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### RESEARCH ARTICLE

#### APPREHENSIONS WITH CRYPTOCURRENCY IN INDIA

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#### Abstract

The growth in information and communication technology has led to phenomenons in the financial sector as well. This primarily alludes to the introduction of cryptocurrencies, a decentralised medium of exchange, which provides an alternative to the centuries-old idea of physical money. There is a visible relationship between the principles of behavioural finance and the value/returns that these cryptocurrencies have. These currencies are not dependent on the behaviour of the financial markets and economy but instead on the supply and demand of the currency along with its popularity; which is dependent purely on the individuals.

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#### Introduction:-

The growth in information and communication technology has led to phenomenons in the financial sector as well. This primarily alludes to the introduction of cryptocurrencies, a decentralised medium of exchange, which provides an alternative to the centuries-old idea of physical money. There is a visible relationship between the principles of behavioural finance and the value/returns that these cryptocurrencies have. These currencies are not dependent on the behaviour of the financial markets and economy but instead on the supply and demand of the currency along with its popularity; which is dependent purely on the individuals.

Cryptocurrency contradicts the beliefs of 'Markowitz's Modern Portfolio Theory' which includes: (1) both the markets and investors are rational; (2) investors are only interested in the utilitarian characteristics; (3) investors should design their portfolios according to the rules of mean-variance portfolio theory. Hence, while analysing cryptocurrency it is important to consider the behavioural aspects such as biases, that help determine its value, with help of the concept of Behavioural Finance.

Ergo, it is important to take into account the relationship between behavioural finance and cryptocurrency; which remains to be constantly fluctuating and volatile in nature to understand the apprehensions of a common individual overwhelmed by the concept of cryptocurrency, leading to their unwillingness to accept its legitimacy as a currency.

#### Cryptocurrency

Cryptocurrency, is a digital decentralised currency system, based on blockchain technology. It is an accepted medium of exchange that can be used to settle virtual and real transactions, without the physical presence of the individuals.

The distributed consensus system of cryptocurrency makes it possible to send and receive money in the cryptocurrency form; without relying on other various third-party services available. The value and the regulation of

the cryptocurrency are not in the hands of a centralised authority, but instead in the hands of the users of cryptocurrency, causing it frequently to fluctuate.

Bitcoin, introduced in 2008 by Satoshi Nakamoto in a paper: “Bitcoin: A Peer-to-Peer Electronic System”, was the first cryptocurrency. It was based on the fundamentals of the system of blockchains and is now the most popular and highly traded cryptocurrency, worth approximately \$63,904 (as of 13th November, 2021)

### **Blockchain Technology**

Blockchains, also known as Distributed Ledger Technology (DLT), is a database that stores all digital transactions in encrypted blocks of data. These blocks of data are then linked together as chains to form the database.

This sort of technology has the capability to reduce fraud and risks while increasing transparency amongst users. The decentralised network of blockchain incorporates an intensified system of reliability and system reliability.

The blockchain consists of three components: nodes, miners and blocks. The blocks are present in every chain and this block contains the data of the entire chain. Miners, through a capital intensive process known as mining, create new blocks on the chain; due to incentives and rewards. Nodes are any electronic devices that maintain the copies of blockchains and overview the functioning of the network.

### **Usage of Cryptocurrency**

Cryptocurrency has gained popularity over the past few years, while it has not yet nor intended to replace the centralised mode of exchange through physical currency.

### **Mode of Payment**

There are some limitations to cryptocurrency as it is not recognised or accepted everywhere. However, there are some merchants all over the world such as restaurants, jewellers, flights, applications and various gift cards that do accept cryptocurrencies such as bitcoin. Corporations such as Apple Inc, allows ten types of cryptocurrencies as a mode of payment and in settling transactions. Hence, it can be used as a mode of payment in some situations. Alongside, there are also digital marketplaces that sell NFT (Non-Fungible Tokens) such as art work, music, video, documents, etc.

### **Investments**

The most common usage of cryptocurrencies as of recently, has been as an investment option. Its value remains to be very volatile and lucrative, and can bring tremendous returns. Such an example is Bitcoin, which frequently suffers from erratic price changes. Fluctuations of price in cryptocurrency are not based on any sort of materialistic change and the price remains to be dynamic and dependent on the people and its popularity.

In countries clouded with political and economic instability, cryptocurrency seems to be more stable and reliable than their own currency. This helps various citizens in these nations when it comes to remittances and no additional fees on their money.

