

International Journal of Advance Research in Computer Science and Management Studies

Research Article / Survey Paper / Case Study

Available online at: www.ijarcsms.com

Crypto Currency: Bubble or Boom

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Abstract: *Crypto currency has taken the world by storm. The financial industry is facing the heat of crypto currencies and block chain technology. Banks have started feeling the pinch with alternate and innovative block chain based solutions for money transfers and other payment solutions. Post economic crisis of 2008, virtual currency is being looked upon as an alternative to existing financial infrastructure based on banks, credit cards and other payment networks. A currency system not tied up to a country's government is seen as a solution to prevent manipulation in value of currency by central authority intervention. However, Governments are divided on actions to be taken with respect to use of crypto currencies as a legal tender. This paper is an attempt to understand the architecture of crypto currency, its robustness in relation to existing currency, global scenario and crypto currency market in India. It is observed that crypto currencies are too powerful to be ignored. Adaptation of existing monetary system to incorporate virtual currency with robust security features is the way out.*

Keywords: *Crypto currencies, block chain technology, fiat currency, government and central authority, Indian scenario.*

I. INTRODUCTION

Crypto currency has taken the world by storm. In December 2017, the market value of crypto currencies was pegged at USD 750 bn. It is growing exponentially witnessing 1240% yoy growth. Bitcoins, one of the leading virtual currency is valued at USD 13925 / bitcoin. (Coinbase exchange) on 31st December 2017. In 2009 it was priced at USD 0.001/ bitcoin. The financial industry is facing the heat of crypto currencies and block chain technology. Banks have started feeling the pinch with alternate and innovative block chain based solutions for money transfers and other payment solutions.

The financial crisis of 2008 has brought out the weaknesses of current financial system. Many countries are witnessing severe devaluation of currencies. In such a scenario, a currency system not tied up to a country's government is seen as a solution. Virtual currency is being looked upon as an alternative to existing financial infrastructure based on banks, credit cards and other payment networks. However, Governments perceive it as a possible threat to its ability to control the monetary policy in an economy using currency, (Staiger and Skykes, 2010). There are concerns about illegal activities conducted under the wraps of bitcoins. Silk Road website used bitcoins to pay for drugs. Governments are divided on actions to be taken with respect to use of crypto currencies as a legal tender.

This paper is an attempt to understand the architecture of crypto currency, its robustness in relation to existing currency, global scenario and crypto currency market in India.

II. DECRYPTING CRYPTO CURRENCY ARCHITECTURE

Crypto currency emerged as an attempt to build a digital cash system without a centralized authority. The idea of digital currency was explored as early as 1980's. Businesses offered digital currency to their customers which could be used to make purchases or stored as credit. The first form of internet money was invented by David Chaum, an American cryptographer,

using encryption algorithm RSA in Netherlands. The technology garnered a lot of attention. Many companies started offering payment solutions to customers in the form of internet money which can be used to make payments e.g. PayPal. Another attempt was e-gold where physical gold deposits from customers were converted into gold credits in their accounts. The 2008 economic crisis highlighted the weakness of central authority backed currencies, when the value of currency floundered. Satoshi Nakamoto published a paper in 2009 introducing the concept of block chain and first crypto currency – bitcoin to the world. Crypto currency works on the mutual trust and consensus of all the participants in the network using block chains technology.

A crypto currency transaction commences with a user entering the network with an electronic wallet. A wallet is a software program in which the private keys to transact with block chains on the network is encrypted. It indicates ownership of a public key – digital code connected to a certain amount of currency. It is equivalent to a bank account. A wallet allows one to receive, store and transfer crypto currency to others. It can be installed on a computer or a mobile device. There are different wallets for different crypto currencies viz. Bitcoin core wallet for Bitcoins, Litecoin-QT for Lite coins, Ethereum wallet for Ethereum.

