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Prevalence of Crypto-currencies: A Critical Review of Their Functioning and Impact on Indian Economy

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Abstract

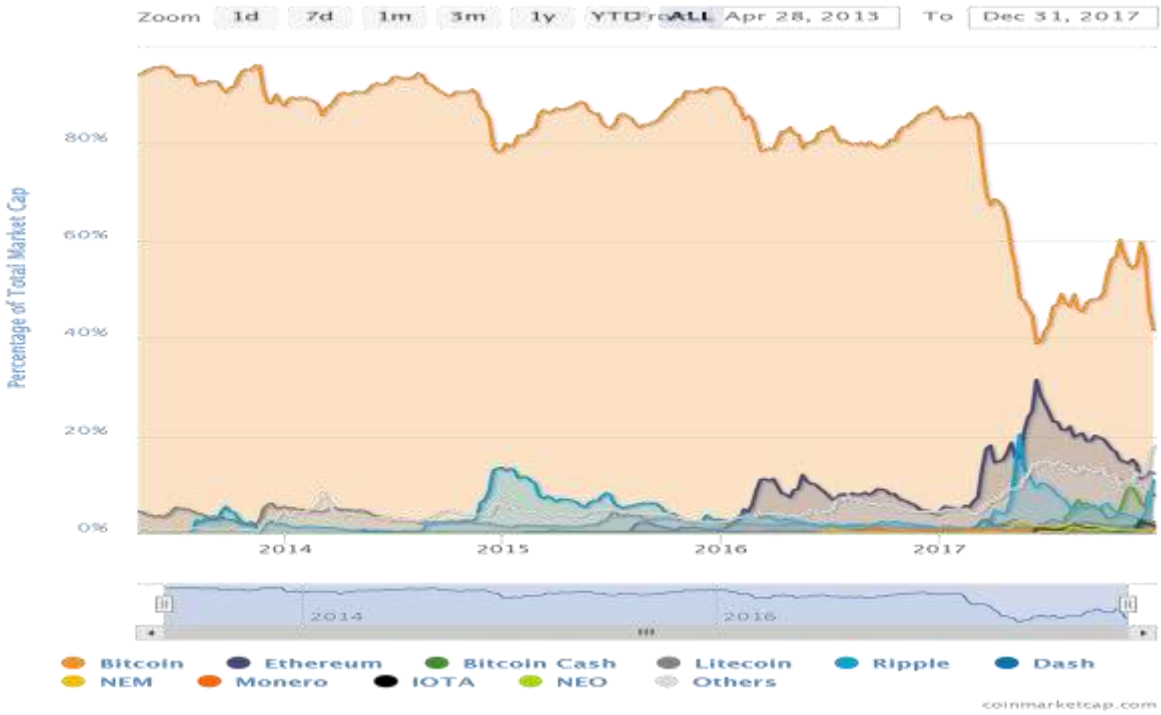
The virtual currencies or cryptocurrencies are growing rapidly in developed economies like UK, USA, and Japan. The motives of these currencies to create an efficient method of digital payment system which is globally accepted and their traders' belief that these coins have some value, either a physical value or have a money value in terms of their native currency. The first cryptocurrency, Bitcoin (BTC) is facing competition today with newly launched 'Altcoins' or 'Alternative coins", like Ripple (XRP), Ethereum (ETH) etc., the market captured (market cap) by BTC is continuously decreasing and ranging between 30 to 35% of the total market cap. The newly launched 'Altcoins' are technically efficient and have an audience with different motives compare to BTC, also these coins have a huge potential of growth level within a time compare to BTC, Because BTC prices are very high and its growth level is low compares with newly genesis coins. This article deals some important aspects of cryptocurrency worldwide with an addition to explore its role in the Indian Economy because India is not apart from this emerging trend. Many Indian trading exchanges are started within last few years, rather Government of India is not in favor of crypto trading. The aim of this article to critically examine working features of cryptocurrencies, eg; Mining, how crypto Initial Coin Offerings (ICOs) are working, their exchange markets, and how this peer-to-peer (P2P) currency blockchain works. This article also critically evaluate Indian crypto traders' motives and try to find out a way to deal with the related issues of cryptocurrencies for Indian Economy.

