

An Empirical Three Phase Analysis of Crypto Market

Aditya Thakur¹, Rahul Verma²

¹PG – Economics, Chandigarh University, Punjab

²UG – Mechanical Engineering, Vellore Institute of Technology, Tamil Nadu

Abstract

This paper provides an in-depth analysis of cryptocurrency, especially bitcoin. This research also covers the development and growth of cryptocurrency over the last 12 years. An increase in number of block chain wallet users from year 2011 to 2022 is provided graphically. It was also reported that the market capitalization of crypto market increased rapidly and is given in this paper. Ranking list of top five countries with highest number of crypto users is an additional asset in this research. The prime focus of this research is to carry out three phases analysis of bitcoin in pre-covid phase, covid phase and post-covid phase. The price trend of bitcoin is given for both post-covid and covid phase graphically. Post-covid phase includes an estimate the behavior of bitcoin price in the upcoming years. This estimate is provided on the basis of mathematical calculations, its price trend in previous years and future investments. This paper also tried to provide an approximate value of bitcoin by the end of financial year 2024.

Keywords: Bitcoin, Crypto market, Crypto currency and Covid 19

1. Introduction

We are living in a world where development is increasing at an enormous rate. Every day world is changing and it can provide us with more opportunities for new experiences and knowledge. The present technologies allow us to pay bills with our phones in just one click, rather than going to the bank to do so. As we began to get used to it, an entirely new phenomenon in the name of “digital currency” emerged. Digital currency has become a new concept that needs our understanding and advancement (STEPANOVA, D. I. 2018). The idea of cryptocurrency is a newly emerging phenomenon that has been receiving noticeable attention from media and investors. Over the past few years, the cryptocurrency market has grown rapidly. History of cryptocurrency can be dates back to the 1980s under the title of “Cyber

currencies”. With the introduction of bitcoin in 2009, the popularity of these coins increased. Bitcoin was the first decentralized cryptocurrency which was created in 2009. There were lot of additional cryptocurrencies released after that, and they were referred to as altcoins, since they represented a mix of Bitcoin alternatives (Lubyanskiy, A. M. 2017).

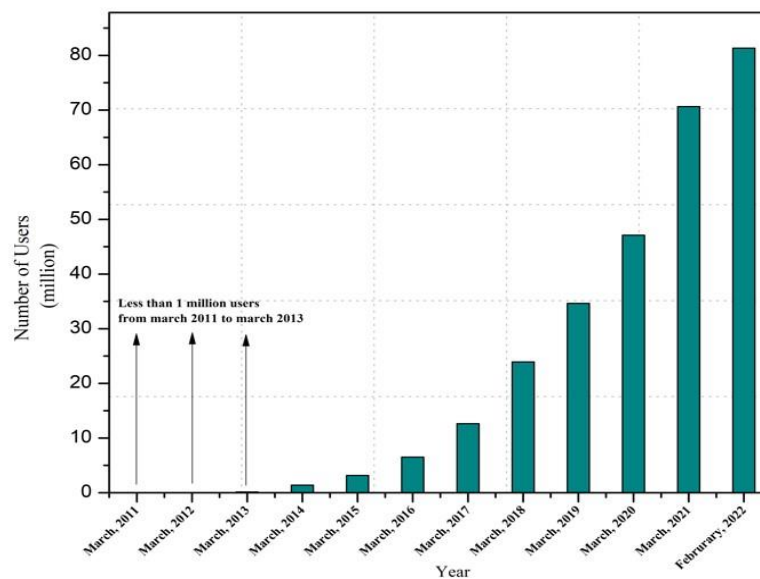
Digital Money is a form of currency that you can't feel, and hold in your hands. It is a currency that can be obtained electronically or digitally and is also called electronic money, or cyberscash. As digital currencies do not have any physical attributes, it is very confusing for a

lot of people to understand the aspects of cryptocurrency, especially for those people who are unable to keep up with all the changes that technological advancement has brought to us. Payments in traditional economy relies entirely on third-party financial institutions (such as banks) in the form of cash or electric funds transfer. These financial institutions act as an intermediate between the parties involved in exchange of funds and have complete control over the transactions (Mikhaylov, A. 2020). While financial transactions can be initiated easily, only a limited amount of money can be transacted along with the disadvantage of less trust, flexibility, transparency, and security. These issues can be overcome by a system that enables financial transactions between parties without the involvement of any middleman, which would dramatically alter the way the economy works.