Transactions are sent from one electronic wallet to another. Every transaction is stored in an open source distributed Public Ledger. The Public Ledger contains encrypted identities of coin owners and legitimacy of transactions. Each transaction has an input (source of coins), amount (transaction amount) and output (receiver of coins). Once a transaction is sent to the crypto currency network using an encrypted electronic signature, it is verified by the miners. The network collects all the transactions during a specified period into a list called as ‘block’. These blocks are verified before the transaction is accepted. The miners uses the information in the block, apply mathematical formula and converts it into a sequence of letters and numbers called ‘hash’ which is a link to the previous block and a stamp of time. This process confirms the transaction. This sequence is stored along with the block at the end of the block chain. Every such sequence is unique. Once the block is confirmed and sealed by the miner, it is added to the existing block. Thus a chain of block is created and updated after every transaction. A block chain is thus a continuously growing list of transactions called blocks. Every users’ block chain i.e ledger gets updated. A block chain is thus managed by a peer-to-peer network collectively by following a set protocol for validating new blocks. Once a block is added to the existing block chain, it becomes permanent. The data in any given block cannot be changed without changing all subsequent blocks which is very difficult since there has to be a collusion amongst the network participants. This ensures that a coin holder does not use the same coin for multiple transactions. Every member in the network has the updated ledger which contains every transaction in the block chain since its inception. Every member knows who owns what. Thus the trust in the transaction is built through consensus and complex mathematical code.

The first miner to confirm the transaction and seal the block get rewarded through crypto coins. This is how coins are mined. This technology was used for bitcoins and other crypto currencies. Block chain technology is expected to revolutionise business, (Iansiti and Lakhani, 2017). Emerging block chain technologies like ‘smart contract’, ‘proof of stake’ and ‘block chain scaling’ are being experimented by users.

Thus crypto currency transactions are an amalgam of anonymity and traceability, (Meiklejohn, S. et al, 2017). Real identities are not required to conduct a transaction whereas all transactions are recorded in a public and global ledger.

III. UTILITY AND VALUE OF CRYPTO CURRENCY VIS-À-VIS FIAT CURRENCY

Globally, crypto currencies are being increasingly used in purchase of products and services like travel, flights, car rentals, buying and selling luxury goods, crowd funding, international money transfers, donations etc. Thousands of merchants are accepting these currencies as payments. There are reports of it being used in online gambling. Crypto currency market is sky rocketing with total market capitalization of USD 750 billion in December 2017 from a humble USD 7 billion in 2014. The number of crypto currencies are also increasing. As on December 2017, there are around 1380 currencies on the internet. The oldest and the largest block chain network is Bitcoin followed by Ripple, Ethereum, Bitcoin cash, Litecoin, Monero etc. It becomes imperative to understand how crypto currencies derive their value.

A currency possesses important features like (i) Transactional value (ii) Store of value (iii) Unit of account. Bitcoins possess transactional value as it is being used for transacting. Bitcoins and other crypto currencies are used as an investment asset. Also these currencies are fungible and countable. Though crypto currencies apparently seem to possess the features of a legal tender or currency, there are grave concerns on its volatility, (Jon Carrick, 2016). It has shown high levels of volatility from its inception but it can be argued that all young currencies have exhibited volatility. The main difference is that fiat currency has the backing of the government whereas crypto currencies are not backed by any authority. However, it is a useful financial instrument, (Jon Carrick, 2016). Though bitcoins and other crypto currencies are susceptible to fraud and losses, increased security features are making the platform more robust. Crypto currencies get their perceived value from its features and users. It is driven by scarcity, utility, supply and demand. The coins are fungible, divisible and verifiable. To sum up, crypto currency and the block chain technology are too powerful to be ignored, (Sontakke and Ghaisas, 2017).

The following figures highlight the increasing popularity of major crypto currencies across the globe in terms of market capitalization, trading volume and coin prices.

Figure 1 highlights the increasing market capitalization of top ten crypto currencies. It has increased from USD 14 bn in 2014 to USD 450 bn in 2017.