Keywords: *Cryptocurrency, Bitcoin (BTC), Altcoin, Crypto Exchange, Mining, Initial Coin Offering (ICO), Blockchain, Peer-to-Peer (P2P)*

Introduction

The essential nature of e-payment or digital payment system has an institutional control, but today the global economy moving towards a drastic change created by cryptocurrencies which decentralized the institutional role or the role of monetary policy on money supply in the economy. After 2009 when the first cryptocurrency 'Bitcoin' (BTC), was fashioned by anonymous creator or pseudonym of a cryptographer named "Satoshi Nakamoto", the global scenario of the crypto world today is not limited with only one currency BTC, rather there are more than 1448 cryptocurrencies are in circulation via more than 7642 crypto exchange markets (Coinmarketcap report, December 2017). The first cryptocurrency BTC has captured 35% of all crypto market globally while rest market captured by other cryptocurrencies or "Altcoins", which comprises 'Alternative' and 'Coin', and we called them in short "Altcoins". These are those coins which are in the crypto market came after Bitcoin and people are also trading in Altcoins also, along with BTC. Today apart from BTC, two major Altcoins, Ethereum and Ripple captured 30% of the cryptocurrency market, rest of more than 28% of market captured by other remaining Altcoins (CoinGecko year review 2017).

Percentage of total market cap of Bitcoin and top Altcoins (April 28, 2013, to December 31, 2017)



Source: coinmarketcap.com

Many noticeable scholars traced several relationships between BTC and other Altcoins future prices, this price relationship is not static or purely dynamic rather it differs with time due to unexpected caused involve regarding their price change. The dynamic relationship between these digital currencies is tandem for certain period of time, while in some other cases they move in opposite direction in terms of prices or with a very low level of correlation between these coins. The price relationship of BTC and Ripple (XRP) differs, their price correlation is very low for certain period or sometimes seems totally opposite, and the reason of this might be related to the

targeted audience of these two currencies. Apart from this, if we see the price relationship between BTC and Ethereum (ETH) has a trend of some moderate correlation, and for certain period of time, this correlation seems to be very high, up to 0.98 coefficient level (Coindesk, 2017).

From the emergence of the cryptocurrencies, if we see the current situation of their market, one can't say BTC or some important Altcoins has the only capacity to build trust over the audience, because today the genesis of new crypto coins can capture the efficient level of market cap within few months by their transaction facility convenience, and they sound technologically rich compare to conventional cryptocurrencies. Most of the Altcoins are emerging from developing nations by those ICOs channels which already proved their dominance, but these trending or emergence of crypto coins have several pros and cons, which is very important to understand for traders. Countries like India, where digital payment system is still in creeping mode and the interest of investors in cryptocurrencies growing rapidly. However, three major warnings are already issued by Central Bank of India (RBI) regarding crypto, but somehow India is not separated from this new era of the peer-to-peer trading system, the share of Indian crypto traders is about 3 to 5% (CoinDesk.com) in the total market circulation of cryptocurrencies. The first Indian coin "Lakshmi Coin" was set to launch in 2013 but the government refused the proposal of its owner because of its risk and uncontrolled behaviors of speculation which can create threats for the economic conditions.

