

Analysis of the Current Situation of Virtual Currency Based on Statistical Data and Prospects for Its Future Model

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Abstract. Bitcoin is known to the world from its birth to the present, and it only took 13 years. In the past 13 years, countless virtual currencies have flourished. In the rapid development of virtual currencies, many problems have been revealed. This article will mainly discuss (1) energy consumption, (2) miner consolidation, (3) encryption security and finally (4) miner income volatility through different types of virtual currency data. And use Android virtual currency as a case to look forward to virtual currency The direction of development. Readers can learn more about the main challenges faced by virtual currencies through this article, and explore the future development model of virtual currencies.

Keywords: Cryptocurrencies, Energy Consumption, Miner Consolidation, Encryption Security, Miner Income Volatility.

1. Introduction

In the year 2008, Satoshi Nakamoto who was not known to the entire world invented the very first cryptocurrency on planet earth; Bitcoin. Bitcoin cryptocurrencies was first officially used in the year 2009 when the founder (Satoshi Nakamoto) successfully implemented an released the very first Bitcoin open-source software code. Ideally, bitcoin is a virtual currency that is as a reward of the comprehensive process called cryptocurrency mining. Virtual currency or cryptocurrencies are currently an international phenomenon and now more than ever more and more people are increasingly learning about blockchains and cryptocurrency but there is still much to be learned about virtual currencies, the safety of cryptocurrency, how it's applicable in real life transactions and why virtual currencies are the future of financial transactions (Killian, 2019).

Moreover, there are several worries and concerns revolving around blockchain technology, cryptocurrencies and the inherent ability to disrupt the traditional conservative financial systems. The challenges of cryptocurrencies revolve around four main pillars: (1) energy consumption, (2) miner consolidation, (3) encryption security and finally (4) miner income volatility. future of cryptocurrencies and the long-term outlook of the virtual currency is a current issue that is still debatable. Finally, the future of cryptocurrencies will be dictated by smart, innovative and creative projects like the new Pi Network cryptocurrencies that aims to revolutionize the industry of virtual currencies by solving the challenges due to mining the current cryptocurrencies like: Ethereum, Bitcoin, Bitcash among others (Killian, 2019).

2. Background

2.1. Advantages of virtual currency

From 2008, cryptocurrencies or virtual currency have gone through significant revolution and advancements to a globally accepted tool that may be used in the place of fiat money. Bitcoin or cryptocurrencies have numerous advantages over fiat currency. Some of the advantages or merits of cryptocurrencies include: (1) its decentralized blockchain system, (2) increased security and privacy for all the virtual currency users and finally (3) cheap a very fast financial transaction through the blockchain network.

2.2. Current Situation

The process of mining cryptocurrencies may be viewed as a costly and painstaking activity that sporadically rewards the miners. Despite this, cryptocurrency mining has an inherent appeal to most of the virtual currency investors because the Cryptocurrency miners are usually rewarded with virtual currency tokens. Some of the current cryptocurrencies mined in the financial market include:

- Bitcoin
- Bitcash
- Ethereum
- Dodge Coin among others.

The increase importance and prevalence of cryptocurrencies has significantly increased ever since the successful introduction of Bitcoin by Satoshi Nakamoto in the year 2008 about ten years ago. Currently, the virtual currency industry has about 1,000 others different cryptos and the cumulative market cap for the virtual currency industry is estimated at \$750 billion. The critical or core components of virtual currencies is the process of transaction verification through the cryptocurrency mining. However, mining cryptocurrencies currently faces significant challenges that must be solved for the future of virtual currencies to be bright and for the growth of cryptocurrencies to be significant. The future of cryptocurrencies will mainly focus on addressing four main or core challenges experienced by cryptocurrencies include: (1) miner income volatility, (2) encryption security, (3) miner consolidation and (4) energy consumption.