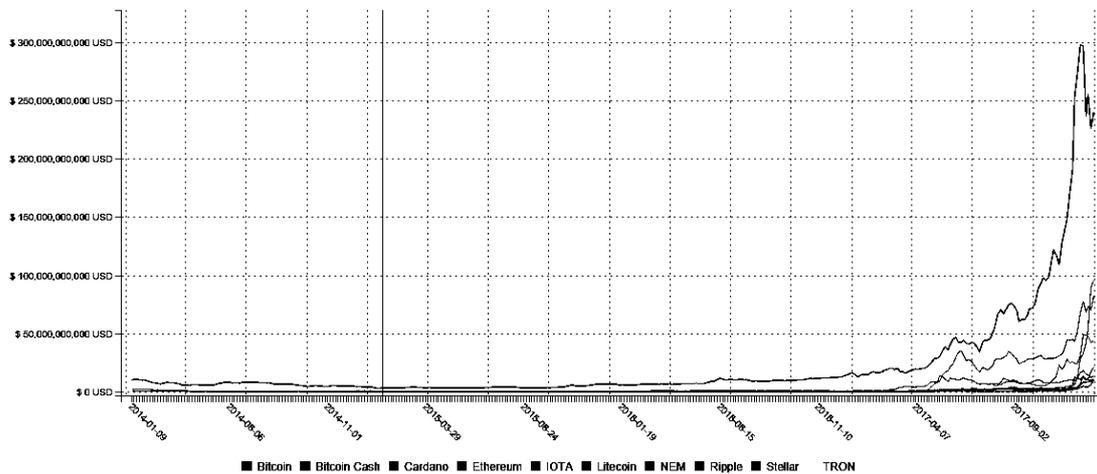


Figure 1. Market Capitalization of top ten Crypto currencies (Source: <http://www.cryptocurrencychart.com>)

As seen in Figure 2, the trading volume has increased to USD 40 billion in December 2017.

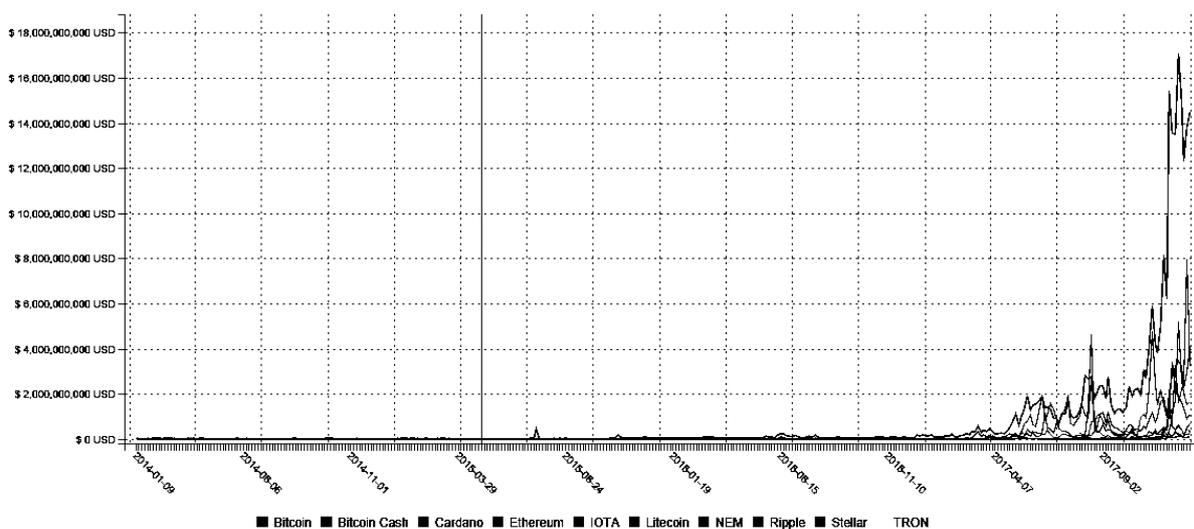


Figure 2. Trading volume of top 10 Crypto currencies (Source: <http://www.cryptocurrencychart.com>)