Unlike printed banknotes and minted coins, digital currency does not have a physical form. Its nature of being digital not only allows instantaneous online transactions, but also removes the cost associated with the distribution of notes and coins (Abdullah, A., & Mohd Nor, R. 2018). Due to the fact that digital currencies exist only in electric form, they can only be accessed by computers, mobile phones, or electronic wallets connected to the internet or any other designated network. Since they have no intermediaries, these are one of the cheapest methods to trade currencies without any national border restrictions (Farell, R. 2015). Like any standard currency, digital currency can be used to purchase goods as well as pay for services. Cryptocurrency essentially is a digital money that can be bought and sold online using various wallets and exchange platforms. Cryptocurrency does not have bills or coins and it does not need to be transferred through traditional financial institutions like banks. People invest in cryptocurrencies in the same way as other assets such as stocks or precious metals. In order to manage seamless operations of these currencies, an extremely popular decentralized system known as “Blockchain Technology” is used (Milutinović, M. 2018). Like the name indicates a blockchain is a chain of blocks that contains user information. This technique first came into existence in 1991 by a group of researchers and was originally intended to timestamp digital document which makes them impossible to backdate or temper almost like a notary (Böhme, R. et al. 2015). The concept of P2P cash transfers of online payments without the involvement of any intermediate financial institutions was revealed in 2008 by an anonymous researcher named Satoshi Nakamoto in a Paper entitled “Bitcoin: A peer-to-peer Electronic Cash system”. However, it went by mostly unused until it was adapted by Satoshi Nakamoto in 2009 to develop the first ever digital cryptocurrency named “Bitcoin” (BTC) (Nakamoto, S. 2008). Blockchain is a distributed ledger that can accessed by anyone from any part of the globe. Once the data is recorded inside a block, it becomes extremely difficult to bring any further alterations

in that data. Coins are developed by solving complicated mathematical problems using computational power through a process called “Mining”. It is the process which introduces new bitcoin into the circulation and it takes nearly 10 minutes to mine one bitcoin. Whenever the first computer solves a problem, it receives the next block of bitcoin and the process repeats itself. The price of the cryptocurrency solely depends upon the demand and supply of the market. Higher the demand higher will be the price and vice-versa. At present, there are hundreds of digital currencies on various exchange platform apart from bitcoin. While, bitcoin gets all the attention when it comes to cryptocurrencies, there exist various options such as Ethereum, Ripple, Monero, Stellar, Dash, Tether, Cardano, Solana, Litecoin etc. which are gaining popularity steadily because of their appealing performance. It has been observed that cryptocurrency experienced significant increase in its value over the last four years. Data have reported that the users of blockchain wallet reached over 81 million till February 2022 and is increasing day by day. An increase in blockchain wallet users from 2011 to 2022 is shown in Fig. 1. It can be observed from the figure that the blockchain users are less than one million from 2011 to 2013, but has linearly increased to reached at the mark of 80 million

