# Cryptocurrency : Invisible or Invincible Currency – Answers for Unanswered Questions

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## Abstract

**The study is a bird's eye view on various elements of virtual cryptocurrency that has been in existence from 2009 onwards. The information required for the study was collected from the media reports. In the first section of the paper, origin and features of bitcoin were discussed. In the next section, general risks and transactional risks with suitable examples and a few caselets were explained. Majority of the news content described that cryptocurrency does not carry the features of investment, and it is merely a form of speculation. The media reports indicated many fraudulent cryptocurrency transactions running into several lakhs because of hidden identity of people that opens the door for hacking money without much efforts. Unless the technology used to create cryptocurrency is transparent and regulated, it will not safeguard the money of investors getting trapped into it. The last part of the study indicated the international acceptance of cryptocurrency (both in developed and developing countries). It was found that majority of the countries did not encourage the use of bitcoins. Hence, this study would be of great use to the people who want to invest in cryptocurrencies.**

***Key words :*** **cryptocurrencies, Bitcoin, hacking, transactional risks, regulation**

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Cryptocurrency (Bitcoin - one of the prominent forms of cryptocurrency) became one of the trending topics at the end of the year 2017. This virtual currency, though it was introduced in the year 2009, became more attractive in the year 2017 because of the exponential increase in its price. The disadvantages of using bitcoins outweigh the advantages of it because there are a lot of risk factors such as lack of regulation, difficulties in tracing bitcoin users, lack of cyber security, and consumption of electrical energy, which would compel the investors/users to stay away from bitcoins. Also, the regulators (Finance Ministry and Reserve Bank of India) became keen in creating awareness in the form of warning bitcoin investors on its usage through the media.

In the month of April 2018, RBI barred all the banks in India from dealing with bitcoins and the bitcoin exchanges located in India were instructed to shut down. Against this backdrop, it becomes increasingly vital to know about the nuances of cryptocurrencies as against the currency of legal tender. There are a few studies, which have thrown light on the fundamentals of cryptocurrency. Bhattacharjee and Kaur (2015) discussed the evolution of Bitcoin as a currency, its effect on the present economy, transaction volumes, attitudes towards cryptocurrency, and related factors. An attempt is made by us in this study to bring out the positive and negative sides of bitcoins.

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## Cryptocurrency – Origin and Nature

The virtual currency was created in the year 2009 by the computer programmer Satoshi Nakamoto for the purpose of digital payments which do not form a part of the banking system. Cryptocurrency does not exist without a computer program. Cryptocurrency has no physical form like rupee. Also, the supply of the currency is not decided by the central bank of the country, meaning that it is decided by the users of the cryptocurrency system (Singh, 2018). A digital signature is involved when a bitcoin is transferred from one party to another (technically called as public - key, which secures from third parties).

↳ **Block Chain Technology :** The world "Block" refers to a set of transactions which are created by computer codes (cryptography) and those blocks are connected to form a chain, meaning that the transactions are arranged in a chronological order. In other words, block chain technology refers to a ledger which records/saves the events that occur in the cryptocurrency system automatically. This technology enables the buyer and seller to enter into transactions directly without the intervention of a third party administrator like a banker or a payment service provider. In this, information about the persons involved in the transactions are encrypted (Goyal, 2017).

The differences between fiat currency and cryptocurrency are given in the Table 1.