Recently the Reliance CEO has expressed that he is planning to launch the first Indian cryptocurrency "JioCoin' soon. The enthusiasm of crypto traders in the world as well as in India are somehow challenging the government view, the joint group of some crypto exchanges has created Digital Asset and Blockchain Foundation of India (DABFI), it is a foundation for providing awareness about cryptocurrencies to the people, it also works as a consultant for industries as well as for stakeholders. Cryptocurrencies are functionally considered illegal for India (CoinGecko report 2017), but somehow they are still circulating in economy, the first warning notified by RBI on 24 December 2013, that investment in virtual currencies or cryptocurrencies are highly risky even their trading are not authorised by any monetary institutions, this first warning has already notified the security risk of wallets, hacking, trading exchanges can be used as medium for terror funding, and money laundering. After 2013, several more warnings have aired by RBI and recently by Indian finance minister stated that crypto trading is like Ponzi scheme. Despite these warning, there are more than 15 Indian cryptocurrencies exchanges are running their startups with their own KYC account verification process for an account creator. In India, an 18 years old person can do trade by these exchanges after a formal KYC signup process which requires "Aadhar Card", "Pan Card' and "Bank Account detail". In the last week of December, the income tax department had done a survey of these exchanges (as cleared by the Indian exchanges) for the details of all crypto trade account holders of these exchanges.

It is worth noting that India's cybersecurity is unsecured and institutional wallets have more or less State supports, for example, the Indian Government is already in favour of digital payment systems and introduced several digital payment wallets for people, but crypto digital payments are not allowed by any e-commerce market of local market due to its decentralization and volatility. The integrity of crypto coins is secured by itself or by their networks which can't be tempered by any hacker at a time, if someone wants to do so definitely he has to be faster than the global network of all miners to steal any crypto coin but threats can be done from other paths of these peer networks.

Literature Survey

Giaglis et al. (2014), evaluated the information system role in virtual currencies world, they have highlighted that; research works are diverse from the role of an information system on Bitcoin trading, generally, the potential of an information system for crypto trading such as BTC has neglected by the scholars.

Turpin (2014), critically examined the virtual currency state for economy, the high risk of fraud related to crypto currencies creates problem for a trader to trust a currency such as BTC, but before making any statement for crypto by institutional authority, they should think about its potential features and related methods by which these all threats can be minimize, further he stated that the interest of people regarding this crypto world is growing fast and before law-abiding for a citizen, government should think, how it can be managed in a better way. He has suggested the wisest way to control BTC by any government by regulating the transaction rather controlling the network.

Beate Sauer (2016) has narrated that virtual currencies or Bitcoins are in vogue because of decentralized nature and they are away from deficits which occur due to political instability in an economy. He further evaluated that how virtual currencies may be incorporated into monetary policy using the Keynesian monetary supply theory, he also pointed out various pros and cons related to cryptocurrency.

Chatterjee et al. (2017), evaluated the state of art of Bitcoin technology with different type of electronic e-payments systems, they further argue that Bitcoin technology is still in dilemma for us, we can't say it is fair or not for transfer and trading, however this situation of dilemma can be understood on the basis of market situations where faith and beliefs of investors create a huge role to determine its value for future. The prediction of BTC value by any theoretical approach is still impossible to handle and ahead from the framework of any theory which can capture the whole situation well.

Cocco et al. (2017), has used an artificial financial cryptocurrency market situation to study to heterogeneous nature of crypto traders. They have pointed out two types of heterogeneous agents; namely the Random traders and the Chartists. Random traders are those traders who are not involved in crypto trading for speculation motives while Chartists are involved for speculation motives. On the basis of these two agents who are involved in crypto trading, they have studied the functioning process of single cryptocurrency Bitcoin (BTC) only and tried to find out the specific behavior of traders.

Functioning of Crypto Currencies:

The process of cryptocurrency trade actually works through peer to peer network of these coins without the involvement of any financial body. People believe that the cryptocurrencies are worth for physical value or currency circulated by authority/institution. It shows that people group belief over a cryptocurrency plays an important role in the transaction as well as for its future value return. A cryptocurrency is a digital encrypted currency which is mathematically created via cryptography that provides a value for exchange between buyers and sellers, these currencies are highly secure between peer-to-peer (P2P) networks. The transfer of coins records unique codes between two peers and their value can't be manipulated by anyone further, because the codes of transfers between these two are unique for each transaction and

miners encrypted those codes with a unique hash, and finally the transfer between peers or buyers and sellers are confirmed by ledgers in a public domain.