Fig. 1: Number of Blockchain wallet users worldwide

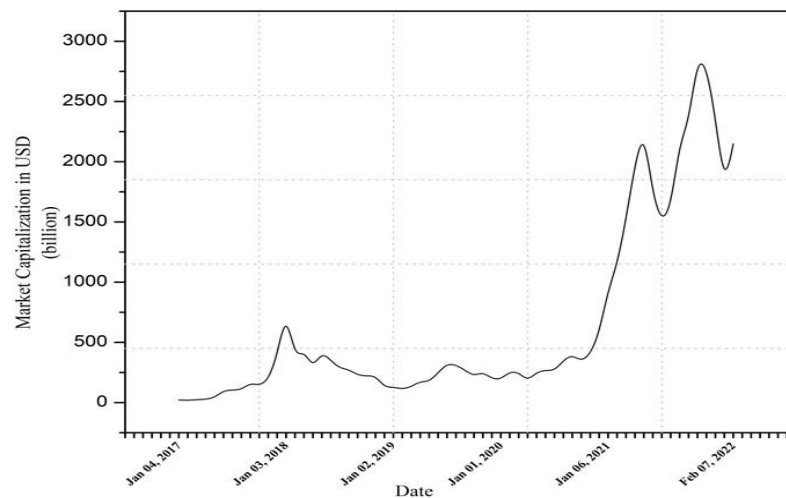


Source: Statista 2022

The price of bitcoin increased from nothing in 2008 to \$20,089.00 in 2017 which was the highest price ever recorded in its history. Despite of the crash in crypto market at the end of 2017, bitcoin prices have not dropped below \$3000. Several cryptocurrencies apart from bitcoin have been created since 2009, and as of February 2022, there will be almost 10,000 cryptocurrencies are there in the market. By February 2017, the total market capitalization of crypto market increases beyond USD 19 billion. The year-wise market capitalization of all cryptocurrencies in billion US dollars is shown in Fig. 2. From Fig. 2, it is evident that the first

increase in market capitalization occurred in December 2017 followed by significant bearish trend. This paper provides price prediction of bitcoin by using previous statistical data and current market situation.

Fig. 2: Cryptocurrency market capitalization per year



Source: Statista 2022

2. Background Data

Cryptocurrency have become a center of attraction for significant number of users and investors worldwide. In addition to its characteristics such as decentralization, immutability, and security, cryptocurrency seems to have a promising future. They facilitate secure online payment without requiring third-party intermediaries. It was observed that the prices of bitcoin have been intensively fluctuating since past few years. It is reported that the price of bitcoin increased from \$1,000 in January to almost \$20,000 on 17 December 2017 which is 20-fold increase in less than a year, a new high record of that time (Chohan, U. W. 2017). The main reason behind this rise was its gradual awareness into the general public. Another major reason behind sudden increase in the price of bitcoin was extremely high volume of investments into the crypto market. By 5th February 2018, a drop of 50% in its value was seen in just 16 days (See fig. 2) which caused the price of bitcoin to fall below \$7000 as China banned the trading of bitcoin. During the first half of 2018, the price of bitcoin fluctuated between \$11,480 and \$5,848 and after that the price of bitcoin has reflected small bursts of activity until the start of the COVID-19 pandemic. During the emerging pandemic situation in March 2020, crypto market experienced large fluctuations. Over a course of one month, it went from over \$10,000 in February 2020 to below \$4,000 in March 2020. After March 2020, bitcoin was again back to trading at \$5,000 and its value increased by nearly 300 % in the financial year 2020 (Peterson, T. 2020). By the end of December 2020, bitcoin reached a record high value of more than \$30,000. A second bitcoin boom occurred in early 2021, with its price increasing over 700% since march 2020. In the first quarter of 2021, price of bitcoin reached its highest level ever of

\$64,800. The price of Bitcoin the dropped to \$30,000 on 19 May 2021, after it is reported that Tesla sold or will be selling its bitcoin holdings, and would suspend payments using bitcoin due to environmental concerns, along with another negative statement delivered by the People’s Bank of China stating their intentions of banning crypto exchange platforms.