**Table 1. Difference Between Fiat Currency and Cryptocurrency**

| S.No. | Fiat Currency | Cryptocurrency |
|---|---|---|
| 1 | Central bank approved medium of exchange. | Not considered as approved medium of exchange by a Central bank. |
| 2 | Unit of account and a store of value. | It is neither a unit of account nor a store of value. |
| 3 | It is regulated by the Central government. | Cannot be regulated as it is a virtual currency. |
| 4 | It is easy to trace the identity of the buyer and seller of fiat currency with the help of a bank, especially in digital transactions and risk of frauds are very less. | It is difficult to trace the identity of the buyer and seller (owner) of bitcoins, and hence, the risk of frauds are high. |
| 5 | Value is stable. | Value is not stable because of high volatility. |
| 6 | Only one form of home currency is available in each country. | 1,500-odd cryptocurrencies are available in use. |
| 7 | The currencies are printed by the Central banks. | Anyone who knows block chain technology, computer algorithms along with hardware, Internet, and huge electric power supply can generate bitcoins. |

Source : Adapted from Singh (2018)

Shah (2018) clearly delineated the difference between physical currency and bitcoins. The author highlighted the risk of highest risk of price volatility of bitcoins.

## Features of Bitcoin

Das and Menon (2017) described about the features of bitcons which widely differ from physical currency. A bitcoin has the following features which makes it distinct from the physical currency :

**(1) Digitally Produced :** A Bitcoin is a form of cryptocurrency which is digitally produced and digitally circulated for use. Using this currency, any goods and services can be purchased. In USA, bitcoins are used for buying different products and services ranging from booking a flight ticket to ordering pizza.

**(2) Bitcoin Mining :** Bitcoin is similar to buying gold online (commodity that can be bought online). When the price of the gold appreciates, it can be sold out. Gold can be manufactured and can be seen in the real world ; whereas, bitcoin is created through the online mode. The process of creating bitcoins online is called as mining and the one who is doing it is called a miner. The cost incurred by miners for mining bitcoins is collected from the buyers of bitcoin. There is a separate system for mining activity as it consists of a lot of technical processes, which cannot be done by all.

**(3) Identifying Bitcoins :** A bitcoin is identified in the form of an alpha numeric code. This can be stored in e-wallets. The bitcoins can be bought through exchange platform which also provides wallet facility for the buyer. Hence, the documentation is also digital.

**(4) Availability of Units :** Bitcoins can also be bought in small units with a minimum amount of ₹ 1000. Rupee has smaller units in terms of paise. Similarly, bitcoins are available in terms of the value of the rupee divided into a maximum of two decimal places. But bitcoin can be divided into eight decimal places (000000001). The computer program is designed to create only 21 million bitcoins during the creation. The amount of bitcoins released will be reduced every 4 years. This means 12.5 bitcoins are offered to mining companies (ten minutes) for transactions.

**(5)** To operate in bitcoins, an individual should have the knowledge about the technical process in the system of generating them. If any of the steps in the process are not known, the subsequent step cannot be proceeded/tracked.

## Ways of Buying Bitcoins

Kumar (2017) described shortly about the means of getting bitcoins. The ways of buying bitcoins are listed here :

**(1)** The user willing to transact in bitcoins has to install a virtual wallet onto a personal computer or mobile device. This wallet helps in tracking bitcoin balances and all transactions.

**(2)** The real currency must either be transferred from a bank account or online payment gateways such as PayPal to an online third-party account interlinked to a website that connects bitcoin buyers and sellers.

**(3)** After the finds are made available in the account stated above, the buyer can place an order for bitcoin through the bitcoin exchanges.

**(4)** The bitcoins can also be purchased from third parties who can send the coins directly into the wallet of the buyer.

**(5)** Bitcoin can be received for goods and services provided.

**(6)** It can be generated through mining on own if the technical process and systems are known or can be done through experts.

