

Since the Alt-Coins project themselves as better substitutes to Bitcoin, the competition will lead to better incentive and governance systems for public ledger platforms.

3. Impact on world

3.1 How has Bitcoin changed the global economy?

Economy as a term encompasses activities related to everything right from production, consumption to trade of goods and services in a country. It symbolizes progress of the country. Since exchange is something without which you cannot perform any of the economic activities. This is where the role of currency comes into play. To issue currency we are depended on trusted parties like government or central bank.

When it comes to crypto currencies the basic point is no single government can have a control over them thereby making them politically influential.

When we hear about abolishment of large bank notes it reflects the war for cash. The main agenda of such extreme step is total economic control of money by both the government and the banks. Although it is targeted on black money or money laundering somewhere it disturbs the life of citizens as well. This is where Bitcoin is challenging the

traditional methods. Let us look at some of the positive and negative impact that these can have on the world economy.

3.1.1 Positive Impact on Economy

- **Legal Tender:** Many countries have joined hands in making bitcoin a legal tender, which means that it cannot only be used as a payment method but also to pay taxes and settle debts.
- **ATMs:** The number of ATMs in the world have surpassed the mark of 1500 making its impact on the daily life of an individual. A currency which did not existed 10 years back is now being increasing accepted by small merchants and websites as a mode of payment.
- **Status of Dollar:** Dollar has been the currency of choice when it comes to international trades. Gradual acceptance of bitcoin will have an impact on US dollar as the world's international reserve currency. Since bitcoin is a borderless currency it may turn to be a preferred mode for trades in the near future.
- **Global currency:** Popularity of bitcoin has resulted in economic power shifting hands from government and central bank to masses. Earlier central bank and financial institution had vested powers to scrutinize and record all transaction but with advent of such digital currency this influence will be to a great extent challenged by people. When used on a large-scale bitcoin in the near future may politicize economy.
- **New Market:** Definitely, crypto currencies have opened doors for new markets. A market governed by cyberspace. The concept of almost nil transaction cost has stared catching attention of many; making them superior to traditional currencies.

3.1.2 Negative Impact on Economy

- **Speculative Stock:** We have all seen dotcom bubbles or the mortgage bubbles somewhere Bitcoin too has the potential of becoming a bubble in near future. The new high that the stock is touching every day is making it more and more susceptible on becoming a speculative stock. At the start of 2017 it was valued around 1000 and currently it is trading above 11000 showing exponential gains in a period of just 11 months.
- **Role of central government and banks:** without the control from governments and banks bitcoin will encourage money laundering and will be an unpredictable form of currency. Time and again loopholes in the current banking database about money transactions are being highlighted with the advent of crypto and cyberspace.
- **Borderless currency:** Cryptocurrencies are not controlled or monitored by any one state, making them borderless. It is more of an agreement between two parties. It seems to be a good arrangement so far as it could help facilitate smooth trade but then again without proper control and direction monetary policy of the trading states will be either too tight or too loose.

4. The Impact on cryptocurrencies in India

4.1 Laxmi Coin

India might soon join the club by introducing its very own crypto currency, called Laxmi coin; to begin with Laxmicoin

is a digital crypto currency which has been stuck in a legal battle for approval since 2012 like various non-fiat currencies. Although there is no formal announcement from government, the official website of Laxmicoin states its release date as 1st March 2018.

A committee of officials from the Securities and Exchange Board of India (SEBI), the RBI, the Central Board of Excise and Customs (CBEC), the Income Tax Department, and the Financial Intelligence Unit had been discussing potential to identify how blockchain as a form of technology can be used by our financial institutions and banks.

So, if Laxmicoin does get legal agreement from RBI and government of India then it surely will be one of the highest customer coin market because of it is launching in India.

In India, the lawmakers still feel it is important to have a strong legal system backing for the crypto currency rather than just being flown with the phenomenal acceptations that such currencies are generating off late. This means that the crypto currency will be under legal purview there by defeating the basic definition of cryptocurrency which is not controlled by any agency or government.

If Laxmicoin does achieve the status of legal tender in India, it could lead the change in the way financial transactions are conducted in India.

5. Technology Stack

The underlying technology behind cryptocurrencies is Blockchain. A blockchain is a Distributed, Decentralized Transaction Ledger saved by each node in the network which is owned, maintained and updated by each node. Unlike a classic client-server architecture, blockchain consists of multiple nodes and is thus termed as Distributed Ledger Technology (DLT). A blockchain usually contains financial transactions and without the presence of any central authority managing the transaction flow. The core properties of blockchain is:

- Data is imitated across a number of sub systems in nearly real-time.
- Generally existing over a peer-to-peer network.
- For uniqueness, validity and implementation of transaction it relies on cryptography and digital signatures.
- It can be written by limited participants.
- A wider set of participants can read it.
- It works on a mechanism making it difficult to alter historical data, and it makes it easy to detect if someone is trying to modify historical data.