The Mining:

The confirmation of a transaction is done by miners and this process is called mining of the currencies, quite simply mining process records each transaction and put it in a public ledger. Once after mining is confirmed and transaction recorded in public ledger, no one can change the value of that transaction further. In the process of mining, the miner must have to solve a mathematical puzzle or we can generally say that it is like unifying a transaction which needs a mathematical skill. In the beginning of first crypto (BTC), mining was very hard and time taking process, solely dependent over a single miner for each transaction and these all take almost 10 to 12 days to confirm a transaction between two parties or traders, and miner had been given some amount of those transactions. However today, mining is different, it works via a group of miners and incentive amount of each mining shared between them after completion of a transaction, group mining has reduced the timing of transaction confirmation and it takes about 6 min to confirm a BTC transaction. In the case of some Altcoins, mining timing differs, for example; Ripple (XRP) mining time is very fast and it takes about 4 to 6 seconds to confirm a transaction.

The Ledgers:

We can call it transaction maintainer who clear all the transaction and secured them for the public market. They also provide securities for wallets in which a trader keeps his crypto coins. Developing securities and infrastructure, providing blockchain solutions for individual and also for a company is the main function of a ledger. The recent development for user security at trading exchange 2FA authentication is the very useful invention of the ledger, the 2FA security level provides a user infrastructure that enables level for security for login and transaction confirmation, for deposit and withdrawal both. The belief of a crypto holder is positively correlated with currency ledger performance (Coindesk, 2017).

Role of ICOs:

Initial Coin Offering (ICO) or Initial Public Coin offering (IPCO) works as a medium of crowdfunding for new cryptocurrency venture who wants to launch a coin in the market. from an initial coin offering period generally, a coin raised funding from the public within a week or in few months. If a startup wants to raise money by ICOs, it has to create a white paper in which the all agenda of the startup company should be clearly mentioned with a targeted unit of the coin within a certain period. The initial coin offering period predetermines the price that coin and it can't be changed during the offering period. Once an ICO startup becomes successful in raising money then the available circulated currency or that coin which was launched and the total supply of target within a time play a big role to determine the coin price in the future. It is also important to note here, in past few year small ICOs has done potentially very well compare to major coin offerings, and this might be the reason of Altcoins market dominance is increasing fast by small ICOs projects. In November 2013 the total volume raised by all ICOs was about $38.6 million, and in December 2017 it was approx. $3800 million, it seems that more funds have recorded within 2015-2017. This ICOs success rate also clearly states the public belief in cryptocurrencies has been increasing globally.

Role of Crypto Trading Exchanges:

A major role in this digital form of trading is played by exchange markets of these coins. There are many trade platforms available for everyone across the world where they can easily buy and sell cryptocurrencies, some of these exchanges have their own verification of account levels, like general account, verified account, premium account etc., and these levels define the withdrawal limit per day for a user. Likewise in India, after many warnings have already been issued from RBI since 2013 then all Indian crypto trading exchanges have accepted the "Know Your Customer" (KYC) verification process for signup. The major issue related to cryptocurrencies insecurities are highly related with crypto exchanges, the past experience of some exchanges has drastically worsened the people believe, one of most trusted crypto exchange Mt. Gox has already set an example of this risky business, about 70% of BTC in 2014 was in trade through this single exchange in the market and it was in report that more than $450 million value of crypto holders lost their money after this website finally got closed. It seems that in previous few years the main risk of cryptocurrencies is mainly related to crypto exchanges, either by the hacking of these exchanges or bankruptcy.