## General Risks Associated with Investing in Virtual Currencies

Goyal (2016) stated that there are inbuilt risks associated with the investment in virtual currencies/ cryptocurrencies and are listed down below :

**(1) No Regulating Body :** The cryptocurrency market is not regulated by the Central bank of India, namely RBI.

As it is not regulated, the government can have no control on circulation of cryptocurrencies. Hence, this indicates that the virtual currencies do not have a legal tender in India, meaning that they are not treated on par with Indian currency. There is no apex body or a regulatory body for authorizing the setup of bitcoin/virtual currency exchanges, especially in India. Absence of regulation makes it difficult for bitcoin users to redress the grievances such as hacking of bitcoin wallet, unfair transaction charges, or any other loss due to bitcoin exchange or the dealer. India is known for regulating the financial and investment activities through various regulators such as RBI, SEBI, IRDA, and so on. These regulators are aimed at protecting the investors from fraud /criminal activities. On the other hand, there are a lot of security issues associated with cryptocurrencies because of the following reasons :

**(i)** There is no mechanism/process to address the grievances of customers/investors.

**(ii)** As it has no physical existence like any other currency, chances of hacking is more in its virtual form. Also, there is no system/procedure to handle customer/investor complaints in the event of failure of any nature during online/virtual transactions like any investment vehicle, one needs to exhibit caution and not be over ambitious with their investment in cryptocurrencies.

Oberoi (2018) stated that cryptocurrency is that which cannot be regulated by the government as it does not own it. It is similar to the Internet or email that can be accessed anywhere in the globe (as they are cloud based services). It is a well-known fact that the Internet or email cannot be controlled or regulated by the government, and the same situation applies to cryptocurrency and bitcoins.

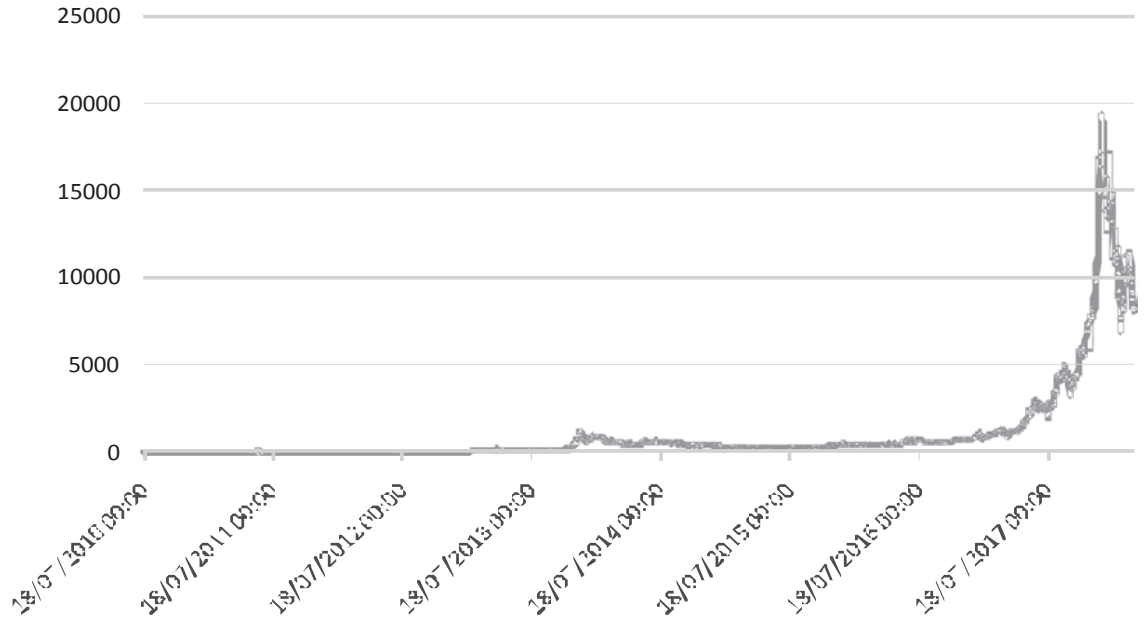
**(2) Price Volatility :** The price of cryptocurrencies are more volatile because of the various factors such as acceptance of virtual/cryptocurrency by people, various regulating authorities for currencies, and any other events that specifically affect it. This leads to great uncertainty about the prices of virtual currencies. The price of bitcoin on July 18, 2010 was $0.09 and it rose $8117.75 on March 16, 2018 (as per CoinDesk data). This indicates huge volatility (9019622% increase) in prices of bitcoins. The reason that can be attributed for this volatility is that there is no underlying factors which drive their prices. Its price is purely driven by speculation in numerous unregulated exchanges around the world. Lokeshwarri (2017) stated that the volume of trade in bitcoins is quite less because 50% of the bitcoins are held by less than 1000 people who hoard them for speculation purposes.

