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A Comprehensive Study of Bitcoin in Modern Finance: A Theoretical Framework

The Cryptocurrency market has grown massively over the last decade, necessitating a greater emphasis on a study on different facets of Cryptocurrencies. Bitcoin, a most prominent Cryptocurrency relies on Blockchain technology. This new technology helps to prevent the double spending problem. The purpose of this study is twofold. The purpose of this study is twofold. First, this study makes a significant contribution to this area of research by examining Bitcoin's behavior. In addition, a narrative literature review method is employed to assess if Bitcoin may be classified as a regular currency or an asset. Second, it aids in understanding the opportunities and challenges of adopting Cryptocurrency, as a medium of exchange. The results show that Bitcoin can be used as a speculative investment instead of banknotes due to its high volatility and unregulated market. On the other hand, Bitcoin; offers low transaction costs, can be purchased in fractions, is safe and secure, and helps to prevent inflation while using as a payment gateway. This study helpful for academicians and economists in conducting future research.

Keywords: Cryptocurrency, Bitcoin, Blockchain technology, Assets, Fiat currencies, Legal- tender

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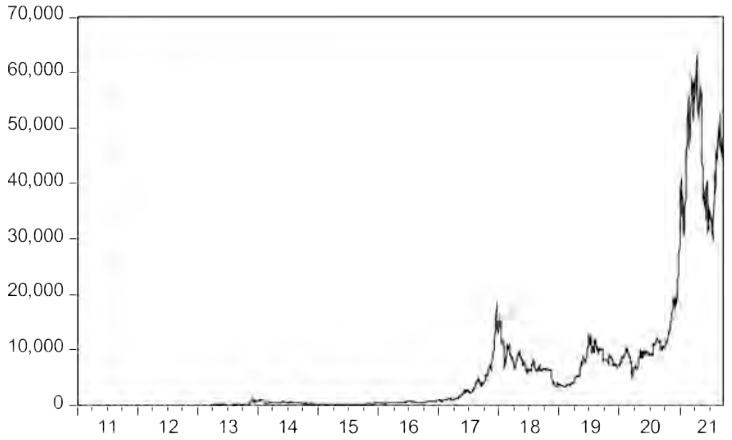
1. Introduction

In the modern era, Bitcoin has become the hottest topic among media, academics, policymakers, financial institutions and regulatory bodies as its price has soared in a concise period. There are two potential reasons for Bitcoin's popularity. First, their lucrative returns and speculative behaviour (Dhyberg, 2016) and second, it is a decentralized system (Grinberg, 2011). According to coinmarketcap.com, today, over 10,000 Cryptocurrencies available on the online platform, with Bitcoin being the most popular, having 66% market capitalization of the overall Cryptocurrency market cap in 2020. In 2008, the financial crisis of the economy relentlessly criticized legal currency monopolies, causing people to lose trust in banks and financial institutions. At that time, Bitcoin brought with it new technological waves. The evolution of Bitcoin began in 2008, and trading started in 2009. The purpose behind this technology was to reduce reliance on banks and the government; by putting the power in the hands of the people (Chapron, 2017; Bação *et al.,* 2018; Kolber, 2018; Sudzina, 2018; Kfir, 2020). However, the government; can reduce the value of money by printing a lot of paper currency, but in the case of Bitcoin, only 21 million Bitcoins will do the needful, amongst which 19 million Bitcoins have already been produced, to date. It contributes to reducing inflation. This innovation poses a significant challenge to traditional currencies (He, 2018). Figure 1 depicts the price movement of Bitcoin from 2011 to 2021. When it was launched, its market price was around $0.0001 in 2009, but after several years of financial turmoil, it crossed $68000 on November 8; 2021, with a market capitalization of $887,685,999,019, which was significantly higher than the market capitalization of most developing economic currencies. However, the market sank again on January 24; 2022, when the price of Bitcoin reached $35,000. The reason behind this significant collapse is the news that Russia's central bank projected to ban the use and mining of Cryptocurrencies earlier in the week. The whirlwind surrounding this news impacted its market; and caused a crash of more than 50% in a single day. It indicates that Bitcoin does not exhibit inherent worth, nor any government backing.

