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Crypto Currencies: The Future of Money

Kevin Abraham Jose¹, Dr. Suresha B²

¹Student, Masters of Business Administration-Finance Management, Christ University, Bengaluru, 029,

²Associate Professor, Department of Management, Christ University, Bengaluru, 029,

Abstract: *Envisioning a future where the power is restored back to the public, we aim for a currency system which is organic and can adhere to the functions of a global economy. As the world is growing to become more and more economically unsafe, this paper explores the possibility of cryptocurrency being the future of money. The world has seen a boom in these currencies especially bitcoins due to the demand for these currencies in the market. This model of currency also uses block chain technology to monitor all transactions making it faster and more secure. Thus in a future of immense opportunities, technology and innovation there exist a huge scope for these products under crypto space. For this research, the sample size considered are all the nations who have an exchange specially dedicated to trading crypto currencies. The methodology used in this paper is exploratory research model. This type of research method has been implemented since this field of study has not been fully explored. To substantiate the effectiveness of my study, multiple regression models have been formed analysing the impact of various macroeconomic factors on the adoption rate of these currencies in a nation.*

Keywords: *Cryptocurrency, Block chain, Bitcoin, Cryptograph, Mining, Multiple Regression*

I. CONCEPTUAL BACKDROP

Money is considered to be one of the most valuable commodities utilised across the globe. This medium of exchange can be seen in various forms and can be considered to be an important instrument in the modern economy. Due to certain drawbacks of using metal currency or paper based currency, the world has introduced a new concept of virtual/digital currency named “Cryptocurrency”. Use of new technology along with the support from the advancement of encryption, network computing and innovation in the field of money led to the rise of a currency which uses peer to peer network and also avoids any external interferences. (Dong He, 2016). This model of currency uses cryptography to secure the day to day transactions in the virtual space. The first ever cryptocurrency to be fully decentralised is Bitcoin. This form of currency was first introduced by a team of developers known by the name “Satoshi Nakomoto” in the year 2009. As of now, bitcoin is considered to be one of the most popular and widely used cryptocurrency in the world. One of the most unique features of this model of currency is that it is organic. This means that the government or any other institution have no control or power over this currency. Other than bitcoins, some of the other cryptocurrencies seen across the globe are Ethereum, Ripple, Litecoin, Zcash, Dash and Monero. Many of the institutions across the globe use this model because of its irreversible nature which helps in confirming the transactions and avoids any interventions without permission. As of December 2017 there are more than a thousand cryptocurrencies existing in the market. These cryptocurrencies are used and traded over the internet with no external interferences. There are over 1400 digital currencies in existence as of today. All these transactions are recorded in the public database which can be denoted as “Blockchain”. These cryptocurrencies are generated in the market using the concept of mining. This includes the use of powerful computers which are used to solve blocks and mine a coin. There are many super computers designed for the purpose of mining as the cost of mining a coin on a normal computer costs more than the actual value of a cryptocurrency.

One of the most feared facts about cryptocurrency is that these currencies can be easily reproduced by the use of a computer. This has been known to be one of the most common reasons why it is not been implemented in many economies. There have been various preventive measures to avoid any reproduction of these digital currencies. It has been lately considered that most of these cryptocurrencies have finally countered this problem and are safe to be used for the purpose of any transactions. These transactions have no additional costs as there is no physical existence and intermediaries involved during these transactions. Hence this model of currency has immense scope across various avenues due to its unique feature of anonymity.

The use of virtual currency is seen in everyday world ranging from online payment systems to business transactions. This opens up a huge opportunity for these cryptocurrencies to be utilised in various forums. Though these currencies have immense scope, the current financial structure prevailing in most economies across the globe was not build to regulate and handle these modern currencies. With the increase in adoption rates and also an increase in the number of transactions, it is only a matter of time for the global economy to consider a shift into a technologically driven economy. These currencies are also been considered as a tax haven

for many investors because these currencies cannot be impacted by the inflation or any of the government policies. Hence these currencies don't tend to lose their value. As per a report published in: 'The Economist', Bitcoin is considered to be the most valuable currency in the world. Many incidents which include various scams like the Silk Road and other incidents when led to the currency being used for various illegal activities raised the question for the existence of these cryptocurrencies. The ability of these currencies to be traded in the market like commodities also raises the question on the price fluctuations due to market changes.