Currently, Bitcoin still remains to be the founding cryptocurrency in the entire globe. Additionally, Bitcoin also remains to be highly inaccessible to most of the users who desire to venture into the cryptocurrency sector. This is due to the fact that for the users to mine Bitcoin, they require sophisticated digital mining tools that require a lot of technological know-how and skills for them to participate in the Bitcoin network. This presents significant challenges because mining bitcoin is an energy intensive activity that results in a lot of carbon emission that uniquely result from the energy consumed during the prices of mining cryptocurrencies the effects or implications due to the energy intensive process.

Additionally, Bitcoin's consensus on proof-of-work protocol is a technological process that heavily relies on the underlying nodes using a lot of electricity because every miner competes with other miners to be the very first one to solve the complex mathematical equation that results in new bitcoin cryptocurrency token. Contrary to Bitcoin, other creative cryptocurrency concepts or projects like the Pi Network and Electroneum Cryptocurrencies that may be mine using android smart phones are strictly built on the SCP also Stellar Consensus Protocol that uniquely relies on the direct involvement of different nodes that vote on the validity of the transactions on the Pi blockchain network. In the Stellar Consensus Protocol, the desired communication that is entailed for the nodes to effectively come into consensus requires minimal computing power.

“Bitcoin’s proof-of-work consensus protocol relies on nodes using lots of electricity in competition to be the first to solve a math equation,” McPhillip explained. Pi, on the other hand, is built on the Stellar Consensus Protocol (SCP), which “depends on the involvement of several nodes to ‘vote’ on transaction validity,” he said. “The communication entailed for nodes to come to consensus requires far less computing power.”

In the medium to long term, Bitcoin has broken through the top of a falling trend channel. This suggests a slower initial fall rate or the beginning of more horizontal development. The moving average indicator has given the currency a bullish signal, indicating that it will increase further. The money has 30000 points of support and 62000 points of resistance. A positive volume balance suggests that buyers are active while sellers are quiet, therefore strengthening the currency. A reading of the RSI over 70 indicates that the money is gaining strength in the short term. Investors have gradually paid more to purchase the currency, indicating growing optimism and the likelihood of raising the price.

A reading of the RSI over 70 indicates that the currency has a strong bullish momentum in the immediate term. Investors have gradually paid more to acquire the currency, indicating growing hope that the price would climb further. However, especially for large equities, a high RSI may indicate that the stock is overbought and that there is a possibility of a negative response. Overall, the currency is seen as technically neutral in the medium to long term.

3. Challenges of Current Cryptocurrency

3.1. Miner income volatility

In February 2021, Tesla managed to successfully purchase Bitcoin cryptocurrencies worth about \$1.5 billion. This significantly pushed for a rapid increase in the value of Bitcoin and pushing the price to an all-time \$57,000. This was a significant step as cryptocurrencies enthusiasts and experts cheered this move as an important indicator in showing how Bitcoin is increasingly growing and having its mark on the formal financial economy (Lambert & Hacket, 2021).



Figure 1. Showing the volatility in the value of Bitcoin (virtual currency).

Similar to other financial instruments, the interpretation about the value of Bitcoin is strictly based on facts, hope and how others perceive the value of the coin will eventually become. However, Bitcoin and other cryptocurrencies like Ethereum have failed to live Upton the expectations and hopes about the true value of the coin and that cryptocurrencies would go a long way in democratizing the financed system through enabling secure payments, instantaneous payments and affordable nor cheap payments that

could be effectively conducted without the reliance of the traditional financial institutions like credit card firms and banks.

It is clear that Bitcoin has failed to meet its expectations and vision because of the difficult or challenging user experience because the Bitcoin users who lose their passwords end up losing explicit access to their earned bitcoins. Moreover, the slow Bitcoin transactions, excessive Bitcoin price volatility and the increased concentration of bitcoins with about 1,000 users holding about 40% of the total bitcoins in the financial market being some of the major challenges affecting the current cryptocurrencies or virtual currencies.