### **Survey Data**

In June 2021, anonymous primary data of two hundred eighty individuals was collected via means of an online survey. They were asked various questions about their knowledge in regards to cryptocurrency and along with their willingness to invest and other popular notions regarding the same. The survey consisted of eleven questions, primarily with multiple-choice answers with the option to add an answer if none of the given answer options were relevant to the individual.

1. Individuals were asked whether they invest in cryptocurrency. The survey presented them with a yes or no answer to pick between - 84.3% of participants picked the ‘no’ option and the remaining 15.7% participants picked the ‘yes’ option.
2. Next, the participants were asked whether they would be **willing** to invest in cryptocurrency. Once again, only the yes or no options were presented - 53.6% of participants picked the ‘no’ option and the remaining 46.4% picked the ‘yes’ option.
3. As a follow up to the previous question, individuals were asked to explain their yes or no answer.

The 53.6% of participants who answered 'no' were given the following possible reasons for their decisions along with an 'other' option as part of their justification. (1) lack of backing from the Indian government/gold reserves (2) volatility (3) belief that it is a trend (4) transaction risk (5) risk of hacking (6) immoral - can be used to fund illegal activities (7) unaware about cryptocurrency and its functioning.

1. 34% of the participants (out of those who said they were unwilling to invest in cryptocurrency) picked the option 'lack of backing from the Indian government/gold reserves'.
2. 20.7% picked the option 'volatility'.
3. 11.3% picked the option 'belief that it is a trend'.
4. 8.7% picked the option 'transaction risk'.
5. 8.6% picked the option 'unaware about cryptocurrency and its functioning'.
6. 8% picked the option 'immoral - can be used to fund illegal activities'.
7. 5.3% picked the option 'risk of hacking'.
8. The remaining 3.4% of participants picked the 'other' option, stating reasons such as environmental concerns, profitability, and artificially made virtual asset that has no real value.

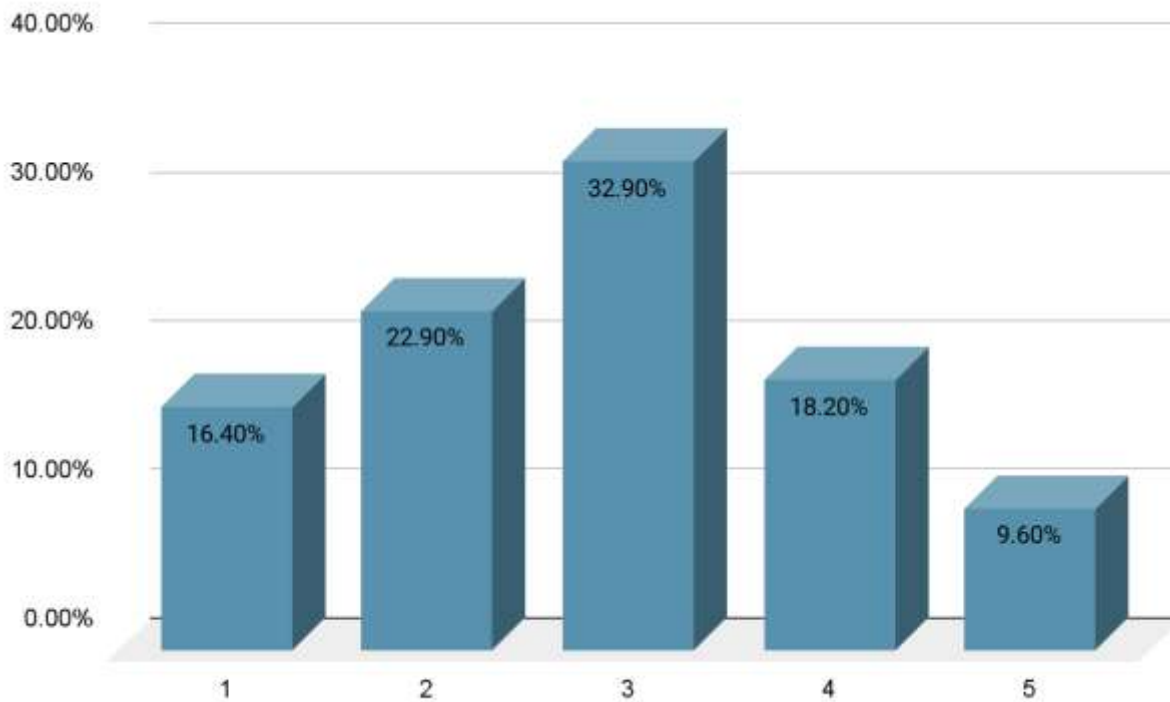
The 43.6% of participants who answered 'yes' were given the following possible reasons for their decisions along with an 'other' option as part of their justification. (1) potential long term profit (2) potential short term profit (3) alternative form of currency (4) to keep up with the latest trends (5) innovative technology (6) unregulated - not dependent on the government.