**Table 2. Comparison of Sensex Returns and Bitcoin Returns**

| Year | Sensex Returns% | Bitcoin Returns (%) |
|---|---|---|
| 2011 | -24.83 | 1473.00 |
| 2012 | 25.19 | 156.00 |
| 2013 | 8.12 | 5595.00 |
| 2014 | 30.08 | -59.00 |
| 2015 | -5.05 | 37.00 |
| 2016 | 1.78 | 121.00 |
| 2017 | 28.06 | 1289.00 |
| **Mean Returns** | **9.05** | **1230.29** |
| **Standard Deviation** | **20.27** | **2024.18** |

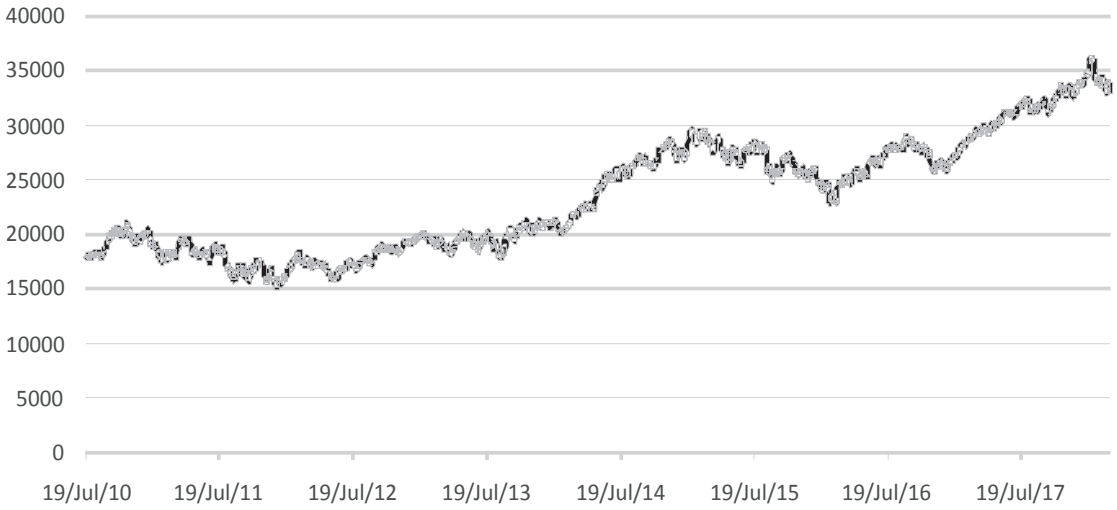
Source : Calculated based on data from BSE website and CoinDesk.com

**Figure 1. Price of Bitcoins from 2010 to 2017**




Note : The data for the above chart were extracted from CoinDesk (n.d.).

**Figure 2. SENSEX Movements from 2010 to 2017**




Note : The data for the above chart were extracted from BSE (n.d.).

The price of cryptocurrencies saw a very huge fluctuation right from 2009 to 2017. This indicates a very high-risk investment in bitcoins (shown in Table 2). There is no greater clue as to why there is a huge fluctuation in prices, which is evident from the higher standard deviation of bitcoin returns as shown in the Table 2. The reason is that there is no perfect information about the pricing system of cryptocurrencies, meaning that it is more of speculation rather than investment. As there is an exponential increase in prices, more people start to invest in bitcoins, leading to a big bubble which may eventually burst, thus creating losses. The fluctuation in price

movements of bitcoins and Sensex are shown in Figure 1 and Figure 2, respectively. The bitcoin prices were stable till the end of December 2017 and started to exponentially increase thereafter ; whereas, in the Sensex, on the other hand, fluctuation is comparatively much lesser.