Other financial experts have also questioned whether the social value of the virtual currencies like Bitcoin and Ethereum matches the actual value of the currencies. Therefore, it is prudent to conclude that Bitcoin will continue to remain just another speculative asset like gold, oil, commodities, Beanie Babies and tulips.

However, unlike other traditional financial assets like gold, oil, commodities among others, Bitcoin introduces unique harms and risks into the financial sector. Through its pseudo-anonymity security feature, the users of Bitcoin are anonymous which is a significant threat that might eventually drive illicit finance through the anonymous cash values that are sent between users.

3.2. Energy consumption

Additionally, since new cryptocurrencies are uniquely created through a complex computational process that is commonly known as cryptocurrency mining, the entire cryptocurrency sector or world had been directly linked to increased energy consumption which is one of the major issues affecting the then global energy conservation initiatives.

Recent assumptions and estimates by Digiconomist have revealed that the total energy that is utilized by Bitcoin mining significantly ranges from 75 to 140 terawatt hours also TWH annually. This is due to the fact that the source code that underlies the Bitcoin or cryptocurrency network only allows for a certain number or number of bitcoins to be created at different ranging intervals. The current rate of the bitcoin is set at about 6.251 bitcoins at every minute which further results in significant power increases because of the rate at which the computers are required to work across the globe to produce similar values or amounts of Bitcoin.



Figure 1. Showing the volatility in the value of Bitcoin (virtual currency).

As revealed in the above diagram (please see figure 1 above), the entire bitcoin network has sparkingly high energy requirements and needs. In May 2018, it was projected that Bitcoin mining consumed around 2.6 gigatonnes of power per day; however, this figure has since grown to more than 5 gigatonnes of electricity per day and may possibly rise to 7.7 gigatonnes of electricity per day by the end of the year. In reality, Bitcoin mining currently accounts for roughly 1% of global power usage and consumes the same amount of energy as gold mining. Mining's energy consumption has now grown to the point where it has a quantifiable influence on overall world energy consumption and greenhouse gas emissions. This is causing worry among miners and the global society, and it is believed that action is required to address this problem. Although more energy generating is being built, supply will struggle to keep up with demand unless efficiency is also enhanced. In this looming global reality, companies that utilize huge quantities of energy will almost certainly face intense scrutiny and, maybe, punitive actions from authorities and worried citizens. If bitcoin mining continues to consume energy at its present rate, it is extremely likely that it will be one of the businesses subject to inspection and punitive actions. At the same time as energy consumption is growing, there is a determined worldwide push to find greener energy sources. The demand for ecologically responsible energy usage will put pressure on companies to solely use clean energy sources. Cryptocurrency miners are now responsible for considerable greenhouse gas emissions from dirty energy sources, although using certain clean energy sources. For example, Bitcoin mining activities alone emit roughly 22,862 kilotons of CO₂ into the environment each year. To put this in context, the average yearly CO₂ emissions of a typical passenger vehicle in the United States are 0.0046 kilotons, thus the annual emissions produced by Bitcoin mining are comparable to 4.97 million automobiles.

3.3. Miner consolidation

The second issue that cryptocurrency miners face is miner consolidation and its impact on local communities. The concentration of miners in a few locations throughout the world that share energy and geographic features is an intriguing aspect of the mining revolution. This concentration has resulted in certain advantages for these communities, such as investment by a new high-tech job industry. It has, however, raised new questions about the long-term economic sustainability of cryptocurrency mining, as well as whether miners are taking appropriate electrical safety precautions. The recent trend of miner consolidation is due to a number of causes, the most notable of which being the availability of inexpensive power. Because cryptocurrency mining consumes so much energy, the price of power is sometimes a decisive factor in whether or not miners earn a profit. There is legitimate worry in the areas that have witnessed a particularly high level of miner consolidation regarding the long-term economic viability of mining and the impact on their community if mining operations fail. This worry is based on two signs that the mining industry's economic fundamentals are deteriorating. First, there is a good chance that bitcoin mining will be an economic bubble. There is evidence that these price swings have been driven by market speculation rather than bitcoin economic fundamentals such as supply and demand.

