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Environmental and economic impact of Bitcoin Mining

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Abstract

The digital currency Bitcoin gained prominence in the aftermaths of worldwide financial crisis when people experienced an attrition of trust. Bitcoin being a decentralized currency is not under the have power over any institution or government as other fiat currencies are when effecting a transaction through blockchain technology. As there is a scarcity of analysis of the impact of bitcoin's energy consumption and its impact on the environment; a detailed study regarding this will shed some light on the mining of bitcoin, energy required for mining it, how sustainable bitcoin mining is, how this energy is produced in mining bitcoin, and its impact on environment and energy required to cool the hardware or the power-hungry machines which are involved in mining the famous bitcoin. The topic Environmental and Economic Impact of Bitcoin Mining accentuates the implications and challenges that bitcoin faces in an economic environment and beyond. This topic serves as a touchstone for getting a deeper insight relating to the environmental impact the bitcoin has on the environment.

Keywords: Bitcoin, environment and economy

Introduction

Bitcoin is regarded as a digital cryptocurrency that has elicited substantial public interest. It's a peer-to-peer cryptocurrency which is mainly used for monetary transactions on the internet and is designed to be similar to fiat currency. Bitcoin is used on a peer-to-peer network within the internet. What distinguishes this cryptocurrency from the currency is that bitcoins are not issued or governed by a central authority like the central bank of any country (RBI in case of India) but are created in a process called mining. Mining is one of the key concepts behind the bitcoin protocol in which suitable transactions are stored into blocks and are added to the ledger by linking it to the previously accepted blocks. This in turn creates an interconnected structure called blockchain of which transactions have taken place upsetting users from reusing bitcoins and attempting to spend them more than once.

The digital currency Bitcoin gained prominence in the aftermaths of worldwide financial crisis when people experienced an attrition of trust. Bitcoin being a decentralized currency is not under the have power over any institution or government as other fiat currencies are when effecting a transaction through blockchain technology. Due to highly volatile environment and open to speculative use as it lures users and investors (because of its decentralized nature). There consists plethora of opinions on bitcoin pertaining to its optimistic and pessimistic views. But as a matter of fact bitcoin's disadvantages outnumber its advantages. It lacks a explicit center it could cause a lunacy financially, leading to an environmental damage due to energy it consumes. As there is a scarcity of analysis of the impact of bitcoin's energy consumption and its impact on the environment; a detailed study regarding this will shed some light on the mining of bitcoin, energy required for mining it, how sustainable bitcoin mining is, how this energy is produced in mining bitcoin, and its impact on environment and energy required to cool the hardware or the power-hungry machines which are involved in mining the famous bitcoin.

Why this is necessary? The humongous levels of energy consumption and the fact that this consumption will continue to increase have ramifications. The dependence of nearly 80% of the world's energy consumption on fossil fuels brings a host of problems for the 12 environment. The stratospheric levels that bitcoin's energy consumption will reach are regarded as lynchpin that will finish off limited fossil reserves. Bitcoin mining is undertaken in areas where energy is furnished through the burning of fossil fuels which are already responsible for very poor quality of air in these areas. The energy consumed due to increased bitcoin mining is the most important problem in our study.

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In order to find a more sustainable solution to the problem mentioned above, we will apply those methods that allow us to detect those areas that would be optimal for mining crypto currency (Here in our case Bitcoin) taking into account a number of factors that could contribute to more sustainable mining.

Overview

Bitcoin is a digital asset and a payment mechanism which is used as a form of Internet currency. The mechanism provides for an anonymous payment from one person to another in addition to is therefore a preferred payment method for criminal activities. Many businesses today are expanding their foothold in this sphere of influence which means they have started accepting payments in bitcoin now. Recently, on June 5, El Salvador President Nayib Bukele declared that bitcoin, is the first cryptocurrency, would become legal tender in El Salvador. A few days later the Bitcoin law was passed, to take effect on September 7. Businesses would be required to accept to accept bitcoin for all payments. Bitcoin does not come under the purview of any regulation and the value of a bitcoin fluctuates considerably. Due to absence of any third-party and having a standing of maintaining its anonymity, bitcoin is a preferred tool for illegitimate demeanors especially by web-based criminals. A stereotypic example of bitcoin usage is the use of paying payments to unlock any kind of ransomware. Criminal masterminds exchange bitcoins with each other as payments for services, information, extortion.

History of Bitcoin

It started in the year 1983 an American developed a cryptographic system called eCash. Twelve years later, he developed another system, DigiCash, which used cryptography to make economic transactions confidential.

Who created eCash?

eCash was created by Dr. David Chaum under his company, named DigiCash. Though there was interest in the platform from large banks, eCash never took off and Digi Cash filed for bankruptcy in 1998. DigiCash, along with its eCash patents, was eventually sold off.