Figure 1- Bitcoin price movement (2011-2021)



Source- Author's computation

This study aims to determine whether Bitcoin can be classified as the same as other conventional currencies by applying the narrative literature review method. Furthermore, this study also addressing the challenges of legalization of Bitcoin in different countries; and also, to suggest Indian Government how they will adopt it in their tax bracket. In addition, this study explores the benefits and problems of using Bitcoin as a medium of exchange in daily life. Numerous studies have been conducted on Bitcoin and other Cryptocurrencies, their role in finance, and factors influencing crypto pricing (Kim *et al.,* 2016; Kristoufer, 2015). However, there is a dearth of scholarly insights that assess Cryptocurrencies' long-term existence, legalization process, as well as opportunities and challenges of Cryptocurrencies in modern financial systems.

The paper's final contribution is enumerated below- In section 2, we lighten the Tax structure of Cryptocurrency; In section 3, we focus on the relationship between Cryptocurrency; and conventional currencies and Cryptocurrency; and financial assets, In section 4; we get into detail on the opportunities and challenges of Cryptocurrencies from socioeconomic perspectives. Finally, sect. Five, we conclude with the findings and implications of the research agenda for the future.

2. Classification of Cryptocurrency under different economic policies-

On 17 December; 2014, the Australian taxation office announced that Bitcoin could not be classified as a banknote /foreign currency and a financial asset. In January 2018, the central bank of Canada U.S. Governor Stephen Poloz stated that Cryptocurrencies are not currency or assets. Whereas the Securities and Exchange Commission declared that Cryptocurrencies could be thought of as securities, while the Commodity Futures Trading Commission classified as a commodity. Whereas the International Revenue Services 2014, sec (2) defines Cryptocurrency; can be used as a mode of exchange/payment but is not recognized as a legal tender. Similarly; Rizzo and Zeldin (2014) found that Bitcoin can be used as a medium of exchange. The decentralized nature of Cryptocurrency; and trading through unregulated online platforms are the two primary reasons for such diverse views on the classification of Cryptocurrency; in the financial market. Since regulating and categorizing Cryptocurrencies are difficult. Although many countries have classified cryptocurrency based on their research/understanding to bring cryptocurrency into a tax bracket, as shown in Table 1, many countries, including India, Italy, and others, are still working on it.

Table 1 Tax Structure of Cryptocurrency

Country	Classification	Year of regulation	The tax structure of cryptocurrency
Australia	Property	2014	Capital gain tax, GST not applicable
Argentina	Private money, Things, or goods	2018	Income tax
Brazil	Financial Asset	2014	Capital gain tax and Income tax are applicable. capital gain tax lead if gain surpasses BRL35,000 in one month from the sale of virtual currencies
Chile	Foreign currency	2020	Income tax
Germany	Private money	2013	If virtual currency is owned for less than one year, then no capital gain tax is applicable. If owned for more than one year, then income tax is applicable up to 45% for all gains.

United States	Property	2014	Capital gains tax
United kingdom	Asset or Private money	2014	Corporations pay corporate tax, Unincorporated businesses pay Income tax and individuals pay capital gains tax
Japan	legal method payment	2017	Capital gain tax
Italy	Financial instrument	2017	Still not prepared
France	Moveable property	2014	Capital gain tax
Canada	A Commodity	2014	Capital gain tax
Estonia	An Investment and payment method	2014	Capital gain tax and VAT
Denmark	Investment property	2014	Capital gains tax
Singapore	Intangible property	Revised in Oct' 2020	Income tax
Sweden	Investment capital	---------	Income tax
Newzealand	Property	2020	Income tax
Venezuela	Financial asset	2017	Income tax

Source: Law Library of Congress, Regulatory Approaches to Cryptoassets in Selected Jurisdictions (Apr. 2019), https://perma.cc/DW4V-C52E.