1. 43.8% of the participants (out of those who said they were willing to invest in cryptocurrency) picked the option 'potential long term profit'.
2. 16.2% picked the option 'alternative form of currency'.
3. 14.6% picked the option 'potential short term profit'.
4. 14.6% picked the option 'innovative technology'.
5. 6.2% picked the option 'to keep up with the latest trends'.
6. 3.8% picked the option 'unregulated - not dependent on the government.'
7. 0.8% picked the 'other' option claiming it would have both short and long term profits.

The individuals were asked whether they believe that cryptocurrency would replace modern day currency - cash, credit cards, debit cards, cheques - in the future. They were presented with the yes or no options. 76.1% of the participants picked the option 'no' and the remaining 23.9% of participants picked the option 'yes'.

They were asked whether they believed that cryptocurrency was a smart investment. Once again, they were presented with only yes or no options. 56.8% of the participants picked the option 'no' and the remaining 43.2% of participants picked the option 'yes'.

Next, the participants of the survey were asked if they knew how cryptocurrency works. They were given a range between 1-5 to indicate their understanding. The number one indicated no understanding of the concept and the number 5 indicated complete understanding of the concept. 16.4% of participants chose the number one, 22.9% of participants chose the number two, 33.9% of participants chose the number three, 18.2% of participants chose the number four and 9.6% of participants chose the number five. The following data can be visualised as seen below.



1. The participants were then asked whether they kept up with the current news and trends in regards to cryptocurrency. The options presented were 'yes', 'no' and 'occasionally'. 52.1% of the participants chose 'occasionally', 30.4% of the participants chose 'no' and the remaining 17.5% participants chose 'yes' as an option.
2. They were then asked whether they believed cryptocurrency was secure/safe, presented only with 'yes or no' as options. 68.6% of individuals picked the option 'no' and the remaining 31.4% of individuals picked the option 'yes'.
3. Finally, they were asked whether they believed one of the leading uses of cryptocurrency was to fund illegal activities. Presented with yes or no answers, 61.8% of the contributors said 'no' and 38.2% said 'yes'.

#### Data Analysis

1. From the survey data, we can infer that the majority of the individuals do not/have not invested in cryptocurrency. However, 30.7% of individuals who do not currently invest in cryptocurrency are willing to. An overall 46.4% of the participants said that they would invest in cryptocurrency. This willingness has failed to translate into action due to a variety of possible factors; the most seemingly prominent factor being lack of complete understanding in the workings of cryptocurrency.
2. The remaining 53.6% of individuals unwilling to invest in cryptocurrency have various apprehensions regarding the same. The predominant reason for this is the risk-averse nature of these individuals. From the options provided to the participants, the majority of the reasons provided to account for unwillingness to invest in cryptocurrency cater to the risk-averse characteristics - volatility, lack of dependence on the government, transaction risk and hacking.
3. However, the data shows that the principal reason that people are willing to invest in cryptocurrency is its volatility. The possibility of reaping great profits in either the long term or short term. This caters to the risk-seeking characteristics of these individuals, as they are basing this decision on the basis of a gamble - hoping for monetary gains - and not in fact for the digital currency itself.
4. We can also observe herd mentality to be a cause for willingness to invest amongst those who are willing. 14.6% of the participants substantiated their willingness to invest in cryptocurrency due to the popular trends.
5. Vast majority of people - even those who are willing to invest in cryptocurrency - do not believe that cryptocurrency will replace the current monetary institutions. When asked if they believed that cryptocurrency will be the future of currency and replace the modern banking structure, 22.5% of the individuals willing to invest did not believe this. This once again, can be used to expound the risk-seeking and gambling nature of

these individuals on a monetary basis. The primary principle of investing is only to do so when you believe in a certain product, service, corporation; hence, you believe that it will increase in value.