II. REVIEW OF LITERATURE

The base article selected for this study is written by Madeleine Gartz and Ida Linderbrandt. The article is titled "Are cryptocurrencies the future of money?" published in the year 2016. This article helps in exploring various opportunities available in the field of cryptocurrency and analysing whether this model of currency can be implemented in the economy of a nation. (Madeleine Gartz, 2016). Similarly I have analysed 23 articles on various aspects governing the crypto space along with the analysis and predictions by these authors. The articles are taken from various journals and have been selected from a time span of 4 years i.e. 2014 to 2017. This helps in providing an overview in the evolution of cryptocurrencies over the years. These articles help me in analysing and fulfilling the objectives of this study. The predictions and analysis made by these authors has been properly studied and would be used in this study to predict the future for these cryptocurrencies.

Naran Nayak, Dhvani Kotak, Lynette D'mello (Naran Nayak, 2014) analysed in their paper the scope of cryptocurrency model being incorporated in the monetary system of a nation. Eli Dourado and Jerry Britto (Britto, 2014) analysed using statistical tools whether cryptocurrency can replace normal commodity currency. Sarah Meiklejohn, Marjori Pomarole, Grant Jordan (Sarah Meiklejohn, 2014) has done an empirical research on the usage of bitcoin wallets by characterising longitudinal changes using scales. Siddharth Rao (Rao, 2014) has analysed in his paper the various aspects of bitcoin to make it better. For this purpose, the author has adopted an exploratory model by including Fair exchange protocol.

To analyse the Impact of bitcoin on a society in reference to Dubai, Anu Singhal, Aquila Rafiuddin (Anu Singhal, 2014) has adopted an Exploratory Research Model. Kelly Y Yu (Yu, 2015) has done an exploratory model analysing the various dimensions of Bitcoin to determine the future of bitcoins. For the purpose of understanding how bitcoin emerged as the most successful cryptocurrency and the various challenges faced, Joseph Bonneau, Andrew Miller, Jeremy Clark, Aravind Narayanan, Jos (Anu Singhal, 2014) hua Kroll, Edward W Felten (Joseph Bonneau, 2015) has mapped the design space for cryptocurrency space.

III. RESEARCH GAP & MOTIVATION FOR THE STUDY

It is identified that there are more than 3 million active users of cryptocurrencies. Cryptocurrencies, being a subset of digital currency uses encryption model for the purpose of any transaction. In a world where we are moving towards decentralised financial instruments, cryptocurrency plays a major role. This model of currency also uses blockchain technology to monitor all transactions making it faster and more secure. Thus in a future of immense opportunities, technology and innovation there exist a huge scope for the products under the crypto space. Though there are certain concerns over these currencies taking over the entire economy but physical cash or fiat money is considered to lose its value over in the future and the rise of a new currency is imminent. Thus it raises a larger scope for this study as with a proper advancement and design in the technology, there is a future for cryptocurrencies in the global economy.

IV. METHODOLOGY

A. Primary Objective

- 1) To understand the importance of virtual currencies.
- 2) To analyse if cryptocurrencies can be considered as the future of money in a global economy.
- 3) To analyse the possibilities and opportunities available in the crypto space.
- 4) To analyse if the paper based currency model can be completely eliminated.

B. Exploratory Objectives

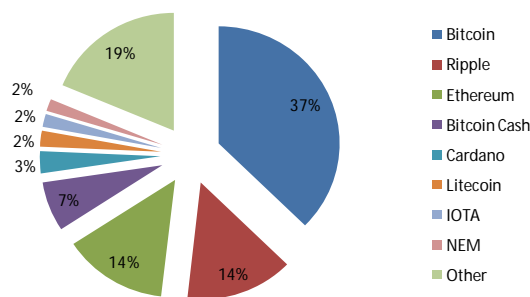
- 1) Exploring the history and milestones of cryptocurrencies.
- 2) Analysing demand and supply.
- 3) Understanding the mining process.
- 4) Analysing various competitors in the crypto space.
- 5) Impact and effects of digitalising the modern economy.