In 2021, cryptocurrency statistics estimated that the average ownership rate of cryptocurrency was 3.9%, which implies that there are more than 300 million people worldwide using cryptocurrency. Table 3 shows the top five countries with most crypto owners from financial year 2019 to 2021. It can be clearly seen that Nigeria has the highest number of cryptocurrency users, mentioned they either own or use a digital coin (Reid, F., & Harrigan, M. 2013). In addition, a total of 18,000 companies accept cryptocurrency as a mode of payment for their product or services. It is also believed that cryptocurrency comes in more than 6000 varieties, and there are over 200 cryptocurrency exchanges. Studies have reported that approximately 79% of cryptocurrency owners in the United Kingdom have invested in the bitcoin at some point of their lifetime (Crosby, M. et al. 2016). As the value of bitcoin dropped around 10% since the start of 2022, the entire crypto market is struggling to recover the lost ground. Experts have analyzed technical data and expressed opinions about bitcoin price prediction for 2025, which reports that the BTC will reach \$129k in the first quarter followed by \$121k, \$131k and \$185k in the second, third and last quarter of 2025, respectively. In this paper, we have provided a detailed analysis of bitcoin in three different phases: (i) Pre-covid phase; (ii) Covid phase; and (iii) Post-covid phase.

Table 3: Countries with most crypto owners from 2019 to 2021

Countries	2019	2020	2021
Nigeria	28%	32%	42%
Thailand	23%	18%	31%
Philippines	15%	20%	28%
Vietnam	22%	21%	27%
Turkey	20%	16%	25%

Source: Statista

3. Results and Discussion

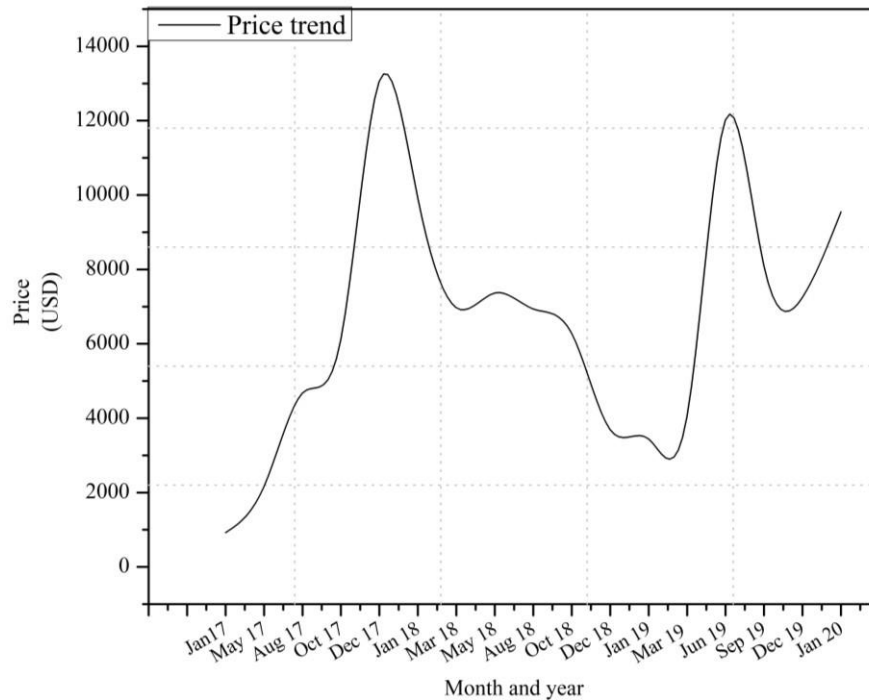
Cryptocurrency is a digital currency that is traded through computer networks. Bitcoin is one of the oldest and most dominating currency in the crypto market. It is a decentralized digital currency that is not controlled by any central bank or administration, allowing its easy transfer from user to user on the peer-to-peer bitcoin network without third party involvement. There is

a limit of 21 million bitcoins available for mining, among which 19 million have already been mined and it is estimated that the remaining 2 million bitcoins will be mined by 2040. User also have the provision to convert bitcoin into cash by using a third-Party exchange broker (such as bitcoin ATMs and Debit cards) or peer-to-peer transaction to sell bitcoin. The main characteristics of cryptocurrencies such as its self-protecting nature from bank failures, hyperinflations, un-hackable and non-manipulative security codes are the reason behind its tremendous success. Development of any crypto currency is solely based on the background mathematical codes used to generate block chains and not on any physical asset or government body. The value of bitcoin is determined and extracted directly from the fact that whether or not people are willing to accept it as a mode of payment, just like any other currency. Fluctuations in the prices of bitcoin is experienced under some of the following factors such as its demand and supply in the market, market competition and its cost of mining. Cost of mining is different in every country depending upon the cost of electricity, working conditions and government taxes. The prime focus of this research is to analyze every single aspect related to the behavior of bitcoin. To provide clear understanding, analysis of bitcoin is divided into three phases which are: (i) pre-covid phase; (ii) Covid phase; and (iii) post-covid phase.