<https://cryptoresearch.report/crypto-research/taxation-cryptocurrencies-europe/>; <https://www.log.gov>, 2014; <https://www.canada.ca>, 2014.

3. Cryptocurrency: A Currency or an Asset

3.1 Is Cryptocurrency a currency?

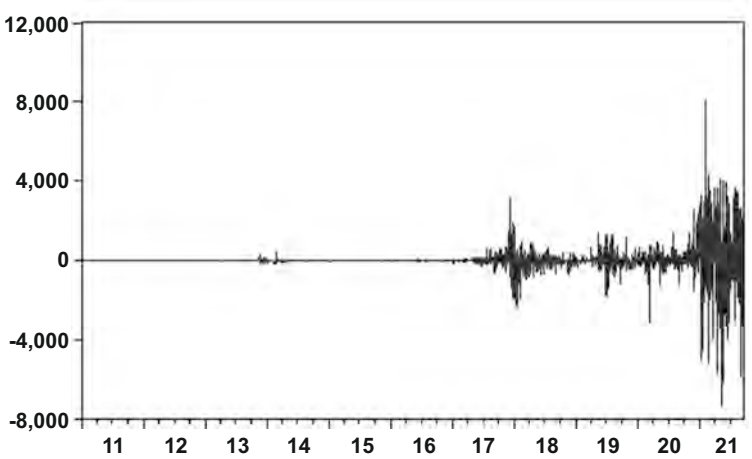
There is an ongoing discussion in the public media and among academic researchers about whether Bitcoin can be used as an alternative to traditional currencies. To lighten this question, we observed contradictory opinions in previous studies to confirm whether Bitcoin meets the standard features of a currency, namely, a medium of exchange, a unit of account, and a store of value. One school of thought contends that Bitcoin does not act like a standard currency. It is more akin to speculative investments due to its highly volatile and risky behaviour, which negatively affects its store of value property (e.g. Baur *et al.*, 2018; Bjerg, 2016; Dhyberg, 2016; Hanley, 2014; Velde, 2013; Williams, 2014; Yermack, 2014). Other; researchers, on the other hand, emphasize Bitcoin's

positive characteristics and see it as a global digital currency with considerable prospects (Luther and White, 2014; Folkinshteyn *et al.,* 2015; Plassaras, 2013; Satran, 2013).

To shed light on this question of whether Bitcoin can be used as a global currency or not, according to Mankiw (2007), Bitcoin or other Cryptocurrencies must fulfil the three fundamental properties (medium of exchange, unit of account, and store of value) of currency to be called a currency:

1. Bitcoin does not act as a medium of exchange and store of value property due to its highly volatile behaviour and unregulated market, which negates its probability of qualifying for the "store of value" parameter of traditional currency because its value can fluctuate dramatically overnight. According, to Mark T. Williams on, September 30; 2014, the volatility of the daily closing price of Bitcoin was seven times higher than commodity stocks like gold, eight times higher than stock indices (S&P 500), and 18 times higher than the U.S. dollar. Due to this Bitcoin is not stable for purchasing power. Figure 2 depicts the turbulent behaviour of Bitcoin return from 2011 to 2022, and it is evident from the figure that Bitcoin volatility frequently exceeds its mean reversion. As a result of its highly volatile behaviour, Bitcoin lacks such a store of value property.

Figure 2- Volatility of Bitcoin price (2011-2021)