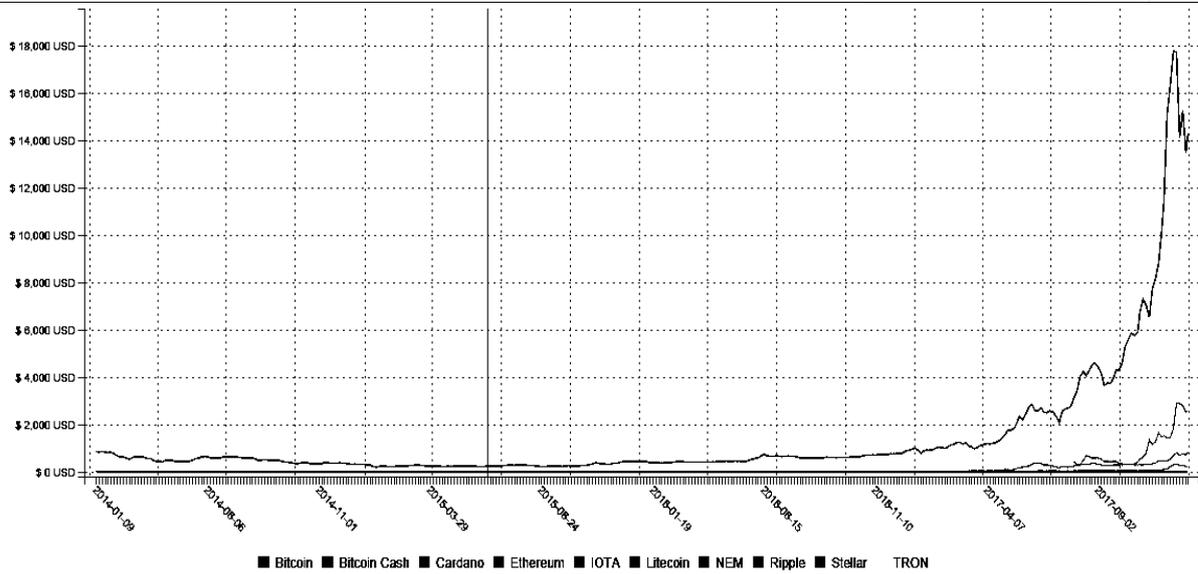


Figure 3 Coin price of top 10 Crypto currencies (Source: <http://www.cryptocurrencychart.com>)

The coin prices have also increased exponentially. As seen in Figure 3, the price of bitcoins have increased from USD 901.36 in January 2014 to USD 13580.11 in December 2017. Litecoin has increased from USD 26.74 in January 2014 to USD 225.39 in December 2017. Another popular crypto currency Ethereum, priced at USD 0.737 in December 2014 has increased to USD 735.77 in December 2017.

IV. GLOBAL STAND ON CRYPTO CURRENCY

Globally, the market is very bullish about crypto currencies especially trading of such currencies. Crypto currency has started impacting currency market. However, the Governments and central banks of countries are very cautious about this phenomenon. Very few countries have accepted it as legal tender. Countries like Bangladesh, Thailand, Iceland and Nigeria have declared the use of such currencies illegal. In Bangladesh, transactions using crypto currencies are considered as punishable offence. Argentina does not accept it as a legal tender nor as a mandatory means of cancelling debt or obligations. Canada has proposed to regulate bitcoin through anti money laundering and counter terrorist funding legislation. China has banned financial institutions from using or dealing in digital currency. US is divided about use of crypto currencies. Some states in US have introduced regulations on transactions using virtual coins. Some countries have accepted crypto currency officially whereas there are some which are undecided. Australia and Japan accept it as legal tender. Brazil has declared bitcoins as an asset subject to Capital gain tax. Singapore does not subject such transactions to regulations. UK classifies bitcoins as private money and taxes it with VAT and Capital gains tax. Countries like India, France, and Austria are yet to officially announce their stand on crypto currency though trading or transactions using bitcoins or other crypto currencies is not banned.

V. DEVELOPMENTS IN THE FIELD OF CRYPTO CURRENCIES

Crypto currency markets are out pacing the regulations and developing new products and asset class using the platform of crypto coins. Innovative ways of creating exchange value and storage values of crypto currency are being explored. Crypto currency bonds and crypto derivatives are two such instruments. Bonds denominated in crypto currency have been issued with the clearing and settlement process based on block chain technology. The payments are automated by ‘smart contracts’. Experts view this as a change in use of crypto currencies from speculative transactions to a more real transaction. If crypto currencies are used more for genuine transactions, then an active market for crypto denominated bonds will be a reality, (McLellen, 2017). Another new application of crypto currencies beyond speculation is derivatives based on crypto currency as the underlying asset. Crypto derivatives is seen as the next logical step in the development of digital currency.