1.1 Pre-covid phase

In Pre-covid phase, we have considered the time period from January 2017 to 2020 and a graph is plotted showing its price trend during this period in Fig. 3. While it was noticed from the price trend that the value of bitcoin in was near to \$1000 by the end of first quarter of 2017, its value jumped to \$19,783 by the end of 2017. This transition in the value of bitcoin occurred due to high volume investments from renowned institutions, various investment schemes and trusts. Bitcoin being a topic of interest in 2017 provoked media to enlighten the significance of entire crypto market (Barlin, R. 2017). The year 2017 was believed to be the landmark year for bitcoin and bitcoin investors managed to receive enormous profit due to its year-long bullish nature. However, a strong trend reversal was observed in fig. 3 in December 2017. It is believed that investors withdrawn their entire crypto holdings causing its demand to fall abruptly, resulting into tremendous decrease in its price. It can also be clearly observed from the graph that the price of bitcoin continues to drop throughout 2018 (Holub, M., & Johnson, J. 2019).

Fig. 3 Trend behavior of bitcoin from 2017 to 2020



Source: Statista

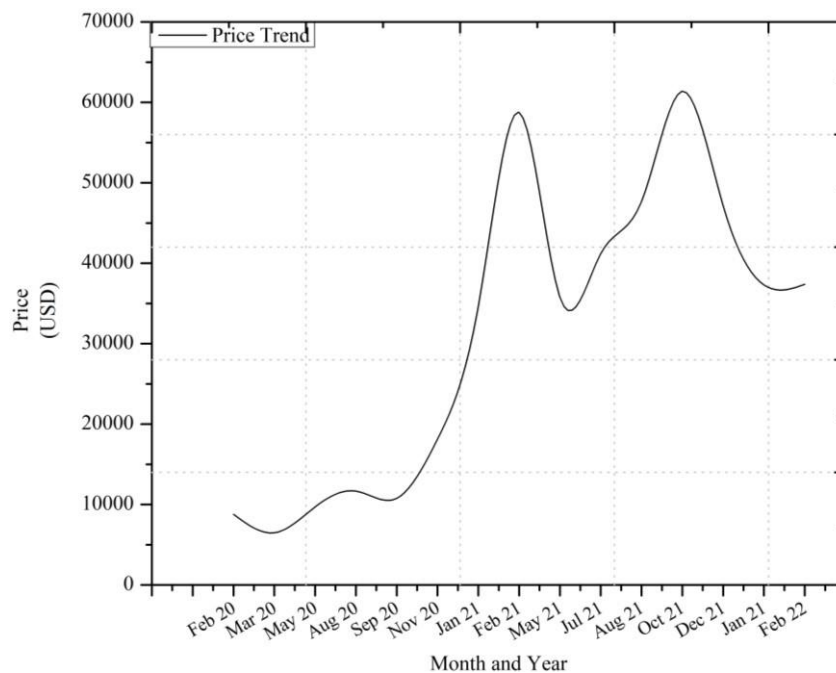
Various studies have reported that the reason behind strong fall of bitcoin in 2018 was the hacking of Coincheck, which involved a theft of 530 million USD of the New Economic Movement (NEM). Moreover, regular decrement in the price of bitcoin was observed till March 2019 which was due to the imposed restrictions on the advertisement of bitcoin on various popular social platforms such as google, facebook and twitter. It is also seen that in June 2019, BTC price exceeded \$10,000 which then plummeted to \$6,635.84 by midDecember. In financial year 2017-18, countries like Algeria, Egypt, Morocco, Bolivia, etc. implemented an interpolate ban on the mining of cryptocurrency which may also be the reason for excessive drop in the price of bitcoin.