The mechanism of blockchain is as depicted in the figure below.

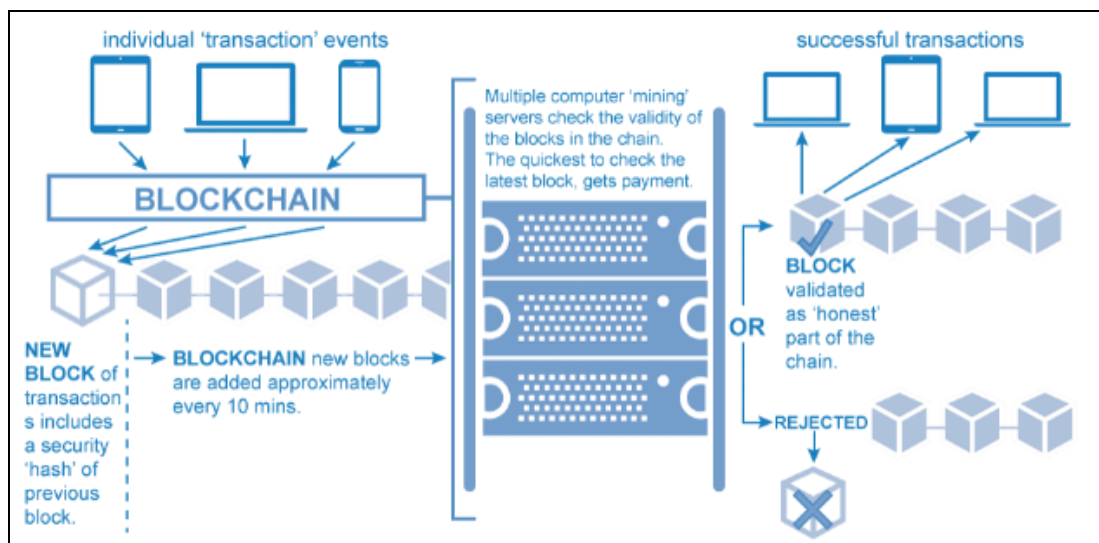


Fig 3

After bitcoin, the most popular blockchain network is of Ethereum, which is a platform for developers to build new tokens (cryptocurrencies) as well as write self-executing smart contracts that empower various use cases.

6. Future Scope

The crypto enthusiast are often found saying that Bitcoin - along with other cryptocurrencies - will replace paper money. Replace may be an extreme action here, but one cannot stand in total denial of its existence and impact. Cryptocurrencies are here to stay and they will soon withhold a dominance over other currencies, however they cannot replace paper money (fiat currency), at least not at this stage. Cryptocurrencies need not replace other currencies and it can still hold a better ground at performing various functions in the future. The

future scope of cryptocurrencies is as suggested below:

- Listing on Private / National Exchange: With over 125 cryptocurrency exchanges, and a total 24h volume of 800,651 BTC, cryptocurrencies are bound to step into national exchanges. Again, bitcoin is an earlier mover here and has been listed for futures trade on Cboe Global Markets Inc. and CME Group Inc. as of Dec. 17.
- Development of Ultra-Secure Wallets: The fact that cryptocurrencies are virtual money makes it is an easy target for hackers. Thus, security is a prime focus for all the major wallet players. Some of them have already adopted multi signature wallets that are capable of withstanding the heaviest of the attacks. More over the transaction size and speed is also affected by the current wallet's infrastructure. As a fundamental protocol upgrade,

SegWit is used, that decreases the virtual size of transactions and allows four times as many transactions to fit into a block.

- **Blockchain Powered Platform:** 80% of the cryptocurrencies qualify as utility tokens, i.e. these tokens will be used as a means to incentivize the users of their respective platform or to facilitate the execution of different functions. This directly indicates that we shall see a plethora of platforms that are powered by blockchain and have a stronger architectural and functional base.

7. Conclusion

Despite the discrepancy between independent blockchain network, the absence of regulatory compliance and the emerging security issues, Cryptocurrencies / Virtual Currencies / Digital currencies shall remain prevalent for a few more years. With the number of investors, the decentralized network is growing at a lightening pace. Governments and central banks must evaluate the potential impact of these and strategize a way to adopt these before it is tangled beyond adaptability. Cryptocurrency is predicted to be a Trillion-Dollar Market, and the world needs to prepare for this.

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