3.4. Encryption security

Another issue that the business is dealing with is the security of bitcoin encryption. The cryptocurrency system looks to be safe from electronic attacks at the moment since it employs PKI to encrypt transactions and user currency accounts. However, a new form of computer known as a "quantum computer" is now being studied. A quantum computer, on the other hand, uses qubits (quantum bits) rather than switches. As a result, quantum computers can handle orders of magnitude more data and information than ordinary binary computers. This rise in computer speeds is expected to be sufficient to enable determining the alphanumeric private keys of another possible, therefore jeopardizing the security of the entire cryptocurrency system.

Concerns regarding the long-term economic sustainability of cryptocurrency mining may have an impact on miners as well as mining communities. Cryptocurrency mining generates money by awarding new coins in return for validating a block of transactions. As a result, miners want the cryptocurrency's

price to be constantly high enough to pay their expenditures. There has been no continuity. In the previous two years, the market value of cryptocurrency has reached \$100 billion. Since of this instability, cryptocurrency mining is a hazardous venture because if a down period lasts too long, most miners will be unable to fulfill their expenditures.

4. Discussion

4.1. Future of Cryptocurrency: Android Cryptocurrency Mining on Pi Network

To solve the challenges of the traditional virtual currencies, innovative projects like Pi Network, Bee Network among others are believed to solve the significant challenges associated with the traditional or current cryptocurrencies. The Pi Cryptocurrencies Network is one of the latest projects in the virtual currency industry that is described as a social type of cryptocurrency that was developed by PhDs from Stanford and Cryptocurrency graduates at Stanford: (1) Dr. Nicolas Kokkalis, (2) Chengdiao Fan and (3) Vince Mc Phillips. The founders of Pi Network all say that unlike other virtual currencies, Pi Network is very easy to use and lightweight. Moreover, Pi Network is uniquely designed to be operated with the help of mobile smart phones.

Pi Network project was originally launched on March 14th in 2019 and the core team behind the implementation of this future cryptocurrencies claimed that this global project has currently over 21 million users on planet earth and it is applicable in about 180 different nations across the globe. Its rapidly growing popularity is attributed to Pi Network's ease in accessibility because unlike Bitcoin, which requires sophisticated computer appliances, Pi Network only requires an Android or Apple Smart phone to start mining. The future of cryptocurrencies will be dictated by innovative projects like Pi Network, Bee Network and other future cryptocurrencies which are digital currencies that aim to keep crypto mining accessible and address the challenges of the current cryptocurrencies.



Figure 2. Showing Pi Network mining using Android smart mobile phone application.

4.2. *Pi Network and the future of Virtual Currencies*

Pi Network has taken a totally different direction or approach in its development when compared to other traditional cryptocurrencies like Bitcoin, Ethereum among others. For the case of Pi Network, the core team has developed an innovative "ultra-low" blockchain technology network that allows users to maintain it using their android smart mobile phones. Pi Network which is a new virtual currency project was officially launched by a group of Stanford's professors and graduates and it is a unique futuristic cryptocurrency that is created to rely on different techniques towards securing and enforcing the Blockchain network (Marinof, 2019).

The new Pi Network mainly comprises of secured "security circles" which are strategic groups of networks that mainly consists of various users who have been successful in vouching for other users or peers on the network. Ideally, once a particular user is believed to be trustworthy or deemed as best fit by other members of a certain group, then the users are allowed to enter and validate their future Pi transactions on the blockchain network. Moreover, the Pi Network users may also significantly mine their new Pi tokens directly with the help of their smart mobile phones which is currently one of the efficient and low-cost processes of mining cryptocurrencies in the entire world. Additionally, mining Pi cryptocurrency also requires minimal phone battery power and the viability of the project may be seen from the 21 million users who are active on the Pi Network (Marinof, 2019).