1.2 During COVID-19

In March 2020, WHO declared COVID-19 as a global Pandemic because it had negative impacts on the global health system. According to market analysis carried out by experts, it was estimated that at least 4.5% of the global GDP might drop during the pandemic in 2020. Total global GDP in 2020 was estimated around 84.54 trillion U.S. dollars which implies that a decline by 4.5% might results into a loss of almost 2.96 trillion U.S. dollars. While the effect of Covid-19 pandemic to stock market was quite obvious to researchers, behavior of crypto market was the main issue of concern (Pano, T., & Kashef, R. 2020). Fig. 4 and 5 provides price trends of bitcoin and US stock market (DJIA analysis), respectively. As predicted by experts, US stock market fall down nearly 10000 points in one month resulting into stock market to stand at 19173 points at the end of March 2020. However, market started slow crawl in the upward direction

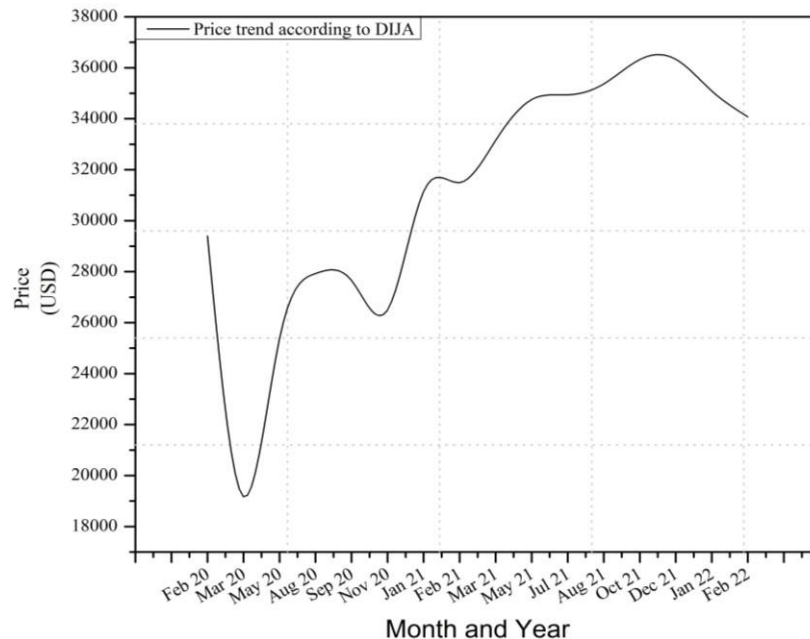
in April 2020 which was a result of increasing share values of various pharmaceutical industries. From fig. 4 it can be clearly noticed that the price of bitcoin started to climb up from March 2020 (\$6483) and surpassed \$11,000 in August 2020. However, bitcoin performed exceptionally throughout 2020, resulting into its value reaching at nearly \$60,000 in April 2021 which is roughly 550% more than its value in August 2020.

Fig. 4 Price trend of bitcoin during pandemic



Source: Statista

Fig. 5 Price trend of US Stock market (DJIA)