**(3) Illegal Activity :** As the Indian government does not regulate cryptocurrencies, it is easy for the anti-social elements such as terrorists, hackers, and black money hoarders to make illegal transactions which cannot be traced as their addresses cannot be identified (Thanawala & Nathan, 2017). Also, the bitcoin computers can be attacked by malware virus which may ultimately lead to loss of huge amounts of money. Virtual currencies are neither physical currencies nor coins, though it is described as coins. These are also not legal tender. Hence, VCs are not currencies.

**(4) Investment in Bitcoins :** The share of a company is purchased by a few thousands and market price of the same increases or decreases depending on so many factors. On the other hand, bitcoin is used throughout the world and also, transactions happen in terms of multiple crores of transactions. Hence, it is difficult to influence the price of bitcoins by individuals. The feature of difficulty in tracking the holder of bitcoins, even after it is being sold to buyers, encourages considerable number of investors to invest huge in bitcoins.

## Transactional Risks Associated with Bitcoins

**(1) Hackers :** There are possibilities of hackers who may steal bitcoin account holder's account and it becomes difficult to trace the hacker and revert the transactions. Thus, it may lead to huge losses to the account holder.

**(i) Case of Japan :** A news item indicated Japanese cryptocurrency exchange called as 'Coincheck' was hacked to the extent of 58 billion yen (₹ 3500 crore) during January 2018 ("$530 million lost in hack of Japan cryptocurrency exchange," 2018) . The crypotcurrency hacked was called NEM.

**(ii) Fraudulent Activity in the Name of Bitcoins (A Real Case in India) :** This is an extract about how digital currencies pave the way for criminal activities that loot loads of money from investors ("Criminals find easy money in digital currency boom," 2018). This describes a real incident that happened in Pune, Maharashtra. The information is based upon the investigations (published in the *Times of India*) made by Mumbai Police Commissioner, Rashmi Shukla after receiving 25 complaint applications. About 8,000 people invested in different cryptocurrencies such as bitcoin and M-Cap through fraudulent companies floated by the Bharadwaj brothers and their five partners. In April 2014, GB21 (Gain Bitcoin) company was started by them in Singapore. In the subsequent year, a website www.gainbitcoin.com was started. Businessmen, net surfers, home makers, and doctors were their targets. With the help of this website, the suspects would attract investors by offering 180% returns within just 18 months for a minimum investment of 0.1 bitcoin.

They accepted investments in the form of online, cash, and cheques through their appointed agents who were paid bitcoins as commission. When the Bharadwaj brothers and the others found it difficult to give the promised returns to the investors, they floated a new company, M-Cap Phase-1 on April 27, 2016, and created a cryptocurrency called M-Cap, promising a return of 200% in 20 months with a minimum initial investment of US$100. In January 2017, the suspects floated another company, M-Cap Phase-II, which offered 200% returns in just 12 months on an initial investment of $100 in M-Caps. The suspects did not return bitcoins to the investors, as promised, but they gave M-Caps (name of cryptocurrency owned by suspects) which hardly had any value in the market. It was also found that the money collected from investors was distributed among Amit Bharadwaj's family members and partners.