Pre-Bitcoin Years 1998-2009

Bitcoin was the first established cryptocurrency. However, there were prior attempts at creating online currencies with ledgers protected by encryption.

Example- B-Money and Bit Gold. These currencies were formulated but never got developed.

The Birth of Bitcoin Year 2008

Bitcoin –A Peer to Peer Electronic Cash System was posted to a mailing list discussion on cryptography. It is said that it was posted by someone named Satoshi Nakamoto, The identity of this man is still a mystery. In the year 2009 The Bitcoin software was made available to the public for the first time The mining – the process through which new Bitcoins are created started which paved way for a new technology called Blockchain.

Bitcoin valued for the first time year 2010

Never been traded till 2010, it was impossible to allocate a monetary value to the units of this emerging cryptocurrency. In the same year, someone decided to sell theirs for the first

time. This was swapping 10,000 Bitcoins for two pizzas. If the buyer had not swapped those Bitcoins for two pizzas, then at today's prices they would be worth more than \$100 million.

Threat of new entrants Year 2011

Bitcoin increases in popularity across the world. The idea of decentralized and encrypted currencies starts catching on. The new and alternative cryptocurrencies appear in the market. The first ones to emerge were Namecoin and Litecoin. However, currently there are over 1,000 cryptocurrencies in circulation with new ones frequently appearing. Well even India is not behind. Do you know the made in India crypto??? Made-in-India crypto Polygon is now among the top 20 crypto coins traded globally.

Bitcoin price crashes Year 2013

Soon after the price of one Bitcoin records a high \$1,000 for the first time, it quickly begins to decline. The investors at that point suffered losses as the price tumble down to around \$300. The recovery of Bitcoin price was very slow in these years.

The year of Scams and theft 2014

Bitcoin proved to be an eye-catching and profitable target for criminals. In January 2014, the world's largest Bitcoin exchange Mt. Gox went offline, and the owners of 850,000 Bitcoins never saw them again. The Investigations are still trying to get to the bottom of exactly what and how it happened. It is believed that someone dishonestly got their hands on the coins which at the time were valued at \$450 million dollars. At today's prices, those missing coins would be worth more than \$4.4 billion.

Ethereum and Initial Coin Offerings Year 2016.

AS the enthusiasm behind crypto currency grew, Ethereum arrived with ICO's. This platform offered investors a chance to trade cryptocurrencies just like stocks and shares. The US Securities and Exchange Commission warned investors that these could be scams or ponzi schemes often disguised as legitimate investments. In September 2017, China banned Initial Coin Offerings (ICOs) in a bid to protect investors and curb financial risks. The ICO rules also banned cryptocurrency trading platforms from converting legal tender into cryptocurrencies and vice versa.

The rise of Bitcoin Year 2017

The fifth price bubble occurred in 2017. Bitcoin was hovering around the \$1,000 price range at the beginning of the year. After a period of short decline in the first two months, the price witnessed a remarkable ascent from \$975.70 on March 25 to \$20,089 on December 17.

This year placed Bitcoin firmly in the mainstream spotlight. The Governments and economists took notice of the same and began developing digital currencies in order to compete with Bitcoin. Several analysts started debating its value as an asset and investors made extreme price forecasts. A gradual increase in the price of Bitcoin drew attention banks such as Citi Bank, Barclays, Deutsche started investigating ways to work with Bitcoin. The technology behind Bitcoin-blockchain strikes a revolution in the financial industry across the world.

The Year of Pandemic 2020-21

The economy shut down due to the pandemic in 2020, and Bitcoin's price explodes into activity once again. The pandemic shutdown across all nations, and consequent government policies, fed into investors' fears about the worldwide economy which eventually accelerated Bitcoin's rise. The cryptocurrency started the year at \$7,200 and close on November 23, Bitcoin was trading for \$18,353. A continued interest of investors in Bitcoin propelled its price to rise upwards and it recorded a high of \$24,000 in December, 2020. This was an increase of around 224% from the beginning of 2020. However, in January 2021, Bitcoin broke all it recorded and was trading at \$41,258 on Jan 8, 2021. Presently the market is sliding but many suggests that Bitcoin is here to stay. Many educated investors and financial analysts have described Bitcoin as the future of money.

Research Methodology

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability.

Objectives of the study

1. To study about Bitcoin mining.
2. To study about the Environmental and Economic impact of Bitcoin mining

Research Type

The type of research conducted for this research is Descriptive Research.

Research Design

1. **Sampling Size:** Research is based on secondary data so there is no need of sample size.
2. **Sampling Methods:** Convenience sampling is selected for data collection.
3. **Collecting The Data:** In this research paper, secondary data is used to support the research work. In this research paper, the secondary data is collected external sources such as Magazines, Journals, Websites, Newspapers etc.