Source: DJIA

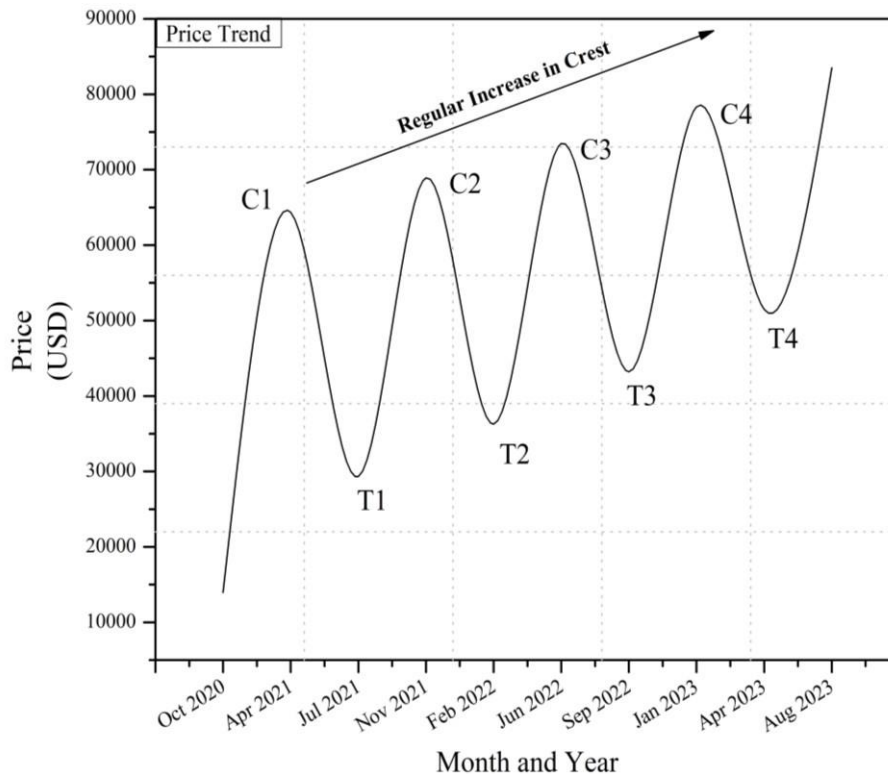
While the value of bitcoin increased by more than 800% from March 2020 to April 2021, the US stock market increased only 44.43%. This reflected that the volume of investments induced in crypto market was extremely large than that off the stock market. However, bitcoin experienced an abrupt decrease till the end of June 2021. This drop is caused due to imposition of ban on more than 100 crypto exchange platforms in China. Moreover, similar to the crypto crash of 2017, investors withdrawn large volumes of crypto assets resulting into the decrease in demand of bitcoin (Kurihara, Y. (2021) (Conlon, T., & McGee, R. 2020). As crypto market works on the principle of demand and supply, the popularity of bitcoin and its tremendous record attracted investors to input high volumes of investments. This resulted into substantial rise in the value of bitcoin crossing its previous record and closing at \$61,374 in October 2021. It can be clearly concluded from fig. 4 and 5 that, while the overall rise in bitcoin from March 2020 to October 2021 is more than 900%, US stock market experience a rise of only 47.22%.

1.3 Post-covid phase

Based on the past price analysis of bitcoin, an approximate future price trend and possible fluctuations are meticulously calculated and is provided in fig. 6. The graph reported estimated highs and lows in the price of bitcoin price. Considering the first crest (C1) of the bitcoin price wave formed on April 2021, it can be seen that the value of bitcoin touched \$64,374. Over a period of three months, the price of bitcoin dropped abruptly forming a trough of the wave (T1) and its price is reported as \$29,341 in July 2021 which reflects a drop of 54.42%. However, it can also be depicted from fig. 6 that the value of bitcoin again started to climb after July 2021.

This resulted into the formation of the second wave crest (C2) which was observed in November 2021 with a highest value of \$68,925. A significant rise of 6.6% between C1 to C2 was the main point of interest in order to predict its future price trend.

Fig. 6 Future price analysis of bitcoin



Starting from November 2021, a continuous drop in the price of bitcoin was observed. While the first trough (T1) was developed in July 2021 valuing nearly \$23,200, second trough (T2) is expected to be obtained in February 2022. Now, that the price of bitcoin is decreased, large number of investments are expected in the crypto market. On the basis of mathematical analysis and considering similar rise of 6.6% between C2 and C3, it was found that the price of bitcoin might reached at \$73,474 by the end of second quarter of 2022, followed by its substantial decrease inducing the formation of T3. Our analysis states that the value of bitcoin might reach \$43,222 (T3) by the end of third quarter of 2022 which is 41.17% less than C3. On the basis of this approximation, similar price trend is expected and is provided till August 2023 in fig. 6. Broadly speaking, if the peak price (crest) of bitcoin continue to rise by 6.6% in every six months followed by a subsequent drop by some percentage, the price of bitcoin will be able to cross \$100,000 by the end of 2024. Moreover, various other cryptocurrencies such as Solana, Ethereum, bitcoin cash, Cardano, etc. are also performing tremendously and might be an extremely profitable future investment.