For this research the sample size considered are all the nations who have an exchange specially dedicated for trading cryptocurrencies. This sample size has been considered to analyse various parameters that impact the prices of various cryptocurrencies and also the impact of adopting these digital currencies on a nation. This increases the scope of understanding the future of cryptocurrencies. The data collected for this paper are from various secondary sources. These include data from various crypto exchanges, public documents, IMF reports and many other publicly available documents. This form of data collection method has been used to save time and an immense availability of a large database which was not feasible in case of a primary data collection method. Also this data collection method provides information from across the globe which is critical in this paper. The methodology used in this paper is exploratory research model. This type of research method has been implemented since this field of study has not been fully explored. As the name suggests, in this paper I would like to explore the various opportunities available in the future for crypto space products such as bitcoins. Adoption of exploratory research method increases the probability of understanding the future of these currencies at a global scale. This method also helps in focusing the research in a proper direction and also answers many open ended questions on the opportunities for these currencies in the global market. In this research paper, I explore various unanswered questions and analyse the scope of these currencies in the future.

V. RESULTS FROM THE STUDY

Bitcoin remains the market leader since bitcoin provides innovative features and unique decentralised payment options. Bitcoin has maintained its market leadership since the past but has lost its market dominance. In the year 2015, bitcoin held about 86 percent of the complete market share which now feel to 37 percent by the end of 2017. This raises a concern whether bitcoin would hold its market leadership in the future. Other cryptocurrencies have doubled their market share since 2015. The other cryptocurrency that poses threat to bitcoin from being the market leader in the future are Ethereum, Dash, Monero, Ripple and Litecoin. The total market share of bitcoin over the past 2 years is more than the total market share capital of all the alt coins put together. This leads to the analysis stating that the value of these alt coins is minimum and since it is understood that these cryptocurrencies derive its value from the demand for these currencies, the demand for these alt coins is low and hence can be concluded that these currencies would not be prevalent in the future or would remain dormant since all these currencies are similar to bitcoins but with slight modifications in the nature of the transaction.

MARKET CAPITALISATION



Financial services, investment bankers are interested in the crypto space and thus we can see a huge scope of this currency model in these sectors. This is closely followed by software designers and bankers who are also interested in these currency models and hence paves way for technological advancement and growth in these industries using this model. Employment opportunities in this space have been increasing tremendously and hence is one of the key communities that are interested in the crypto space.

A study on the number of users, it has been found that the number of male users is 97 percent of the entire population of users in the entire market. Majority of the people who used these crypto currencies were between the age of 24 and 34. These age group users covered around 46 percent of the total users in the market. Closely behind, the age group of 35 to 44 had around 31 percent of the total users. Age groups between 18 to 24 and 45 and above shared the remaining 23 percent of the users in the crypto space.

Security levels in small exchanges are greater than the security level in large established exchanges. 20 to 50 percent of employees working in small exchanges are more than the workers working in large exchanges. Also in 74 percent of the large scale exchanges in the world, only less than 10 percent of the employees are working for the security reasons for these exchanges.

Budget allocation in the small scale exchanges is seen much higher than that of the large scale exchanges. It is observed that budget allocated is 40 percent higher than the budget allocated to the large exchanges for the purpose of security.

79% of the crypto exchanges train their staff in order to ensure the efficiency of these employees. These factors to a major extent increases the trust of the users on these exchanges as this improves the security, reliability and accuracy of the transactions.

Wallet users are more in US when compared to all other nations in the world. Majority of the wallets provided are by the registered corporations. A quick analysis into the market projects that almost 85 percent of the wallet providers are registered and the remaining 15 percent are volunteer projects. Another in-depth analysis states that there are averages of 19 employees per wallet provider in the industry.

86 percent of the total cryptocurrency transactions are conducted using bitcoins. The next most used currency for making a payment is Ripple followed by the traditional paper network. This analysis also states that along with being one of the largest traded and most valued cryptocurrency, bitcoin also is the mostly traded cryptocurrency.