Results

Economic Impact of Bitcoin

There is a growing debate regarding the nature of cryptocurrencies and their functions in the literature. During ancient times, the coin was made of precious metals, and people trusted its intrinsic value but with the passage of time countries started using fiat money, which is backed by government guarantees. In contrast, in the case of cryptocurrencies, where the value is determined by scientific algorithms and verified by electronic data transfer, all transactions players are anonymous and the guarantee is not offered by any authority. In case of fiat currency, its functions are subject to regulations and if there is a security breach, the parties involved to it will be held liable and the users of fiat currency will receive their due compensation as guaranteed by the governing body. L. Badea, "Cryptocurrency – a new trend in the business world?" On the other hand in case of cryptocurrency, security is mainly of IT nature, the cryptocurrency market being a very

dynamic one and subjected to the influences of plethora of factors. From an economic perspective, there are a number of controversies about what Bitcoin really is and what are its functions. Some treat it as a medium of exchange others as a speculative

investment. How different authors have explained what bitcoin is and how their perspectives differ with that of other authors are stated as: Corbet et al. start from the identification of cryptocurrencies as a financial asset.

A.H. Dyhrberg shows that we can treat Bitcoin from the perspective of gold, which can even be seen as a hybrid between a currency and a commodity. Thus, durability, divisibility, portability, high liquidity and lower transaction costs make it attractive. The European Central Bank considers Bitcoin to be a digital representation of value, which is not issued by a central bank, but can serve as a substitute for banknotes, coins, demand deposits and electronic money.

The acceptance of bitcoin has been increasing due to the involvement of traders, who have accepted the payment of goods and services in cryptocurrency (in this case bitcoin) as shown by Selgin. In U.S. more than 75000 U.S. merchants, including the largest, accepted bitcoin, which was proved to be a preferred medium for foreign remittances from workers abroad. Nowadays, according to specialized sites, as *99bitcoins.com*, one may observe the fact that 36% of small and medium businesses in the United States of America accepted payments with bitcoin in 2020. The same site (www.99bitcoins.com) enumerates among those accepting bitcoin some very wellknown major companies such as: Microsoft, Burger-King, AT&T, Wikipedia, KFC, Pizza Hut, Overstock etc., emphasizing that "today it's possible to buy almost anything with Bitcoin through the use of Bitcoin debit cards", which are issued by Visa or Mastercard. There are other companies also which are accepting payments in bitcoin such as Wordpress.com, Reddit, Dell, Target, Expedia, Bloomberg, PayPal, and Tesla Motors. Dell accepts direct Bitcoin payments, but Amazon instead offers digital gift cards, which can be purchased with Bitcoin and then used to purchase goods from their website.

Environmental Implications of Bitcoin

Cryptocurrencies have emerged as one of the most eye-catching, yet head scratching investments in the world. These cryptocurrencies touch stratospheric heights in their value, they even crash due to unprecedented volatility in the market. Cryptos have the tendencies to displace the conventionally accepted currencies like the dollar, rupee, ruble and renminbi etc. Out of the plethora of cryptocurrencies available in the market, bitcoin, as one of the most widely accepted and popular cryptocurrencies gaining significant foothold in the realms of management, business, education and so on, use astonishing amount of electricity. This is explained in next paragraph. The process of mining bitcoins consumes around 96 terawatt-hours of electricity annually, more than is used by the Philippines, a nation of about 11039 million. That usage which is close to around half a percent usage of all the electricity consumed in the world, has increased about tenfold in the last five years. The bitcoin network uses about the same amount of electricity as Washington state does in a year and more than one-third of what residential cooling in the United States uses up. The electricity consumption of bitcoin mining is

seven times more than that of global operations of the Google.

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Conclusions

The topic Environmental and Economic Impact of Bitcoin Mining accentuates the implications and challenges that bitcoin faces in an economic environment and beyond. This topic serves as a touchstone for getting a deeper insight relating to the environmental impact the bitcoin has on the environment. The negative impact emanating from the bitcoin mining a company this topic is what has been discussed in this topic and sustainable solutions have been suggested for bitcoin mining keeping in view the emissions emanating from the bitcoin mining. From an economic perspective, despite the fact that bitcoin is acknowledged as a method of payment by numerous economic actors, no common denominator has yet been found in terms of its identification as it has not yet been concretely classified as a currency by legislation. However, we must not overlook all of a currency's functions! Individuals have voiced a desire to escape the "magnifying glass" of authority or gain from freedom as currencies similar to bitcoin have developed in a real or virtual environment over time and circulated in parallel with the traditional money sponsored by the state. Often, the competition between the currencies caused them (Virtual currencies) to vanish, with the market keeping only the currency in which people had exhibited the most faith.

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