VI. INDIAN SCENARIO

India is a late entrant in crypto currency market. Due to restrictions in investment in foreign assets and remittances in foreign currency, Indian investors had minimum opportunities to participate in the crypto currency boom. Things changed after demonetisation. The erosion of value of money with central government’s intervention encouraged the people to look at alternative means of currency. Since crypto currency is neither controlled nor regulated by a central authority, it started gaining popularity as an investment asset especially bitcoins. Immediately after demonetisation, bitcoin was being traded at a premium of USD 440 as compared to US market due to increased demand. The price shot up from USD 896/ bitcoin to USD 1,020/bitcoin. In the three years prior to demonetisation, each bitcoin exchange in India garnered an average of one lakh registered customers and a month after demonetisation the number of registered users doubled to two lakh on an average.

Currently India accounts for about 2% of the global crypto currency market capitalisation. There are around fifteen trading platforms or exchanges operating in India and the number is increasing. The price of Bitcoin has risen from INR 38,158 in June 2014 to INR 9, 87,476 in January 2018 (Figure 4). Similarly market cap has increased from INR 49100 crores in June 2014 to 1658000 crores in January 2018 (Figure 5). It has been estimated that bitcoin trading volumes in India range between Rs 150–200 crore per month and around Rs 1200 to 1500 crores worth of bitcoins are traded in India every year. In June 2014, the trading volume of Bitcoin was INR 89 crores which has gone up to INR 30,960 crores in January 2018(Figure 6).

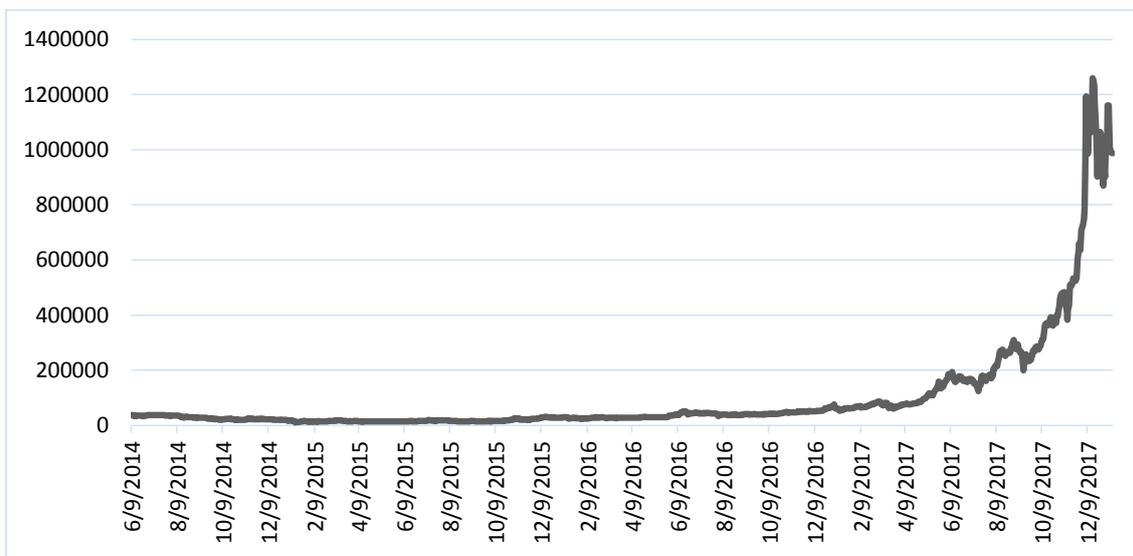


Figure 4. Bitcoin Price in India (Source: https://www.coingecko.com/en/price_charts/bitcoin/inr)