6. We see a repeat of the same occurrence, as when we asked individuals if they believed that the investments in this industry were smart decisions, 3.2% of the individuals who were willing to invest stated their lack of belief in this.
7. As shown in the graph above, 16.6% of people don't understand how cryptocurrency works, 22.7% of people have minimal understanding regarding the same, 32.9% of the people believe they have decent understanding, 18.4% of people believe they have a good understanding and 9.4% believe that they have complete understanding regarding the matter. While these individuals are claiming for this to be the case, only 17.5% of the individuals read about matters related to cryptocurrency. 52.1% of the individuals claim that they 'occasionally' read about matters regarding cryptocurrency. This can help us make the assumption that many individuals have a bias in regards to their actual understanding.
8. The data provided can also help determine that a close majority of individuals believe that cryptocurrency is not a 'phase', meaning that they believe that cryptocurrency will continue to be a sector where investments would continue. This would also mean that 47.1% of individuals believe that investments in cryptocurrency are primarily due to popular culture and trends - a source of herd mentality.
9. A wide majority of individuals believe that cryptocurrency is not safe or secure, including those who are willing to invest in it. 22.2% of the people willing to invest in cryptocurrency do not believe that it is safe or secure. However, studies conducted have determined that net banking is more susceptible to hacking than cryptocurrency.<sup>1</sup>
10. Majority of individuals have moral concerns when it comes to cryptocurrency, 61.8% of people believe that it is primarily used to fund illegal activities as an ode to its anonymous and decentralised nature. However, research shows that less than 1% of cryptocurrency transactions are used for illicit activities.<sup>2</sup>

### **Apprehension**

The popularity of cryptocurrency has aroused many people's suspicions and many concerns. Even though cryptocurrency has always been the subject of numerous news articles and headlines, many people do not believe that cryptocurrency has a real purpose and disregard it as a currency. In the constantly spreading misinformation about cryptocurrencies, it is difficult for individuals to distinguish between true and false. Cryptocurrency is based on a new form of technology that not everyone knows, so some people are reluctant. Based on the collected primary data and second-hand data, and with the help of behavioral economic theory, we can make assumptions about the main concerns and concerns of cryptocurrencies.

### **Risk-Aversive Behaviour**

Risk-Aversive behaviour is the tendency of an investor to prefer certainty over possible uncertainty. It is a trait where an individual would prefer avoiding a loss than possibly making a profit. Cryptocurrencies are very volatile in nature, changing in value tremendously. As it is not backed by a commodity or a government, there is no body to ensure stability in any sense. These individuals are wary if making a loss even in the expense of immense possible profits,

### **Volatility**

Cryptocurrencies are very volatile in nature, as they have no real value on their own. The value of the coin is dependent on its popularity and the supply and demand of the coin. There is no sense of stability with these coins, as can be seen with the DogeCoin incident with Elon Musk. When Elon Musk tweeted out about the DogeCoin, there was immediate frenzy and millions began to buy, sell and trade these coins. However, this craze soon died down and the value of these coins plummeted. The lack of stability and backing from a commodity/government, continues to present the stance that the coin prices are unregulated and can lead to economic frenzy.

### **Anchoring Bias**

Anchoring bias is a cognitive bias that causes us to rely too heavily on previously given information.<sup>3</sup> In terms of cryptocurrency, there is reluctance in investing as individuals see prices of the coins in the past and note how the

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<sup>1</sup><https://blackkite.com/which-one-is-more-secure-banks-or-cryptocurrency-exchange-markets/>

<sup>2</sup><https://www.businessinsider.com/cryptocurrency-blockchain-security?IR=T>

<sup>3</sup><https://blog.coinbase.com/fact-check-crypto-is-increasingly-being-used-for-criminal-activity-and-is-a-haven-for-illicit-856a71dfb399>

price was relatively much lower. This bias ‘anchors’ them into believing that the value of the coin should not be that high and are constantly comparing it with an ‘anchor price’.

### **Security Concern**

One of the primary reasons individuals are hesitant in investing in cryptocurrency is because they do not believe that it is safe. There is a lot of misinformation about cryptocurrencies, which causes people to have biases and hence are reluctant. However, blockchain technology, according to the Pentagon, can be used as a cybersecurity shield.<sup>4</sup> The technology that cryptocurrency is based on - decentralised consensus based blockchain network - is secure and the success of hacking is very low. The most common way a blockchain can be hacked is if a single user gets access to 51% of all the nodes on the network. Hence, forcing consensus of all the nodes. According to an article in Mint<sup>5</sup>, “hacking a cryptocurrency is like breaking into the mint and printing more money. It may be possible, but is very improbable.”

In fact, it is the cryptocurrency exchange platforms that are susceptible to hacking. Hence, it is important to find a secure platform to make your investments through along with your digital wallet. There are also scam cryptocurrencies, such as the ‘One Coin’, which was considered to be a Ponzi Scheme and lured millions of investors while not even having a real cryptocurrency backing it nor a blockchain. Another risk in cryptocurrency is that of losing your password; if a password is lost there is no way to retrieve any of the coins in your wallet.