4. Conclusion

This paper provided an overview of the working, development and behavior of crypto currency. The growth in crypto market was clearly observed from the graphical representation of blockchain wallet users worldwide. It was also observed that the market capitalization of cryptocurrency has increased rapidly in the last few years. A list of top five countries given in this paper from year 2019 to 2021 shows that Nigeria has the highest number of crypto owners followed by Thailand, Philippines, Vietnam and Turkey. The three-phase analysis of bitcoin conducted in this research provided graphical representations of its price trend for precovid and covid phase. Mathematical calculations carried out to estimate future price behavior of bitcoin shows that bitcoin might reach at \$73,474 by the end of 2022. Also, it was estimated that if current growth rate in bitcoin continues, its price will be able to cross \$100,000 dollars by the end of 2024.

References

- STEPANOVA, D. I. (2018). Factors of development and use of crypto currency. *Мировая экономика: проблемы безопасности*, (1), 82-85.
- Lubyanskiy, A. M. (2017). Dynamics and prospects of the cryptocurrency development in the modern global financial system. *Modern Science*, (6-1), 67-70.
- Mikhaylov, A. (2020). Cryptocurrency market development: Hurst method. *Finance: Theory and Practice*, 24(3), 81-91.
- Abdullah, A., & Mohd Nor, R. (2018). A Framework for the Development of a National Cryptocurrency. *International Journal of Economics and Finance*, 10(9), 14-25.
- Farell, R. (2015). An analysis of the cryptocurrency industry.
- Milutinović, M. (2018). Cryptocurrency. *Економика-Часопис за економску теорију и праксу и друштвена питања*, (1), 105-122.
- Böhme, R., Christin, N., Edelman, B., & Moore, T. (2015). Bitcoin: Economics, technology, and governance. *Journal of Economic Perspectives*, 29(2), 213-38.
- Nakamoto, S. (2008). Bitcoin: A peer-to-peer electronic cash system. *Decentralized Business Review*, 21260.
- Chohan, U. W. (2017). A history of bitcoin. Available at SSRN 3047875.
- Peterson, T. (2020). To the moon: a history of Bitcoin price manipulation. *Journal of Forensic and Investigative Accounting*, 13(2).
- Reid, F., & Harrigan, M. (2013). An analysis of anonymity in the bitcoin system. In *Security and privacy in social networks* (pp. 197-223). Springer, New York, NY.
- Crosby, M., Pattanayak, P., Verma, S., & Kalyanaraman, V. (2016). Blockchain technology: Beyond bitcoin. *Applied Innovation*, 2(6-10), 71.

- Barlin, R. (2017). Regulation on the rise as bitcoin gains popularity. *The CPA Journal*, 87(6), 10-11.
- Holub, M., & Johnson, J. (2019). The impact of the Bitcoin bubble of 2017 on Bitcoin's P2P market. *Finance Research Letters*, 29, 357-362.
- Pano, T., & Kashef, R. (2020). A complete VADER-based sentiment analysis of bitcoin (BTC) tweets during the era of COVID-19. *Big Data and Cognitive Computing*, 4(4), 33.
- Kurihara, Y. (2021). Has the Price of Bitcoin changed during COVID-19. *Journal of Economics and Finance*, 12, 1-6.
- Conlon, T., & McGee, R. (2020). Safe haven or risky hazard? Bitcoin during the COVID-19 bear market. *Finance Research Letters*, 35, 101607.