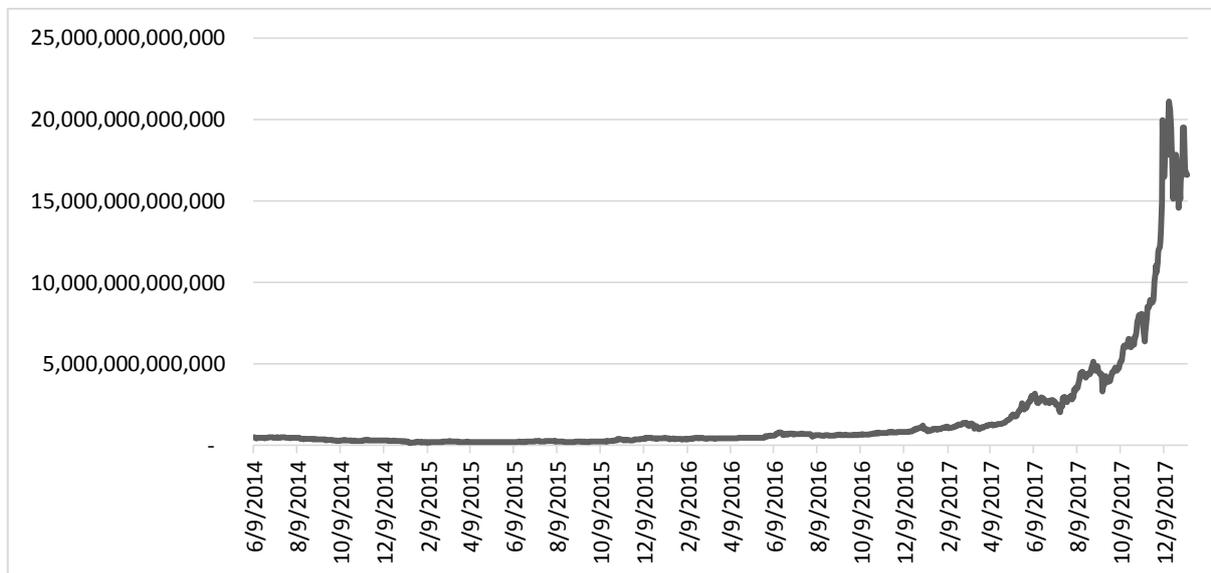


Figure 5. Bitcoin Market Capitalisation in India (Source: https://www.coingecko.com/en/price_charts/bitcoin/inr)

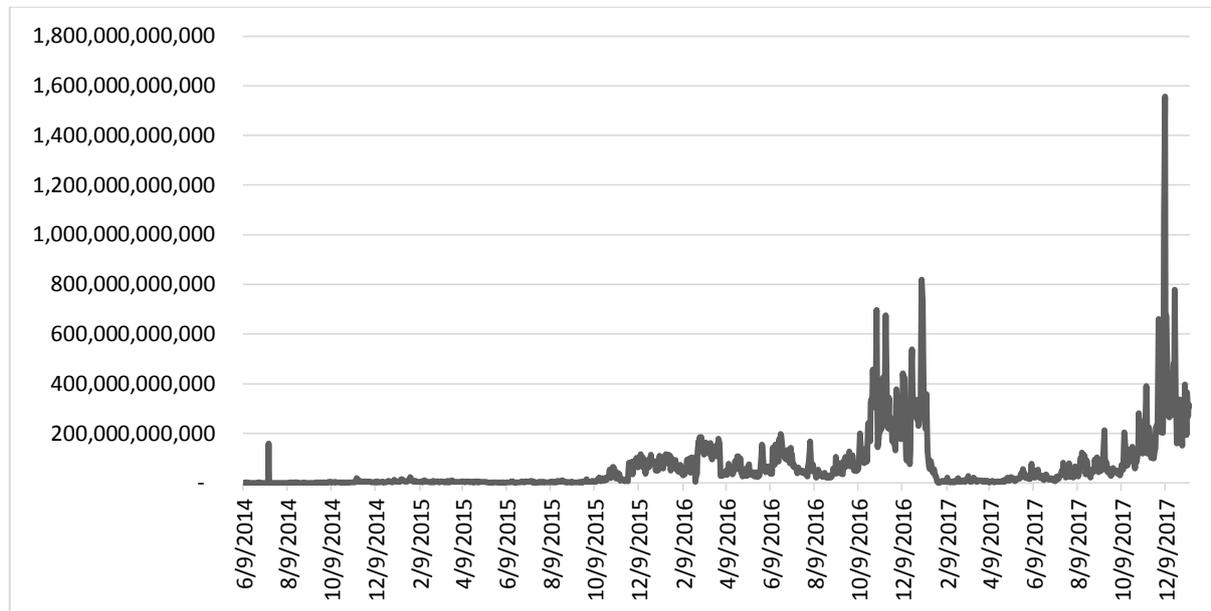


Figure 6. Bitcoin Trading Volume in India (Source: https://www.coingecko.com/en/price_charts/bitcoin/inr)

Currently, crypto currencies are being used in India as an investment asset due to price volatility. Very few merchant outlets accept it as a payment mode. E-commerce platforms accept crypto currency as a voucher which is then converted into local currency through bitcoin exchanges. Also, the security of bitcoins and e-wallets is being criticised.