Source - Author's computation

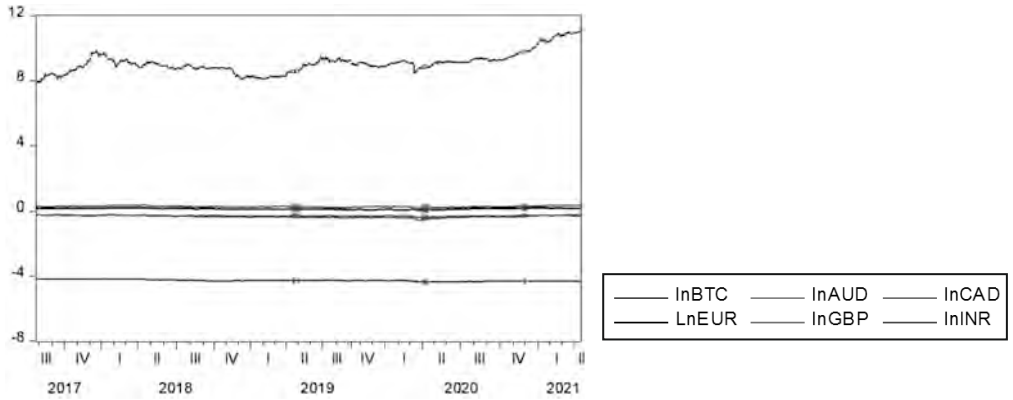
2. The second main reason Bitcoin cannot be called a currency is that it has no unit of account property to measure a real economic value of an item, good, or service to trade and consume because; it has no value of its own due to its speculative behaviour. For example, an apple might be said to be worth Rs. 20. The value of a component is always considered in the context of fiat currency not in virtual currency. Instead, Bitcoin can be used as an intermediary between the component and the fiat currency it is being exchanged. Sometimes, the phrase unit of account in the form of traditional currencies is quite unstable due to economic uncertainties like inflation, deflation, etc. As, a result, money is not always regarded as a good unit of account because its ability to measure the value of things varies. Despite these economic uncertainties, traditional currencies have intrinsic value.

3. To illustrate further, consider India's demonetization in 2016. The Government of India; had prohibited using Rs. 500 and Rs. 1000 old currency notes as legal tender to curb the black money and will provide new currency notes in place of old currency notes. It demonstrates that the currency has its worth and backing, but in the case of Bitcoin, it could not be seen due to its decentralized and unregulated market behaviour. For example, if the Government or any other regulatory bodies strictly prohibit trading or mining on cryptocurrency, or if some technical problem occurs that causes investors to lose their Bitcoin, on that condition, the Government or any other institutions are not liable.

There are various studies have been conducted on the volatility of the Cryptocurrency market in depth, where the researcher observed that the Bitcoin price volatility is greater than the global currencies (Agosto and Cafferata, 2020; Baur and Hoang, 2020; Brière *et al.,* 2015; Giudici and Pagnottoni, 2021; Selmi *et al.,* 2018; Symitsi and Chalvatzis, 2019). Similarly, Yermark (2013) observed that there is no correlation between the daily closing price of Bitcoin the conventional currencies like the British pound, Swiss franc, euro, yen, and gold against of the U.S. dollar exchange rate. Baur *et al* (2018) have found no association between Bitcoin returns and other marketable securities. Figure 3 shows a comparative study of the price movement of Bitcoin's daily closing prices from July 26;

2017, to April 16; 2021, with the most notable fiat currencies (Australian dollar (AUD), Canadian dollar (CAD), Pound sterling (GBP), Euro (EUR), and Indian rupee) (INR). Figure 3, demonstrate that all fiat currencies (AUD, CAD, GBP, EUR, and INR) are moving in the same direction. However, Bitcoin behaves differently and has higher volatility when compared to fiat currencies. So, it would be a falsehood to say that Bitcoin behaves like a currency.

Figure-3 Comparative study between price movement of Bitcoin and fiat currencies



Source- Author's computation

3.2 Is Cryptocurrency an Asset?

An asset has monetary advantages and future repayment. Cash flow or utility is used to determine the fundamental value of an asset. Stock, like a share, is an intangible asset with a fundamental value that can provide dividends and can be obtained at a discount or premium. Tangible asset, such as land or a commodity, has a fundamental value that can appreciate or depreciate per the prevailing market condition. There is another category of asset which is called "Speculative Asset". Speculative asset can be defined as a tangible or intangible asset that is being traded for very short-term profits or losses. Such assets may or may not have fundamental value, and traders usually do not require physical delivery of the asset. The speculative trader does not concern about the fundamental value. They trade the script for short-term profit/loss, such as derivative trading.