However, it is important to note that Pi Network is not the only cryptocurrency project that is evaluating or exploring the opportunity of solving the current cryptocurrency challenges by using smartphones to mine cryptocurrency, Electroneum cryptocurrency is another cryptocurrency from Britain that was successfully launched in the year 2017. Similar to Pi Network, Electroneum nasals very light-weight the users are able to run or operate it using their Android smartphones. Moreover, Electroneum has also seen significant acceptance and growth in continents like Asia and Africa. Ideally, since it's official launch, Electroneum has managed to record about 4.3 million active miners on the blockchain network but despite innovative and creative projects like Pi Network, Bee Network, Electroneum among other networks, they actually do not stop other cryptocurrencies like Ethereum and Bitcoin from polluting the environment through its unsustainable mining technologies that require high energy requirements (Marinof, 2019).

Financial experts believe that Pi Network 's security circles initiative is what makes it to be so secure when compared to other cryptocurrencies like Bitcoin and Ethereum. This is due to the fact that Pi Network is very safe and the funds that will be transacted on the network will also be very safe since users are ide tooled and selected through a merit analysis and evaluation process to be included in the social circle. Therefore, the core foundation of establishing one's social circle is trust and the ability of the members in the social circle to become available to another member in the social circle. Additionally, members in one's social circle are those who have also shown significant willingness or those who have admitted that they will religiously focus on adhering to the regulations dictated by social network to enforce the level of network security (Marinof, 2019)

Consequently, members of the Pi Network also have the ability of mining other new tokens directly using their mobile smart phones which is believed to be a relatively low-overhead activity that requires low battery power. As stipulated in Pi Network's operational whiteboard, after new members have recorded about three different mining sessions, they are allowed to start building their own independent security group or circle which is mainly composed of about five different members that all of the miner's trust. This might go a long way in reducing the level of fraudulent activities and transactions on the platform (Marinof, 2019).

Currently, Pi is in its beta development stage or phase and at this level, all of the members in the Pi blockchain network are only required to launch the app on their smart phones and to mine the cryptocurrency one daily basis. This will go a long way in helping the core team to successfully transcend into main net and surpass the challenges of test net. The Pi Network core team are also designing appropriate mechanisms and systems that will help in ensuring that everyone has something to stake when they are vouching for others to successfully gain access to the Pi Network Cryptocurrency (Marinof, 2019).

5. Conclusion

To summarize, cryptocurrency mining must not only lower its total energy consumption, but it must also strive to guarantee that the energy it does use comes from clean energy sources that minimize greenhouse gas emissions.

If cryptocurrencies cause an economic bubble, it will have substantial economic repercussions for communities where bitcoin miners have become a significant part of the local economy.

Because cryptocurrencies are totally electronic and decentralized by definition, any redress after an assault will be nearly difficult. As a result, it would be advisable to take precautionary measures now to safeguard bitcoin and cryptocurrency mining from any future encryption difficulties.

If the role of cryptocurrencies in the global economy is to expand, market volatility must be handled to guarantee that a key component of any cryptocurrency, miners, is sustainable.

References

- [1] Killian Steer., (2019). Cryptocurrency Mining: The Challenges It Faces and How Regulations Can Help, 20 N.C. J.L. & Tech. 301. Retrieved from: <https://scholarship.law.unc.edu/ncjolt/vol20/iss5/9>
- [2] Lambert, L & Hacket, R., (2021). Bitcoin, Ethereum, Dogecoin: Witness the trillion-dollar crypto carnage—and rebound—in 3 charts. Retrieved from <https://fortune.com/2021/05/20/crypto-bitcoin-ethereum-dogecoin-market-crash-trillion-dollar-charts/>
- [3] Marinof, N., (2019). Pi Network seeks to offset the environmental damage done by Bitcoin mining: Yahoo Finance. Retrieved from <https://finance.yahoo.com/news/pi-network-seeks-offset-environmental-194813491.html>