VII. INDIAN GOVERNMENT'S STAND ON CRYPTO CURRENCY

RBI has clearly stated that virtual currencies are not accepted as legal tender and such currency does not have any regulatory permission or protection in India. The RBI has cautioned users, holders and traders on the risk of these currencies and clarified that it has not given any licence or authorisation to any entity or company to operate such schemes or deals. Other than cautioning the public, the RBI has not taken any regulatory stand on virtual currencies. The volatility in the prices of these currencies due to speculation has prompted the central bank warn the ill effects of such currencies as loss in value, loss due to theft or hacking, or use in illegal activities. The Government has not banned the trade of crypto currencies nor made it illegal. Thus Bitcoin is neither illegal nor completely legal. Crypto currency exchanges are operating in India and are also following compliance norms with respect to identity of the user. A committee was set up by the government to discuss about viable methods to regulate crypto currency market and the after effects of launching India's very own digital currency medium. The committee consists of senior people from Securities and Exchange Board of India (SEBI), RBI, the Central Board of Excise and Customs (CBEC), Income Tax Department and the Financial Intelligence Unit.

Securities Exchange Board of India (SEBI) has stated that if bitcoin is considered as a commodity derivative then SEBI might regulate it. Though there are still no clear regulations or proper jurisdiction, the income-tax department is clear that tax has to be paid on all crypto currency transactions. Though there is no mention of crypto currencies in the Income Tax Act, income tax will still have to be paid on any gains accruing from crypto currency transactions. Long term gains would be taxed at a flat rate of 20% while short-term gains would be taxed at the individual slab rate. The cost of acquisition for arriving at long-term capital gains will be determined after giving the benefit of indexation.

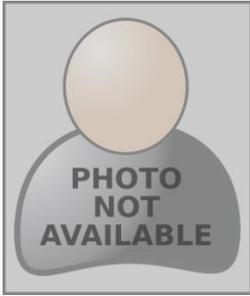
VIII. CONCLUSION

Governments and authorities across the globe are wary of crypto currencies and its growing impact on the financial systems. The choice is between banning and regulating the use of crypto currencies. Governments would not want to deprive themselves of potential benefit of crypto currencies in auguring existing financial systems through increased funding opportunities through instruments like crypto based derivatives. At the same times, there are concerns of money laundering,

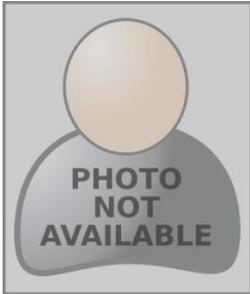
consumer protection, financing of illegal activities. In countries like US, UK, Singapore, Japan, Germany, Australia, Canada and many European countries, crypto currency transactions are subject to taxes. Other countries plan to follow suit. Thus Governments and Central Banks will have to remain a stakeholder to ensure some discipline. A robust regulatory framework, as a solution, can be devised after complete understanding of the crypto currency structure and markets. The underlying technology in the form of private public key concept provides some relief in a way that all transactions are traceable on the network. Governments, to begin with, can regulate the exchanges through which they are traded. Currently the exchanges in India and other countries are following 'Know your Customer' norms for customer identity and verification. This will also assure investor protection. Crypto currencies, as seen today, will not replace fiat currencies but can possibly exist as a parallel currency. Central Banks' authority to monitor and regulate money supply will continue to exist, however monetary policies and regulatory norms would have to be adapted to take into account the reduction in demand for real money due to virtual money (Beate Sauer, 2016). More research in the field of crypto currency is the need of the hour. Information and data availability will enable policy makers, academicians, researchers and industry to relook at existing monetary theories and develop new models incorporating virtual currencies.

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