Level of difficulty in mining new currencies have increased exponentially and this leads to further analysis whether the difficulty in mining of new crypto currencies would impact the number of currencies or the supply of these currencies in the future. Reduction in the supply will cause the price of these currencies to increase and this would in turn increase the demand for these currencies. Due to lack of currencies available in the crypto space and unable to cope up with the demand for these currencies, these currencies will lose its value and the crypto bubble will be formed.

Miners who are adequate and experienced are only 27% out of all the existing miners across the globe. More than 60 percent of the miners existing are either not qualified or experienced. This leads to the fact that it encourages or attracts more hackers and illegal activities since the currencies are not mined and leaves an opportunity for the illegal users to replicate or steal the data of the currencies mined. Hence we can conclude that we can expect huge job and career opportunities in these crypto spaces in the near future.

Majority of the mining pool existing across the globe is in china. 58% of the mining pools available in the world are located in China and almost 16% is located in US. This leads to a further analysis on why US leads in the world on the numbers of currency mined and on the number of users of these currencies. Further research have been made by various researchers and it is analysed that most of the pools available in the Middle Asian nations have not yet been completely explored and hence has huge potential in the future as the demand for these cryptocurrencies will increase. The shortage of these currencies across the world would impact the demand and price of these currencies. Having the highest pool of unexplored resources in these nations, these nations would tend to be the key suppliers of crypto currencies in the future.

Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_5 + \beta_5 X_6 + \beta_6 X_7 + \beta_7 X_8 + \beta_8 X_9 + \beta_9 X_{10} + \beta_{10} X_{11} + \beta_{11} X_{12} + \beta_{12} X_{13} + \beta_{13} X_{14} + \beta_{14} X_{15} + \beta_{15} X_{16} + \beta_{16} X_{17} + \mu$$

Adoption rate	=	Y
Employment in industry (% of total employment)	=	X ₁
GDP per person employed (constant 2011 PPP \$)	=	X ₂
Foreign direct investment, net inflows (% of GDP)	=	X ₃
Gross savings (% of GDP)	=	X ₄
GNI per capita growth (annual %)	=	X ₅
GDP per capita growth (annual %)	=	X ₆
Trade (% of GDP)	=	X ₇
Gross capital formation (% of GDP)	=	X ₈
Taxes on international trade (% of revenue)	=	X ₉
Real interest rate (%)	=	X ₁₀
Lending interest rate (%)	=	X ₁₁
Inflation, consumer prices (annual %)	=	X ₁₂

Consumer price index (2010 = 100)	=	X ₁₃
Broad money growth (annual %)	=	X ₁₄
Stocks traded, total value (% of GDP)	=	X ₁₅

MACRO ECONOMIC VARIABLES	INDIA	CANADA	AUSTRALIA	USA
Employment in industry (% of total employment)	-	+	+	+
GDP per person employed (constant 2011 PPP \$)	-	-	-	-
Foreign direct investment, net inflows (% of GDP)	-	+	+	-
Gross savings (% of GDP)	+	+	+	+
GNI per capita growth (annual %)	-	+	-	-
GDP per capita growth (annual %)	-	+	-	-
Trade (% of GDP)	+	-	+	+
Gross capital formation (% of GDP)	+	+	+	+
Taxes on international trade (% of revenue)	-	-	-	-
Real interest rate (%)	-	-	+	+
Lending interest rate (%)	+	+	+	+
Inflation, consumer prices (annual %)	+	-	+	+
Consumer price index (2010 = 100)	-	-	-	+
Broad money growth (annual %)	+	+	+	-
Stocks traded, total value (% of GDP)	-	-	-	-

The above table shows us the impact analysis of various macro economic factors on the adoption rate of crypto currencies.

VI. CONCLUSIONS AND DISCUSSIONS

The model formulated has been used to analyse the adoption rates in India, Australia, Canada and USA. Based on the study it is evident that most of the macro economic variables are favourable to the adoption rates in Canada, USA and Australia. In India the macro economic factors have no impact or minimum impact on the adoption rates. This is related to the fact that most of the macroeconomic policies formulated by the government are not favourable for changing the economic structure of the nation from a paper based currency model to a virtual or digital space currency. The future of cryptocurrencies cannot be substantiated accurately as most of the Governing agencies around the globe are not willing to lose their control over the economic system of a nation

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