Cryptocurrencies' fundamental value is unclear due to their highly volatile behaviour. Its volatility is merely based on demand and supply. Dyhrberg (2016) observed that cryptocurrency could not be treated as currency or commodity; however, it can be considered a speculative asset because of its highly volatile nature. Brière *et al* (2015), on the other hand, confirmed that BTC is weakly linked to other traditional assets due to its hazardous behaviour. Furthermore, Bouri *et al* (2017) confirmed that Bitcoin strongly correaltes with other traditional assets, such as gold. Table 2 shows the correlation matrix between the daily closing prices of Bitcoin with fiat currencies (AUD, CAD, EUR, GBP, and INR), Stock indices (S&P 500 and Nifty 50), and Commodities (Gold and crude oil) from the period July 26; 2017, to April 16; 2021. Finding shows that Bitcoin has only a strong positive relationship with S&P 500 index. Figure 4 and Figure 5 shows a brief explanation of this relationship. Figure 4 shows the relationship between Bitcoin and fiat currencies, as well as the relationship among fiat currencies. Figure 5 demonstrates the relationship between Bitcoin and financial assets, as well as the relationship among financial assets. Figure 4 and Figure 5 represents that all the fiat currencies have a direct or indirect relationship with one another because of their similar geographical, political, and economic locations and exchanges. However, no link has been found between Bitcoin and Fiat currencies. On the other hand, Bitcoin has strongly association with S&P 500 index and a moderate association with gold. It suggests, when there is a positive vibe in the U.S. market, investor prefers to invest in Bitcoin to earn more profit. However, when it comes to gold, investors prefer to invest large volumes in gold during the stress period. It implies, when the financial market falls, investors seek out safe assets to hedge their risk. Historically, gold is the best hedge instrument, because of this many authors believe gold is the ideal tool for hedging. Overall Bitcoin has no link with any of the fiat currencies and stocks except S&P 500 due to its unregulated market and high volatility. As a result, we should classify Bitcoin as a speculative asset rather than currency or an asset.

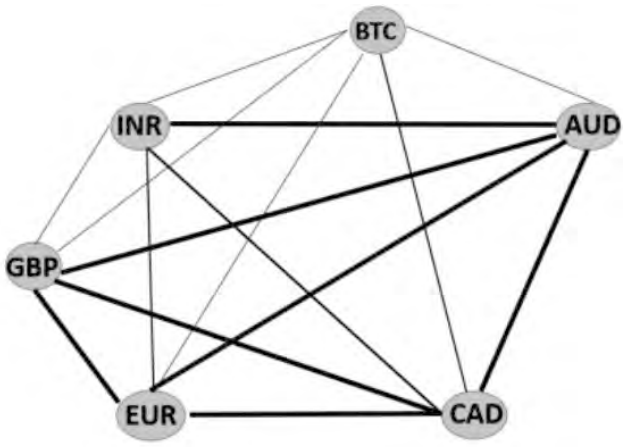
Table 2- Correlation matrix

	LNBTC	LNAUD	LNCAD	LNEUR	LNGBP	LNINR	LNS & P500	LNF	LNGOLD	LNCR UDE-Oil
LNBTC	1	0.192	0.264	0.362	0.372	-0.297	0.812964	0.568	0.6229	0.018
LNAUD	0.1922	1	0.899	0.874	0.79	0.653	-0.02148	0.548	-0.235	0.53
LNCAD	0.264	0.899	1	0.756	0.752	0.636	0.061807	0.638	-0.207	0.586
LNEUR	0.3615	0.874	0.756	1	0.822	0.437	0.126139	0.458	0.0248	0.347
LNGBP	0.3717	0.79	0.752	0.822	1	0.45	0.203586	0.616	-0.073	0.512
LNINR	-0.2968	0.653	0.636	0.437	0.45	1	-0.59293	0.212	-0.671	0.508
LNS & P500	0.813	-0.021	0.062	0.126	0.204	-0.593	1	0.562	0.78	-0.06
LNNSE	0.5678	0.548	0.638	0.458	0.616	0.212	0.561529	1	0.085	0.593
LNGOLD	0.6229	-0.235	-0.21	0.025	-0.073	-0.671	0.780008	0.085	1	-0.56
LNCO	0.018	0.53	0.586	0.347	0.512	0.508	-0.05541	0.593	-0.564	1