### **Moral Concerns**

As per the primary data collected, 38.2% of individuals believe that cryptocurrency is primarily used to fund illegal/illicit activities, such as terrorism, violence and drugs. However, the role of cryptocurrency has been overstated in this. As per research conducted by the firm Chainalysis in 2020<sup>6</sup>, 0.34% of all cryptocurrency transactions are criminal. Between 2019 and 2020, this percentage showed a steady decline from 2% to 0.34%.

Blockchain Technology is based on a distributed ledger, where all the transactions are recorded. This technology can be used to trace criminals and their transactions. However, the forensic tools have been underutilised and not trained adequately for this. An official at the CTFC stated that it was easier for the law enforcement to trace illicit activity using bitcoin, as compared to cross-border illicit activities using the traditional form of international banking and cash transactions.

### **Lack of Understanding and Knowledge**

Despite the popularity of cryptocurrencies, not many people understand their functions. Blockchain technology is a relatively new concept, and most people don't understand it. People are often at a loss for understanding what cryptocurrency is because they are not familiar with the concept of decentralized, unregulated currency, and they do not understand what a blockchain is. In general, the interpretation of cryptocurrency is not suitable for laymen who do not understand coding or keep up with technology. Therefore, people are reluctant in matters concerning the issue of cryptocurrency. This also includes institutions such as banks and governments.

There is a wide range of fake news and misinformation on the issue of cryptocurrencies. It has been given false narratives about funding criminals, terrorists, and various other illegal groups. The government keeps the same stance about cryptocurrency. Most nations are unable to formulate policies and bills regarding cryptocurrency in their nations. The portrayal of cryptocurrencies in the media is usually negative, hence giving individuals this idea as well.

### **Conclusion:-**

Cryptocurrency has revolutionised the financial-technology industry, along with transactions all over the world. Simplifying the functions of banking institutions, in a more efficient manner. To open an account for transactions, individuals have to go through standard KYC procedure. There are no transaction or banking fees involved, nor are individuals required to maintain a minimum balance. Widening financial institutions to those who are unable to open bank accounts and cannot afford the fees.

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<sup>3</sup> Definition - <https://thedecisionlab.com/biases/anchoring-bias/>

<sup>4</sup> <https://www.businessinsider.com/cryptocurrency-blockchain-security?IR=T>

<sup>5</sup> <https://www.livemint.com/brand-stories/are-cryptocurrencies-safe-to-invest-in-11635847687641.html>

<sup>6</sup> <https://blog.chainalysis.com/reports/2021-crypto-crime-report-intro-ransomware-scams-darknet-markets>

Along with using cryptocurrency for transactions, it can also be used for investments. The volatile market is very dynamic as the value of cryptocurrency is not backed by any commodity or the government. The value of the cryptocurrency is dependent on its popularity and the supply and demand of the coin. Hence, the scope of profit and loss is erratic and much like a gamble.

As per primary data collected, 84.3% of people do not invest in cryptocurrency. However, 46.4% of people are willing to invest in cryptocurrency and this willingness is unable to translate into action - which seems to be an area of concern. The most predominant reason for reluctance in investing in cryptocurrency is due to the widespread misinformation. The reason why individuals are willing and unwilling to invest in cryptocurrency is due to its same attribute of volatility.

Many individuals remain apprehensive towards cryptocurrency due to their own risk-averse behaviour. The anchoring bias is also cause for many individuals to be reluctant in investing, especially when it comes to coins such as Bitcoin and Ethereum that are considered to be expensive. There are also security concerns regarding the cryptocurrency network; people believe that it is susceptible to hacks and there are transaction risks. Although, cryptocurrency is considered to be on a safer platform than most online banking platforms. Moral concerns are also the cause of this reluctance, as there is a false narrative that over exaggerates cryptocurrency's role in all forms of illicit activities.

Cryptocurrency has already revolutionised the world of digital currencies and its relevance in today's world only continues to increase. It can be used as a way to bypass heavily taxed remittance fees in various underdeveloped nations, catering to a whole population of individuals who did not have access to banking institutions or the means through a screen. It can be of greater use than a currency, when a nation is facing economic instability and hyperinflation. The world now has begun to accept cryptocurrency as the future of currency, beginning with El Salvador that announced the acceptance of Bitcoin as legal tender. However, people need to have a greater understanding of cryptocurrency as it can be used to benefit millions. The government and media must stop portraying cryptocurrency under false narratives as the currency of criminals, and should utilise cryptocurrency to help their population.

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