Top 10 Crypto Currency market exchanges (December 31st, 2017)

Trading exchange	Crypto Market Volume captured (USD)
BINANCE	$3516500189
BITHUMB	$2706971200
BITTREX	$2193493974
BITFINEX	$1575537565
OKEX	$1207239291
BITMEX	$937312000
POLONIEX	$844989187
HUOBI	$792964425
HITBTC	$659570052
GDAX	$522157770

Source: www.coingecko.com

Cryptocurrencies and India:

The state of cryptocurrency in Indian economy can be evaluated by its nature of trading, the e-payment or digital payment system in Indian market is still in very low range which is creeping well after demonetization by Indian government in November 2016, The "Digital India" initiative has covered plenty well records during last few years in terms of digital transactions but still a massive part of India's Economy still dependent upon cash transactions due to illiteracy, poor infrastructure, and internet capability for mobile app transactions. The cashless transaction or digital payment has given by RBI annual report 2015-16, Part 2, Chapter 9; entitled by "Payment and Settlement Systems and Information Technology", and mainly these are divided into two subheads, the first one is 'Systemically Important Financial Market infrastructures (SIFMI)' and second part is 'Retail Payments'. As per this RBI annual report, SIFMI covers 90% of total cashless transactions while Retail Payment consists rest 10% of cashless transactions. In this two mode of e-payments, the retail sector transactions show the bigger amount of cashless transactions in which an Indian is directly involved rather rest of these 90% e-transactions are related with institutional bodies, financial intermediaries etc. So that the burning question arises, the amount of crypto trading in which Indian traders are involved is not a part of any type of these digital payment methods. The Indian crypto traders are directly involved in crypto trading for the

speculation and arbitrary motives because any physical commodity or services in India doesn't support any crypto payment. Other reasons may be possible behind this, traders might be investing for profit-making over extra income which they prefer to invest in cryptocurrencies for a hope of a big return on it. This is also bearing in mind that many crypto trading startups are opened during the last one and two years, these startups are not authorized by any government body or Institution of Indian Government. One of the major Indian crypto exchange "Koinex" gives its user to trade five major cryptocurrencies namely Bitcoin, Ripple, Ethereum, Litecoin, and Bitcoin cash. Koinex has total 2580 BTC amount of market cap today. Many other Indian crypto exchanges have also thousands of user accounts already registered via a normal KYC verification. These crypto exchanges aired a news to their account holders that they are continuously trying to contact with government bodies regarding policy implementation for crypto traders of India, and if in future everything will be in favour these exchanges, the Indian government might be considered crypto trading as a part of wealth and will impose Capital Gain tax over it and they are preoccupied this idea from US government policy for crypto markets. Compare to some foreign crypto exchange sites, these Indian crypto exchange sites are doing fairly well in terms of rule and obligations, but it is not guaranteed that a trader's money is safe in their cryptocurrency wallets because they are not claiming any responsibility for investors' money, if the Government ruled out these exchanges from the economy.

Conclusion:

The conjecture of cryptocurrencies is challenging task for scholars, any positive or negative comment on it might be only a part of axiom. Historical facts reveal that the convenience of any e-payment methods can be threatened by hackers and crypto is not apart from this. The main risk which is involved in crypto trading is related to its exchanges and ICO's security levels, other threats might be happening through the wallets security breach. The developing countries like India have already cyber issues and it seems that crypto trading is not a preferable choice by Indian government because of their price volatility and uncertainty. Arbitrage through foreign exchanges is preferred as like gambling Investment. Recently in December China and South Korea has already taken action against their native crypto trading exchanges that caused the major crypto prices are going down rapidly. The factors which determine a crypto coin price are heterogeneous and government policies against crypto trading create a big impact on crypto prices globally. The anonymity of accounts might be used for money laundering, terror funding etc., but due to its efficient nature of the transaction which is highly secure between traders that can't be tempered or changed, also creating interest among people who are trading goods and services with these cryptocurrencies. Many developed economies have already implemented certain policies for crypto traders and somehow they are monitoring the transactions. The past events reveal that fraud related to crypto trading mainly comes from its exchanges, ICOs or Wallets section breach, if the government take initiative to control these exchanges and ICOs or monitor them, then cryptocurrencies might become parallel fiat currency for an economy.

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