Source- Author's computation

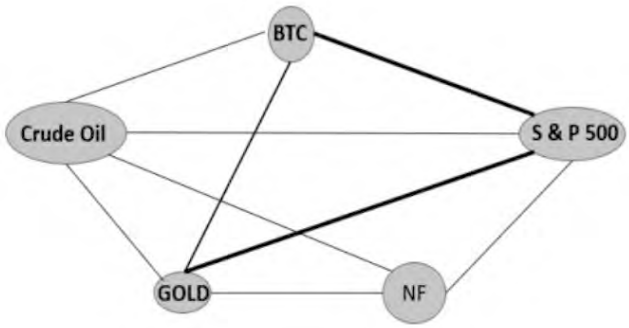
Where BTC, AUD, CAD, EUR, GBP, INR, and NF represent prices of Bitcoin, Australian Dollar, Canadian Dollar, Euro, Pound sterling, Indian rupee and Nifty 50

Figure-4 shows the relationship between Bitcoin and Fiat currencies.



Source- Author's computation

Figure-5 shows the relationship between Bitcoin and Financial assets.



Source- Author's computation

4. Opportunities and Challenges of Cryptocurrencies

As we all know, every coin has two aspects, positive as well as negative same as Bitcoin also. It has a plethora of advantages and disadvantages too, On the positive side, it is based on peer-to-peer networks and a decentralized mechanism; as a result, transaction fees are deficient in Bitcoin trading platforms, which is suitable for market participants as well developing economies from which they can develop their relationships within other nations. Furthermore, the Bitcoin protocol is based on a public ledger and Blockchain technology; public ledger makes it simple to view all transactions, including token inflow and outflow, from the beginning to the end of the transaction by every buyer and seller. In addition, Bohme *et al* (2015) observed that the storage of Bitcoin transaction data could be viewed across a computer network rather than on a single server. It improves data transparency. Bitcoin relies on Blockchain technology, which stores data in blocks and connects each block to a previous block via a cryptographic chain, making it impossible to manipulate any data. The consensus mechanism confirms and acknowledges all financial transactions within blocks, guaranteeing that every transaction is accurate and factual. Blockchain technology provides decentralization by allowing people to interact across various locations. So, it increases security, safety, and trust. Due; to these features, the researcher considered Bitcoin to be good to use as a standard currency, even though they suggest that the features of Bitcoin are better than the standard currency. According to Folkinshtein *et al* (2015), Bitcoin is not available in

physical form, it saves the printing cost incurred in printing the standard currency, and it also helps to reduce the cost of transportation and warehousing expenses and handling costs. Similarly, the payment mechanism of Bitcoin is more effective, quick, and more accessible than the conventional payment system at a low cost.

Furthermore, Bitcoin has infinite divisibility; today, the price of one Bitcoin is around $50000, which is a considerable amount for retail investors; however, due to its divisibility, retail investors or any other market participants can buy it in fractions with a maximum of eight decimals (0.000000001). This, small unit is known as a Satoshi. This distinguishing feature draws an increasing number of people to it. On the other hand, nowadays, large corporate firms accept Bitcoin as a payment gateway to buy online products and services due to its acceptability as a payment token. It can be used as a medium of exchange (Huang *et al.,* 2018; Inci & Lagasse, 2019). Bitcoin can used to raise funds through an initial coin offering (ICO) that relies on smart contracts ERC-20 tokens (Mukhopadhyay, 2018). The initial coin offering is a new phenomenon of finance and technology. Investors, receive cryptocurrency in exchange for their monetary assistance. Now a day, Bitcoin and Ethereum are becoming widely accepted Cryptocurrencies in ICO form. The fundamental advantage of ICOs is that no third party is involved in the funding process. It creates a direct link between investors and businesses. However, because the markets for these classes are less regulated than traditional capital markets, it also entails the risk of fraud and deception.