**(iii) Bitcoin Wallet of a Delhi Resident Hacked :** Bhardwaj (2018) reported in *The Economic Times* about a bitcoin hacking that happened to a woman in Delhi. The information is based on the statements from the victim. A Delhi woman was hacked by unidentified people and lost around ₹ 41 lakhs. The woman claimed that there are more victims who might have lost around ₹ 50 crore. The woman had approached the economic offence wing with her complaint. The first time around, 6.5 bitcoins worth ₹ 6.5 lakhs were stolen by hackers and later ₹ 35 lakhs were stolen by cheats who promised her to get back the money lost during the first time. The cyber cell has begun a probe. She stated that she was introduced to the bitcoin investment by her friend. She firstly invested around 0.4 bitcoins with a company during February 2017. The firm had organized seminars in five-star hotels to lure investors. In May 2017, she again invested by taking the money out from mutual funds after its maturity as she got attracted by seminars organized by bitcoin firms. She invested all her savings in the company along with her friends and family members. The company owners promised her returns of 12% per month on her investment. She got the returns in her bank account till August 2017 after which it was stopped. This created a doubt in the minds of investors who demanded returns in Indian rupees. She also then asked the firm to return her invested money. In October 2017, the firm contacted her and got her registered email ID and password, saying that it is required to process her returns. On November 8, 2017, her blockchain wallet was hacked, which had 6.5 bitcoins. Four days after losing her bitcoins, she sought the help of acquaintances who promised to help in retrieving the lost money by showing listed websites like 'FXoptions.com,' 'Cryptominers.com,' 'coinspaceprofit.com,' and '24options.com.' to her. She believed the men and paid for the service. After receiving the amount, he stopped responding to her calls and other communications, saying that he has throat cancer and cannot communicate. Finally, the victim went to the police.

**(2) Lack of Real World Identity :** Neither transactions nor accounts are linked with the real world identities. The bitcoins are received in the form of 30 characters which are randomly generated addresses. Though the transaction flow can be analyzed, it is not possible to link the real identity of users with those addresses.

**(3) Speed of Transaction :** Transactions are initiated and get done at a faster rate in the network and are confirmed within two minutes, irrespective of location whether it is within the country or in any part in the globe.

**(4) Permission:** It does not require anyone's special permission to use cryptocurrency. It requires software (freely downloadable) for generating it. There is no other third party to act as a gatekeeper who monitors the transactions.

## International Attitude Towards Cryptocurrencies

PricewaterCoopers (2015) reported the level of acceptance of bitcoins in other countries and the contents of the same are discussed below.

Many countries have been blocking Bitcoins internationally. Even the UK, the U.S., and China, which did not initially care about bitcons, are now paying their attention towards the issues of bitcoin transactions. Countries such as Canada and Australia are not in a position to decide about Bitcoin. However, the countries which have not decided have banned the transactions of bitcoin and have declared it illegal. It is important to note that many countries do not recognize or support this currency. They have been prohibited. The reason is that if Bitcoin is legally recognized, the value of the currency of the respective countries will decrease and there is possibility of neglecting the fiat/physical currency transaction. The bitcoins have been banned by the states, central bank, or both in different countries.

### Countries Abandoning Cryptocurrency

Even those who initially believed in the exchange of bitcoins have abandoned them now. Bitcoins can give you whatever you want to buy - from the airline ticket to the first burger. But now, the rules are tightened. The World Bank fears about the problems/risks faced by holding bitcoins ; also, there is no clarity of how cryptocurrency works. In September 2017, China being the largest market for bitcoin transactions tightened the norms for bitcoins. In particular, it was ordered to close all the stock exchanges operating in China. The Chinese Central Bank began to investigate the individuals and entities who earned assets by way of transacting in bitcoins. Besides, it was declared illegal to add assets by way of bitcoins. This led to the decline of bitcoin market from December 2017 because 70% of the world's bitcoins produced in the world are from China.

South Korea is now one of the world's largest bitcoin markets. As China began to take action, South Korea made more of its payoff transactions (took this as an opportunity to deal with more bitcoin transactions) after Japan and the U.S. As a result of this, the South Korean government is now trying to control the electronic currency growth. In September 2017, South Korea banned cryptocurrency trade and announced that it was working on closing down bitcoin markets because the key stock market in South Korea was closed down due to cyber attacks.