Despite these benefits, there are numerous impediments to calling a Cryptocurrency a standard currency because it is only available on online platforms. As a result, cyber security issues arise, a significant concern (Bo¨hme *et al.,* 2015; Yermack, 2014). In addition, it is based on peer-to-peer networks, which signifies no contribution or involvement of any third parties, making it difficult to prove it as a legal tender.

On the other hand, cryptocurrency is not immune to fraud, scandals, and illegal activity, such as Silk Road, the 2013 hack of Mt.GOX, Faze saga scam (2021), the Squid coin scam (2021), Poly network hack scam (2021), and Afriscrypt scam (2021). Böhme *et al* (2015) observed that when Bitcoin was introduced, on that time the majority of transactions were executed for drug purchases, and 46% of overall transactions were related to illegal deeds. In 2019; illegal activities accounted for 2.1% of total transaction

volume (approximately $21.4 billion). However, by 2020, this value had dropped to 0.34% from 2.1% (chainanalysis.com). Table 3; provides a brief outline of the potential and obstacles that investors face when using cryptocurrency as a medium of exchange and in their daily lives.

Table – 3 Opportunities and Challenges of Cryptocurrency in modern finance

Opportunities	Challenges
Transparency	Available only in online mode, there is no physical mode available
Security and safety	Legal and regulatory issues
Decentralized	It can be used in criminal activities
High speed of transaction	Irreversible process
Low transaction cost	High volatility and high risk
Divisibility (buy up to 8 decimals)	Unregulated market
Freedom of transaction to an unlimited amount	High energy and environmental cost

Source- Author's computation

5. Conclusion

In this study, we used past literature and money theory to analyze the behaviour of Bitcoin and whether it can be classified as a traditional currency or not. In addition, it investigate the benefits and challenges of Bitcoin while used as a medium of exchange. Based on past research, the findings show that Bitcoin cannot be classified as a traditional currency due to its extreme volatility, unregulated market, and regulatory difficulties. We discovered that the series of notable fiat currencies (AUD, CAD, EUR, GBP, and INR) have some direct or indirect relationship with one another due to their common geographical, economic, and political location and exchanges. After using a correlation matrix and volatility chart of all the variables. Due to its explosive behaviour, Bitcoin has no relationship with fiat currencies. The price of Bitcoin moves independently and its value derives from supply and demand.

There are numerous advantages to using Bitcoins as a medium of exchange, including minimal transaction fees, a decentralized process, security, high transaction speed, and divisibility. It also aids in the advancement of new technology and the formation of new start-ups. This new technology can provide opportunities for new market players and small enterprises by expediting the fundraising procedure via the ICO process without the assistance of any third party, like financial institutions, intermediaries, etc. Despite these advantages, there are numerous challenges to calling Bitcoin a currency, and difficult to use as a medium of exchange in daily lives because there may be no regulatory recourse for any loss from such transactions.

Considering the study's findings, the Government of India, Investors, and financial institutions could be suggested to consider Bitcoin or other Cryptocurrencies as a "speculative asset" rather than banknotes but to the lack of regulation and accountability. It could also be suggested to the Indian Government that whatever Cryptocurrency exchanges are there; they should be centralized. Every individual's KYC form should be filled in so that the complete details of every person's transaction can be known from where the cash inflow or outflow is happening, as well as linking every KYC with the bank so that every transaction can be figured out, which may reduce the uses of cryptocurrency for illegal transactions.

Although the purpose of this study is to investigate the properties of Bitcoin and other cryptocurrencies and the advantages and disadvantages of using Cryptocurrencies in daily life. We affirm that it opens the door to the youth of new think-track and substances that will be utilitarian to researchers and academics to put money into the cryptocurrency market. Further, it may transpose and become too different from what is around us today. However, cryptocurrencies already epitomize a revolution capable of turning our financial markets and economies' progress in terms of usability and development. Hence, future studies may provide more insights by thoroughly exploring various research directions.

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