**(1) Bangladesh :** In Bangladesh, Bitcoin has been banned because of its likely impact on its economy under the Monetary Control Act of 1947 and 2012. If any individual is involved in other illegal digital transactions, including bitcoins, they would get a 12-year jail term. The government announced that use of bitcoins for the payment of money, money laundering, and financing terrorism are strictly considered illegal. Last year (2017), it was also announced that it would set up a team to review the regulatory frameworks for using bitcoins.

**(2) Indonesia :** Indonesia has banned exchanges via cryptocurrencies. But the transactions and mining process to produce bitcoins are not yet prohibited. The Act came into effect on January 1, 2018.

**(3) Vietnam :** Vietnam has been insisting from 2017 onwards that it will create a legal process for cryptocurrency. But until now, it is illegal to use bitcoins in that country. If any bitcoin transaction is identified, a fine of upto $ 9,000 should be paid.

**(4) India :** In India, bitcoins have been declared illegal, but their transactions are not yet frozen. However, the Reserve Bank of India and the Central Government are warning about the problems associated with cryptocurrency. However, in comparison to other countries, restrictions on bitcoins in India are limited. The Reserve Bank of India (RBI) on March 05, 2018 barred individuals and business entities which are under the regulation of RBI from dealing with virtual currencies. This means that these entities should not facilitate buying and selling of cryptocurrencies. Besides, the restrictions imposed by USA and UK on the transactions of the cryptocurrencies led to the loss of its market value. A 2015 PwC consumer cryptocurrency survey conducted in the U.S. found that 83% of the respondents were not at all familiar with cryptocurrency, and 3% of the respondents had actually used cryptocurrencies within the previous year (PricewaterCoopers, 2015). When the World Bank itself is lacking clarity on cryptocurrencies, it is not surprising that the countries are abandoning them. The drive home point is that money is not safe by investing in these cryptocurrencies.

## Research Implications

The study is an attempt to know the conceptual and practical aspects of cryptocurrency. The data and information for the study were collected from the secondary sources, mainly from media and websites. The study will be of

great help to create a fundamental awareness about cryptocurrencies. The risks which are inherent as a part of bitcoin transactions will enable the investors to make well informed decisions. The study also clearly delineates the transactional risks, legal risks, and speculation risks related to bitcoins with a few caselets and secondary data evidences. The global perspectives on bitcoins also support that bitcoin transactions are illegal and prohibited by both developed and developing nations, though it was initially allowed for in some of the countries.

## Conclusion

The study is mainly focused on the various implications of emerging virtual currency. Any investment should have safety, fool proof transaction systems, transparency, integrity, legal enforcement features, and so on. Bitcoins have a lot of issues and doubts with reference to the features. It is evident from many cases published in the newspapers about the theft of bitcoin e-wallets that leads to huge monetary loss (millions and crores of money) to the users of bitcoins. Inspite of warning by RBI, the central bank of India, that cryptocurrencies are Ponzi schemes, many investors are getting trapped. The investment guru Warren Buffet has said that one should not be greedy in terms of investment and one should not wait for a long term to reap the benefits of investments. One can follow the ideas of successful investment gurus to avoid financial frauds and financial crises. India is known for savings and investments which are one of the major factors that drive economic growth. Anything that hinders and ruptures the stable financial system should be weeded out to sustain economic growth. So, one must think several thousand times before investing in cryptocurrencies.

## Limitations of the Study and Scope for Further Research

The data for the study were collected from the secondary sources which also includes opinions published in prominent newspapers. The research publications on bitcoins / cryptocurrencies are more technical in nature and only a very few studies are focused in terms of investment perspectives. The study would be a ready reference for those who want to pursue research in the areas of investment risk management, alternative forms of investments/currencies, technological implications on fraudulent activities, and so on. The study did not cover the pricing mechanism of bitcoins in depth. The study can be further extended by analyzing risk and returns of cryptocurrency with other legal forms of investments and hence, will be of great help in tracing market irregularities with special reference to bitcoins.

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